At-risk readers in French immersion: Early identification and early intervention

Nancy Wise
University of Toronto

Xi Chen
University of Toronto

Authors' Note
We wish to thank Dr. Sharon Lapkin, who generously offered to read earlier versions of this paper. Her insightful comments, helpful suggestions, and positive feedback were much appreciated. We also gratefully acknowledge the efforts of the teachers and the support of the school administration. Finally, we thank the children for their participation in the study.

Abstract
This study analyses the impact of phonological awareness instruction on the reading achievement of at-risk Grade 1 readers enrolled in an early French immersion program. Twenty-nine children from diverse linguistic backgrounds participated in the study. At-risk readers were identified on the basis of text reading performance and phonological awareness test scores, and received 20 weeks of phonological awareness training in small groups. The intervention was initially given in English, and switched to French once students had acquired a foundation in the language. Significant gains were found in the phonological awareness skills of the treatment group. Results also indicated that the end-of-year French reading levels of the treatment group were superior to the comparison group. These findings suggest that a phonologically based intervention can effectively address phonological awareness deficits and facilitate French reading acquisition for early immersion students who are considered to be at risk for later reading difficulties.

Résumé
Cette étude analyse l'impact de l'enseignement par l'éveil de la conscience phonologique sur le rendement en lecture des lecteurs à risque en 1re année du programme d'immersion précoce en français. Vingt-neuf enfants issus de milieux linguistiques variés ont participé à l'étude. Les lecteurs à risque ont été identifiés sur la base des résultats de leur rendement en lecture et des résultats des tests de conscience phonologique, et ont reçu 20 semaines de formation à la conscience phonologique en petits groupes. L'intervention a été initialement donnée en anglais et par la suite en français après que les élèves aient acquis une base dans la langue. Des gains importants ont été trouvés dans les compétences en conscience phonologique du groupe expérimental. Les résultats ont également indiqué qu'à la fin de l'année, les niveaux de lecture en français du groupe expérimental étaient supérieurs à ceux du groupe témoin. Ces résultats suggèrent qu'une intervention au niveau phonologique peut résoudre de façon efficace les déficits en conscience phonologique et faciliter l'acquisition de la lecture en français par les élèves en immersion précoce qui sont considérés comme risquant plus tard d'éprouver des difficultés en lecture.

At-risk readers in French immersion: Early identification and early intervention

Children who enroll in French immersion programs present with varying reading abilities. Immersion educators continually strive to improve instruction in order to accommodate as many children as possible, so that they will be afforded the advantages of bilingualism. Nevertheless, the system often fails to meet the needs of a small percentage of students who have difficulty learning to read (MacCoubrey, 2003). Children who struggle to acquire reading skills almost invariably remain poor readers in later years (Stanovich, 1986; Juel, 1988). A recurring cycle ensues: the more frustration these low-achieving readers experience, the more disinterested they become in the reading process. Research suggests that if French immersion teachers identify students who may be at-risk for later reading difficulties early on and intervene while the achievement gap between strong and weak readers is still relatively small, fewer students will experience reading failure (MacCoubrey, Wade-Woolley, Klinger, & Kirby, 2004; Geva, 2006; Bournot-Trites, 2008). Few studies have examined the reading development of children enrolled in French immersion programs in Canada, and even less is known about reading acquisition and interventions for struggling readers (Geva & Clifton, 1994; Genesee & Jared, 2008). The purpose of the present study was to investigate the impact of phonological awareness training on the reading development of Grade 1 French immersion students who were identified as showing early signs of difficulty with reading acquisition. Small-group instruction was provided initially in English and later switched to French once students had acquired a foundation in the French language.

Early identification and early intervention for at-risk readers

The French immersion program was initially developed more than 40 years ago in response to parental demands for educational programs which would encourage French-English bilingualism among their children (Lambert & Tucker, 1972). In Canada, most early French immersion programs begin in Senior Kindergarten (SK) or Grade 1 (Halsall, 1998). Distinctions between total and partial immersion are often made, with total immersion characterized by 100% French language instruction during the primary grades, as opposed to 50% French and 50% English instruction in partial immersion programs (Genesee & Jared, 2008). In total French immersion, primary classroom teachers communicate with the students solely in French, which is the language of instruction for all core subjects. English is usually introduced in Grade 3 or 4, starting with one period per day and increasing gradually over time. By Grade 7 or 8, students receive approximately 50% of their instruction in French and the remaining 50% in English (Mannavarayan, 2001). In early total French immersion programs, students acquire French literacy skills before learning to read and write in English or their own first language.

Notwithstanding the abundant evidence suggesting that French immersion schooling is an effective way to promote academic achievement and bilingualism in Canada (e.g., Cummins & Swain, 1986; Genesee, 1987; Turnbull, Lapkin, & Hart, 2001;

Genesee, 2006), not all students experience success in immersion programs (Genesee & Jared, 2008), and not every child who is enrolled remains in the program (Mannavarayan, 2002). Interestingly, assessment of reading risk for early French immersion students is generally not attempted until Grades 2 or 3 (Keep, 1993; MacCoubrey et al., 2004), largely due to the fact that most children who enter the French immersion setting have little background in the French language, and must first acquire listening and speaking skills before formal reading instruction can be introduced. As a result of this delay in the identification process, early French immersion students who may be at-risk for reading difficulties typically do not receive timely instructional interventions (Parkin, Morrison, & Watkin, 1987). In some cases, transfer to the regular English program is the only viable alternative to meet their educational needs (Stern, 1991). Reading difficulties are one of the most important factors influencing parents to transfer their children (Hart, Lapkin, & Swain, 1989; Mannavarayan, 2001), and parental decisions to withdraw their children are typically made prior to the end of Grade 3, estimated to affect up to 33% of students in some school boards (Halsall, 1998).

This relationship between early reading difficulties and attrition from French immersion should concern immersion educators, in light of research evidence which has consistently demonstrated the need for early identification of and early intervention for students who may be at-risk for later reading difficulties (Early Reading Expert Panel, 2003). Vaughn et al. (2003) have suggested that, "because students who do not learn to read in the first and second grades are likely to struggle with reading throughout their lives, effective reading interventions for students early in their educational careers are critical" (p. 301). Early identification and appropriate, timely intervention ensure that the small percentage of children whose needs have not been met by reading instruction in the large-group classroom setting will be provided with explicit and systematic training in small groups. This "response-to-intervention" approach has received a great deal of attention in the reading literature in recent years, and has made an enormous impact on the teaching of reading in elementary schools because it sets children up to succeed rather than waiting for them to fail (Horowitz, 2005; Vellutino, Scanlon, Zhang, & Schatschneider, 2008; Simmons et al., 2008).

First language research suggests that phonological awareness, the insight that words used in spoken language consist of smaller sound units, is one of the best predictors of later reading ability among young children (Adams, 1990; Nicholson, 1997; Snow, Burns, & Griffin, 1998; Stanovich, 2000; Ehri, Nunes, Willows, Schuster, Yaghoub-Zadeh, & Shanahan, 2001). It is a general term referring to sensitivity to sounds at the syllable, onset-rime, and phoneme levels. Phonemic awareness, a component of phonological awareness, involves the ability to identify and manipulate individual sounds in words (National Reading Panel, 2000). A child with phonemic awareness would recognize that the word "box" can be broken down into 4 individual sounds or phonemes, and that these phonemes can be blended to form a word that refers to a container which is typically used to store items. Phonological awareness has been found to develop sequentially (Hodson, 2002), and the ultimate goal of phonological awareness training is phonemic awareness (Robertson & Salter, 2007).

Phonological awareness instruction, especially that which focuses on phonemic awareness, plays a vital role in facilitating reading skills (Expert Panel on Literacy & Numeracy Instruction, 2005). A meta-analysis of 52 studies by the National Reading Panel (2000) shows that phonemic awareness training effectively enhances reading achievement in beginning readers. Furthermore, investigations involving bilingual children have demonstrated that phonological awareness in one language, be it the first or the second language, is strongly associated with phonological awareness and reading achievement in another language (Durgunoğlu, Nagy, & Hancin-Bhatt, 1993; Comeau, Cormier, Grandmaison, & Lacroix, 1999). The National Literacy Panel on Language-Minority Children and Youth found similar results in their review of the literature on second-language reading acquisition (Genesee, Geva, Dressler, & Kamil, 2006; Genesee & Geva, 2006; Dressler & Kamil, 2006). Due to this cross-language transfer, it is possible to assess reading difficulties and subsequently provide phonological awareness training in English for children enrolled in French immersion programs.

English phonological awareness has been shown to be a strong predictor of children's reading success in French immersion programs. Comeau et al. (1999) reported that for French immersion children in Grades 1, 3, and 5, English phonological awareness was significantly related to reading achievement in both English and French a year later. In particular, two studies examined this relationship in young French immersion children. MacCoubrey et al. (2004) found that English measures of phoneme blending and sound isolation taken in Grade 1 predicted reading achievement levels a year later in both French and English. Endler (2008) observed that English phoneme deletion tasks administered during Senior Kindergarten (SK) were robust predictors of French word reading ability in Grade 1. These findings indicate that it is not necessary to delay assessment of reading risk in French immersion programs because children have inadequate French oral proficiency at the beginning of the school year. Rather than waiting until French oral proficiency is acquired, student performance on English phonological awareness tests can be examined to identify at-risk readers.

Despite the paucity of empirical evidence suggesting effects of phonologically based interventions on the acquisition of reading skills in French immersion settings, one study is noteworthy. MacCoubrey (2003) examined early intervention for at-risk readers in the French immersion context. The at-risk readers in this study were enrolled in SK classes. They read fewer than 2 words in English and scored at or below the 40th percentile on English measures of phonological awareness and letter knowledge. The treatment group (n = 26) was provided with 12 weeks of phonemic awareness training in French, while the comparison group (n = 23) was engaged in French vocabulary building activities for that same period. The training sessions focused upon phoneme segmentation and blending, in combination with letter-sound activities. The intervention significantly improved at-risk readers' phonological awareness skills in both French and English. No effect, however, was observed in French word reading ability. According to MacCoubrey (2003), one possible explanation for this finding was that the children had not yet been introduced to formal literacy instruction in the classroom setting. It was suggested that

Grade 1 students would be ideal participants for further investigations, as they receive daily reading instruction in accordance with curriculum expectations.

The purpose of the present study was to examine the effects of a systematic and explicit phonological awareness intervention on at-risk readers entering Grade 1 French immersion. Given the participants' lack of French language proficiency at the beginning of Grade 1, the intervention was initially given in English, and switched to French once students had acquired a foundation in the language. Based on the overwhelming evidence in support of early identification and intervention for at-risk readers (e.g., National Reading Panel, 2000), we anticipated that this phonological awareness training would improve at-risk readers' French reading achievement.

Method

Participants

Participants included 29 Grade 1 at-risk readers (13 male, 16 female) enrolled in a public, single-track French immersion elementary school in a middle- to upper-middle-class neighbourhood in southern Ontario. These students were identified as being at-risk for later reading difficulties using a procedure described in detail below. The treatment group originally comprised 17 Grade 1 students. Two students transferred to the regular English program; consequently, end-of-year data was only available for 15 students (7 male and 8 female). The comparison group comprised 14 Grade 1 students (6 male and 8 female), who were enrolled in the same program during the previous school year. At the beginning of the school year, the mean age of the treatment group was 6 years 0 months, and the mean age of the comparison group was 6 years 2 months. Seventy-six percent of the at-risk readers (12 in the treatment group and 10 in the comparison group) were exposed to a language in addition to English at home. Most of these children were born in Canada. Informal observation suggested that all of the non-native speakers of English had acquired conversational proficiency in English.

Because the at-risk readers in the treatment and the comparison groups were enrolled in two different school years, we also examined the reading levels of the typically developing children in these two years to separate the effects of the intervention from possible cohort effects. Seventy-two typically developing readers (30 male, 42 female) were enrolled in the same year as the at-risk readers in the treatment group, and 74 typically developing readers (28 male, 46 female) were enrolled in the same year as the at-risk readers in the comparison group. The mean ages for both typically developing groups were 6 years 2 months at the beginning of the school year.

Identification of at-risk readers

The students in the treatment group were identified as being at-risk for later reading difficulties using a two-tiered identification process. First, as part of a Board-wide data collection procedure, all SK students were individually assessed by their classroom teachers at the end of the school year using an English reading assessment, the PM

Benchmark Kit (Nelley & Smith, 2001). This test required children to read selected texts aloud as the teacher documented observable reading behaviors. Following reading, children were encouraged to retell the story and respond orally to 4 prepared comprehension questions. Students who were not enrolled in our feeder schools were individually assessed by the first author. Using success criteria issued by the Board, any SK child who scored at or below a Level 3 on the PM Benchmark Kit (Nelley & Smith, 2001) was considered to be at risk.

Each child in the treatment group who had not met the SK reading expectations (e.g., having scored at or below a Level 3) was individually assessed in English by the first author at the start of Grade 1 using The Phonological Awareness Test 2 (PAT 2) (Robertson & Salter, 2007). The purpose of this follow-up assessment was to verify that those students who had been identified as at-risk readers on a screening measure involving both word reading and text comprehension were, in fact, struggling to acquire phonological awareness skills. The children in the comparison group had also scored at or below a Level 3 on the PM Benchmark Kit but were not screened further due to limitations in the screening phase of the study.

The PAT 2 test consists of six subtests, measuring rhyming, segmentation, isolation, deletion, substitution, and blending. The rhyming subtest contains rime awareness items only. The isolation and substitution subtests contain phoneme awareness items only. The other three subtests contain a combination of word, syllable, and phoneme awareness items. The maximum raw score is 130. Following MacCoubrey (2003), we considered students who scored at or below the 40th percentile to be at risk for reading difficulty.

During the final week of the fall term, classroom teachers confirmed that the students in the treatment and comparison groups were having difficulty acquiring early reading skills. Early signs of reading problems were evident on individual diagnostic tests that were administered by their teachers during the fall for programming purposes. In our investigation, the comparison group received regular instruction in the classroom setting and the treatment group received a 20-week phonological awareness intervention on a withdrawal basis.

The intervention

The at-risk readers in the treatment group were randomly divided into groups of three, a size considered effective for students requiring reading interventions (Vaughn et al., 2003). During designated language periods, these groups of students were withdrawn to a small room adjacent to their classrooms where instruction was delivered for 25 minutes every other day. Beginning at the end of September, the first author provided the students with phonological awareness instruction in English for 10 weeks. This initial phase of the intervention was immediately followed by phonological awareness instruction in French for another 10 weeks. The teaching staff was confident that after four consecutive months of French instruction in the immersion context, their students would benefit from phonological awareness instruction in French. Moreover, it was

critically important to school administration that as much instruction as possible be conducted in French. In total, the treatment group received approximately 20 hours of instruction, a period of time which is considered to be effective for facilitating reading achievement (National Reading Panel, 2000). Post-testing commenced at the end of March, at the conclusion of the treatment phase.

The intervention was designed to increase the students' phonological awareness skills in an explicit and systematic manner, given the research suggesting that these skills tend to develop in a particular sequence in young children (Hodson, 2002). Children learned to recognize that sentences are made up of words, words are made up of syllables, and syllables are made up of individual sounds or phonemes. This progression encouraged the children to become cognizant of increasingly smaller units of speech and eventually to produce and manipulate them. Activities at the word, syllable, and phoneme level were based upon vocabulary taken directly from stories which were read aloud. A new text was introduced each week, and instruction proceeded in a sequential manner. English and French sessions followed a similar format. The scope and sequence for the early intervention program are presented in Appendix A, and a sample lesson is presented in Appendix B.

Outcome measures

Following the 20-week instructional period, the first author re-administered The PAT 2 individually to students in the treatment group. At the end of Grade 1, two reading outcomes were obtained to compare the two group's reading achievement levels. These outcomes included scores on a French reading assessment and French reading marks on provincial report cards.

French reading assessment.

This Ontario School Board required its primary French immersion classroom teachers to administer a French reading assessment, Alpha-jeunes (Barrett, Littleford, & Watson, 2004), to all of their students during the spring term, approximately one month following the completion of the intervention. Its administration is similar to that of the PM Benchmark Kit (Nelley & Smith, 2001). To begin, Grade 1 teachers identify an appropriate entry level for each child in their class based upon previous school records. The student is asked to read the selected text aloud as the teacher records observable indicators of reading behavior. Following reading, children are encouraged to respond orally to 4 prepared comprehension questions which tap both literal and inferential understanding. The instructional reading level is identified if the oral reading accuracy level is between 90% and 95% and the student correctly responds to all of the questions. Otherwise, the teacher repeats the steps with more difficult or easier texts depending on the student's performance until an instructional reading level is established.

Report cards.

End-of-year provincial report cards provided additional evidence of students'

reading achievement levels. These evaluations were based upon teacher averaging of individual student performance on daily class work, as well as on summative assessments which were administered periodically throughout the final term. Both daily work and summative assessments measured students' ability to demonstrate reading skills specified in the Ontario Grade 1 curriculum expectations (e.g., letter-sound correspondence, word recognition, decoding skills, reading comprehension). We converted letter grades to numerical values to compare group means following the guidelines of the Ontario Ministry of Education and Training (1998). During the two years, the same four classroom teachers were responsible for end-of-year student evaluations.

Results

Table 1 displays the treatment group's performance on the PAT 2, including the total score and the scores of the six subtests, before and after the intervention. To evaluate these children's progress on syllable and phoneme awareness, we also calculated the total scores on these two aspects of phonological awareness by adding up items of each type from different subtests. The rhyming subtest is the only subtest containing rhyming items, and so the subtest score represents the children's performance on rime awareness. The percentile ranks for the whole test as well as the six subtests are presented in Table 2. One female student in the treatment group was removed as an outlier. This student scored more than two standard deviations below the mean on PAT 2 total and most of the subtests at the pretest, but her post-test scores were in the normal range in the treatment group, and so the reason for the low performance at the pretest seems to be that she did not understand the test instructions. The PAT 2 data were available for the treatment group only because the comparison group was not administered this test.

Table 1
Means (Standard Deviations) of PAT 2 Raw Scores of the Treatment Group

PAT 2	Pretest Score	Posttest Score	t (13)	*p*	*Cohen's d*
PAT 2 Total (130)	65.21(12.76)	102.43 (7.06)	14.71	.000	3.91
Segmentation (30)	13.93 (4.36)	22.86 (2.21)	6.83	.000	2.68
Isolation (30)	15.07 (5.41)	25.14 (2.85)	9.14	.000	2.42
Deletion (20)	9.00 (4.06)	15.07 (2.30)	4.75	.000	1.91
Substitution (10)	2.79 (2.15)	3.86 (2.32)	1.30	.215	.5
Blending (20)	10.43 (1.74)	17.14 (2.32)	12.01	.000	3.4
Syllable (30)	19.50 (3.46)	25.29 (1.86)	5.84	.000	2.16
Rhyming (20)	14.00 (5.38)	18.36 (2.76)	3.95	.002	1.06
Phoneme (70)	25.36 (9.44)	49.57 (5.71)	12.81	.000	3.22

Table 2
Means (Standard Deviations) of PAT 2 Percentile Ranks of the Treatment Group

PAT 2	Pretest Percentile	Posttest Percentile
PAT 2 Percentile	.26 (.13)	.65 (.13)
Rhyming	.44 (.31)	.66 (.21)
Segmentation	.28 (.19)	.67 (.14)
Isolation	.33 (.23)	.66 (.20)
Deletion	.37 (.25)	.68 (.17)
Substitution	.34 (.20)	.35 (.28)
Blending	.21 (.23)	.57 (.21)

As shown in Table 1, raw scores of the whole test and of all the subtests were descriptively higher at the post-test than at the pretest. Most tests also had a smaller standard deviation at the post-test. Multiple t-tests were carried out to examine the treatment effect. To safeguard against Type I error rate inflation, we adjusted the alpha level using the Bonferroni procedure. With 16 t-tests on the same dataset and a mean correlation of .20, the alpha level for each individual test was set to .005 so that the family-wise type I error was smaller than .05 (SISA, 2009). Applying this adjusted alpha, we found that all the t-tests were significant except for the t-tests on the substitution subtest. For all significant tests, the effect sizes (Cohen's d) were large (effect sizes larger than .80 are considered large). In particular, the effect size for the PAT 2 total score was 3.91, and the effect size for phonemic awareness was 3.22. Table 2 shows that children improved in percentile ranks in PAT 2 total and all subtests except for the substitution subtest.

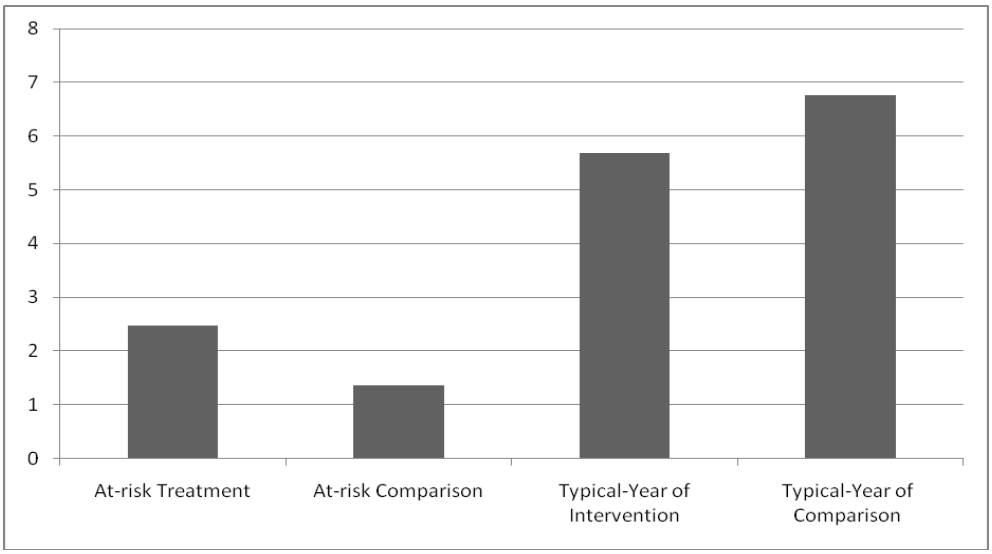
Table 3 contains the descriptive statistics of Alpha-jeunes scores (French reading level) and report card marks for the treatment and comparison groups, as well as their typically developing peers. The at-risk children in the treatment group scored higher than the at-risk children in the comparison group on Alpha-jeunes. The former group also received higher evaluations from their teachers. Interestingly, the typically developing children from the year when the treatment was given lower scores on Alpha-jeunes than the typically developing children from the previous year. The two groups of typically developing children received similar marks on their report cards.

Table 3
Means (Standard Deviations) of Alpha-jeunes Scores and Report Card Marks

Time	Year of Intervention		Previous Year	
Group	At-Risk Treatment	Typically Developing	At-Risk Comparison	Typically Developing
Alpha-jeunes	2.47 (1.85)	5.69 (3.13)	1.36 (.75)	6.77 (2.62)
Report Card	66.40 (5.71)	76.65 (7.10)	57.50 (6.06)	76.35 (4.82)

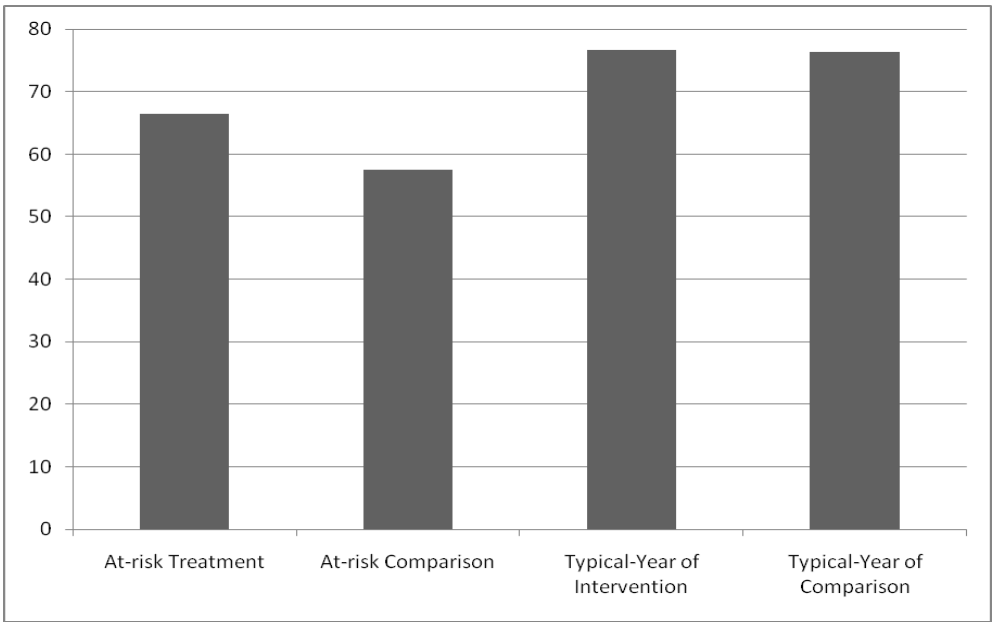
A 2 (Reading level: at risk vs. typically developing) x 2 (Year: Year 1 vs. Year 2) ANOVA was carried out to examine the effects of the intervention on children's French reading ability. As expected, the main effect of reading level was significant, $F(1, 174) = 61.65$, $p < .01$, $\eta = 2.65$. The typically developing children scored higher than the at-risk readers. The main effect of enrollment year was not significant. Importantly, the interaction between reading level and time was significant, $F(1, 174) = 3.94$, $p < .05$, $\eta = .023$. Further analysis revealed that the at-risk children in the treatment condition scored significantly higher than the at-risk comparison group, $t(27) = 2.093$, $p < .05$, $d = .81$, while the typically developing children from the year when the treatment was given scored significantly lower than their peers in the previous year, $t(144) = 2.26$, $p < .05$, $d = 1.43$. These results suggest that the treatment effectively increased at-risk children's French reading ability, despite the fact that the cohort in the treatment year was lower than the cohort in the previous year. The patterns of results are illustrated in Figure 1.

Figure 1. Children's performance on Alpha-jeunes.



A similar 2 x 2 ANOVA was performed on the report card marks. The main effect of reading level was highly significant, $F(1, 174) = 140.98$, $p < .001$, $\eta = .452$, with typically developing children receiving higher marks than at-risk children. The main effect of enrollment year was also significant, $F(1, 174) = 14.09$, $p < .01$, $\eta = .076$. Children in the year of treatment received more favourable marks than children in the previous year. This significant main effect can be explained by the significant interaction between reading level and time, $F(1, 174) = 12.31$, $p < .001$, $\eta = .067$. Further analysis of the interaction showed that the typically developing children in the two years received similar evaluations from the teachers, but the at-risk children in the treatment condition were viewed more positively than the at-risk children in the comparison group, $t(27) = 4.07$, $p < .001$, $d = 1.57$. Thus, receiving the treatment enhanced the report card marks for the at-risk children. The results on report cards are portrayed in Figure 2.

Figure 2. Children's report card marks.



Discussion

Our study provided preliminary evidence that phonological awareness instruction offered in English and French improved English phonological awareness skills for Grade 1 at-risk readers in French immersion. The at-risk readers scored significantly higher on the PAT 2 test and most subtests after the intervention, and they scored significantly higher on all three aspects of phonological awareness. The effect sizes for all significant tests were large, indicating that the treatment was highly effective. Importantly, these students improved not only in raw scores, but also in percentile ranks, which suggests that they made more progress during the same time period than their peers in the normative population. In addition, the standard deviations of the PAT 2 test and most subtests were

smaller at the post-test than at the pretest, indicating that the at-risk readers had become more homogeneous in their phonological awareness levels through the intervention. Thus, our study extended the positive effects of the early intervention reported by MacCoubrey (2003) for SK English-speaking at-risk readers to older students from diverse linguistic backgrounds. Since our at-risk readers were instructed in two languages, first in English and subsequently in French, the improvements attest to the cross-linguistic transfer of phonological processes (Durgunoğlu, Nagy, & Hancin-Bhatt, 1993; Cisero & Royer, 1995; Comeau et al., 1999). Despite the positive findings, our results must be interpreted with caution because the comparison group was not tested on phonological awareness.

Interestingly, the intervention did not increase the at-risk readers' performance on the substitution subtest, a subtest that requires the child to substitute a phoneme in an orally presented word ("This is /k/ /æ / /t/. Now show me how you change cat to bat"). Phoneme substitution was the final skill taught in the continuum, so there was less opportunity for review and practice. Moreover, this skill is considerably more difficult than phoneme blending and segmentation. Blachman (2000) argued that more complex manipulation of phonemes is likely to be the result of, rather than the precursor to, learning to read and spell. It may be more effective to teach complex phoneme judgments together with decoding skills in an intervention program designed for older children (e.g., Wagner et al., 1997).

The early intervention program also had a considerable impact on the reading development of the at-risk Grade 1 students. The French reading achievement levels of the treatment group were significantly higher that those of the comparison group. In fact, the students in the treatment group (mean = 2.47) were approaching the expected reading level for their grade placement, but the comparison group was well below the expected level (mean = 1.36). This difference suggests that the phonological awareness intervention enabled at-risk readers to read more challenging texts with greater accuracy and increased comprehension. These differences between the treatment group and the comparison group were even more compelling when we consider the fact that the typically developing students in the year of treatment actually scored lower than those in the previous year. Thus, the intervention accelerated the literacy development of at-risk readers as compared to their normally developing peers.

Our study is the first to demonstrate that phonological awareness instruction significantly improved the text reading skills of at-risk readers in French immersion. MacCoubrey (2003) sought to establish a link between phonemic awareness instruction and the reading ability of at-risk SK French immersion students; however, no such link was found. One possible explanation for the disparity between MacCoubrey's (2003) findings and those of the present investigation may be that our students were older (in Grade 1) and were receiving formal reading instruction in the classroom on a daily basis. It seems that, as Snow et al. (1998) proposed, simultaneously receiving a phonological awareness intervention and reading instruction leads to sustained gains in reading comprehension over time by reinforcing the connection between spoken and written language.

End-of-year reading marks on provincial report cards provided additional evidence of reading development in the treatment group. A significant difference was found when the June reading marks of the treatment group were compared with those of the previous school year's at-risk readers. This signifies that the treatment group (mean = 66.40) was approaching provincial expectations for reading achievement by the end of Grade 1, whereas the comparison group (mean = 57.50) continued to perform below provincial standards. A careful examination of end-of-year evaluations completed by the classroom teachers clearly indicated that the students who comprised the treatment group were more successful at meeting curriculum expectations in reading.

Our results contributed new evidence to the current knowledge regarding the literacy development of struggling readers in the early French immersion context. In recent years, early intervention opportunities have been found almost exclusively in the regular English program (MacCoubrey et al., 2004). As a result of delayed identification procedures, French immersion students who withdrew from the program at the end of Grade 1 had received little to no supplemental instruction. They often found themselves at a distinct disadvantage when trying to catch up to their peers in reading after switching to the English stream. Our study clearly demonstrates that at-risk readers in French immersion programs are well-positioned to improve their reading skills, having received systematic and explicit phonological awareness instruction. One potential benefit would be a reduction in the attrition rate from immersion programs and an increase in the proportion of bilingual high-school graduates.

One of the strengths of our investigation is that it was designed for a natural school setting and could be easily implemented by teachers in any early immersion program in Canada. The success of our reading intervention was in part due to its emphasis upon rich literacy activities. We linked instruction to popular children's literature so that learning would take place in a more meaningful and authentic manner. A common criticism of the alternative approach which emphasizes scripted, direct instruction of phonological awareness skills in isolation is that it often fails to motivate children. Our "contextualized literacy experiences" (McGee & Richgels, 2000, p. 212) not only provided a context for practice and application of concepts taught, but they also engaged the learners and enhanced the learning experience.

Another strength lies in the languages we chose to deliver the phonological awareness intervention. Our program was initiated in English, a language in which children already had conversational proficiency when they entered Grade 1, and switched to French after 10 weeks once students had acquired a foundation in the target language. Because of this language combination, the intervention could be initiated immediately upon entry into the immersion context with struggling readers who are just developing French oral proficiency, while simultaneously meeting the demands of school staff and administration to maximize the use of French. Our results demonstrate that early identification and early intervention can be used effectively in French immersion programs. Future research should more closely examine what is the most effective way of combining the two languages in the French immersion setting.

The present study also has several limitations. First, the number of at-risk readers in our study was small, which limits the generalizability of the results. Next, the at-risk readers in the treatment group and the comparison group were enrolled in different academic years, and the two groups were compared on French text reading and report card marks only at the end of the school year. As a result, we cannot rule out the possibility that at least some between-group differences observed on these measures resulted from cohort differences. However, the comparison between the typically developing readers from the two years revealed that the cohort from the year of the comparison group was actually stronger than the cohort from the year of the treatment. This difference increases the likelihood that the superior performance of the at-risk readers in the treatment group resulted from the intervention.

In addition, we relied upon report cards and Alpha-jeunes results to evaluate the effectiveness of the phonological awareness intervention. Adding standardized measures of reading would have strengthened our conclusions. Furthermore, our sample consisted of a relatively large percentage of children who spoke a language other than English at home; however, our sample size was too small to allow us to split the sample size into two subgroups. It would be worthwhile to examine the effectiveness of phonological awareness training for at-risk readers from diverse language backgrounds in future investigations.

Finally, the at-risk readers in the comparison group did not receive the phonological awareness test owing to limitations in the screening phase of the study, so we could not compare the treatment and comparison groups on phonological awareness. Over-identification of students in the comparison group may have been the direct result of our reliance on the PM Benchmark Kit (Nelley & Smith, 2001) screening by the SK teachers. However, difficulties with acquisition of early reading skills would have been apparent to SK teachers administering the test during the oral reading component of the test. Because of these limitations, our study needs to be replicated by future studies with more rigorous designs.

In sum, our research demonstrates that supplemental instruction of sufficient duration and intensity for those who may be at-risk for later reading difficulties, provided early in their educational careers in small group settings, may be the key to breaking the cycle of failure. Research has suggested that retention of at-risk readers in French immersion programs should not be an issue if evidence-based instructional interventions are provided early on (Cummins, 1984; Genesee, 2007). It is possible that with appropriate support, these students will become fluent, proficient readers in French and English. This intervention study represents an initial step towards the realization of that goal. Longitudinal studies that are currently underway involving students at risk for later reading difficulties (Erdos, Genesee, & Savage, 2006; Jared, 2006) will provide additional insights into the reading development of children enrolled in French immersion programs in Canada.

References

Adams, M. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.

Barrett, J., Littleford, J., & Watson, J. (2004). *Alpha-jeunes*. Markham, Ontario: Scholastic Canada Limited.

Blachman, B. A. (2000). Phonological awareness. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson, and R. Barr (Eds.), *Handbook of reading research* (Vol. III) (pp. 483-502). Mahwah, NJ: Lawrence Erlbaum.

Bournot-Trites, M. (2008). Fostering reading acquisition in French immersion. *Encyclopedia of Language and Literacy Development*. London, Ontario: Canadian Language and Literacy Research Network (pp. 1-8). Retrieved from: http://www.literacyencyclopedia.ca/pdfs/topic.php?topId=240.

Cisero, C.A., & Royer, J.M. (1995). The development and cross-language transfer of phonological awareness. *Contemporary Educational Psychology, 20*, 275-303.

Comeau, L., Cormier, P., Grandmaison, E., & Lacroix, D. (1999). A longitudinal study of phonological processing skills in children learning to read in a second language. *Journal of Educational Psychology*, *91*, 29-43.

Cummins, J. (1984). *Bilingualism and special education: Issues in assessment and pedagogy*. Clevedon, UK: Multilingual Matters.

Cummins, J., & Swain, M. (1986). *Bilingualism in education: Aspects of theory, research, and practice*. New York: Longman.

Dressler, C., & Kamil, M. (2006). First- and second-language literacy. In D. August & T. Shanahan (Eds.), *Developing Literacy in Second-Language Learners: A Report of the National Literacy Panel on Minority-Language Children and Youth* (pp. 197-238). Mahwah, NJ: Lawrence Erlbaum.

Durgunoğlu, A. Y., Nagy, W. E., & Hancin-Bhatt, B. J. (1993). Cross-language transfer of phonological awareness. *Journal of Educational Psychology, 85*, 453-465.

Early Reading Expert Panel. (2003). *Early reading strategy: The report of the expert panel on early reading in Ontario*. Toronto: Ontario Ministry of Education.

Ehri, L. C., Nunes, S. R., Willows, D. M., Schuster, B. V., Yaghoub-Zadeh, Z., & Shanahan, T. (2001). Phonemic awareness instruction helps children learn to read: Evidence from the national reading panel's meta-analysis. *Reading Research Quarterly*, *36*, 250-287.

Endler, M. (2008). *Predictors of early reading in a second language: The transfer of phonological processing skills and the implications for French immersion.* (Unpublished doctoral dissertation). Ontario Institute for Studies in Education of the University of Toronto, Ontario, Canada.

Erdos, C., Genesee, F., & Savage, R. (2006, March). *Individual differences in language and literacy outcomes in L1 and L2 programs*. Presentation to the Learning Associates, Montreal.

Expert Panel on Literacy and Numeracy Instruction for Students with Special Education Needs. (2005). *Education for all: The report of the expert panel on literacy and numeracy instruction for students with special education needs, Kindergarten to Grade 6.* Toronto: Ontario Ministry of Education.

Genesee, F. (2007). French immersion and at-risk students: A review of research evidence. *The Canadian Modern Language Review, 63,* 655-688.

Genesee, F. (2006). What do we know about bilingual education for majority-language students? In T. K. Bhatia & W. C. Ritchie (Eds.), *The Handbook of Bilingualism* (pp. 547-576), Malden, MA: Blackwell.

Genesee, F. (1987). *Learning through two languages: Studies of immersion and bilingual education*. Rowley, MA: Newbury House.

Genesee, F., & Geva, E. (2006). Cross-linguistic relationships in working memory, phonological processes, and oral language. In D. August & T. Shanahan (Eds.), *Developing Literacy in Second-Language Learners: A Report of the National Literacy Panel on Minority-Language Children and Youth* (pp. 175-183). Mahwah, NJ: Lawrence Erlbaum.

Genesee, F., Geva, E., Dressler, C., & Kamil, M. L. (2006). Synthesis: Cross-linguistic relationships. In D. August & T. Shanahan (Eds.), *Developing Literacy in Second-Language Learners: A Report of the National Literacy Panel on Minority-Language Children and Youth* (pp. 153-174). Mahwah, NJ: Lawrence Erlbaum.

Genesee, F., & Jared, D. (2008). Literacy development in early French immersion programs. *Canadian Psychology, 49*, 140-147.

Geva, E. (2006). Learning to read in a second language: Research, implications, and recommendations for services. In R. E. Tremblay, R. G. Barr, & R. DeV. Peters (Eds.), *Encyclopedia on Early Childhood Development* (pp. 1-12). Montreal, Quebec: Centre of Excellence for Early Childhood Development. Retrieved from: http://www.child-encyclopedia.com/documents/GevaANGxp.pdf.

Geva, E., & Clifton, S. (1994). The development of first and second language reading skills in early French immersion. *The Canadian Modern Language Review, 50*, 646-667.

Halsall, N. (1998). *French immersion: The success story told by research*. Edmonton, AB: Alberta School Boards Association for Bilingual Education.

Hart, D., Lapkin, S., & Swain, M. (1989). *Early and middle French immersion programs: Report on the Substudy of Attrition*. Ontario Institute for Studies in Education of the University of Toronto, Ontario, Canada.

Hodson, B. W. (2002). *Assessing and enhancing phonological/metaphonological skills*. Paper presented at a meeting of the Illinois Speech-Language-Hearing Association. Chicago, Illinois.

Horowitz, S. H. (2005). *Response to intervention: Tiers without tears*. Washington, DC: National Center for Learning Disabilities.

Jared, D. (2006, June). *Becoming biliterate: A longitudinal investigation of reading growth in children in French immersion*. Paper presented at the Conference of the Canadian Language and Literacy Research Network, Charlottetown, PEI.

Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology*, *80*, 437-447.

Keep, L. (1993). *French immersion attrition: Implications for model building* (Unpublished doctoral dissertation). University of Alberta, Edmonton, Canada.

Kimel, E. A. (1993). *The Gingerbread Man*. New York: Holiday House.

Lambert, W.E., & Tucker, G.R. (1972). *Bilingual education of children: The St. Lambert experiment*. Rowley, MA: Newbury House.

MacCoubrey, S. J. (2003). *A phonemic awareness intervention for at-risk second language readers in French immersion* (Unpublished master's thesis). Queen's University, Ontario, Canada.

MacCoubrey, S. J., Wade-Woolley, L., Klinger, D., & Kirby, J. R. (2004). Early identification of at-risk L2 readers. *The Canadian Modern Language Review*, *61*, 11-28.

Mannavarayan, J. (2002). *The French immersion debate: French for all or all for French*? Calgary, Alberta: Detselig Enterprises Limited.

Mannavarayan, J. (2001). *Revisiting why some students struggle in immersion: An expanded review of the literature* (Unpublished master's thesis). Simon Fraser University, British Columbia, Canada.

McGee, L. M., & Richgels, D. J. (2000). *Literacy's beginnings: Supporting young readers and writers,* 3rd ed. Needham Heights, MA: Allyn & Bacon.

National Reading Panel. (2000). *Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Washington, DC: U.S. Government Printing Office.

Nelley, E., & Smith, A. (2001). *PM benchmark kit*. Scarborough, Ontario: Nelson Thompson Learning.

Nicholson, T. (1997). Closing the gap on reading failure: Social background, phonemic awareness, and learning to read. In B. Blachman (Ed.), *Foundations of reading acquisition and dyslexia: Implications for early intervention* (pp. 381-408). Mahwah, NJ: Lawrence Erlbaum.

Ontario Ministry of Education and Training. (1998). *Guide to the Provincial Report Card, Grades 1-8* (p. 25). Retrieved from: http://www.edu.gov.on.ca

Parkin, M., Morrison, F., & Watkin, G. (1987). *French immersion research relevant to decisions in Ontario*. Toronto, Ontario: Ministry of Education.

Robertson, C., & Salter, W. (2007). *The phonological awareness test 2*. East Moline, Illinois: LinguiSystems, Inc.

Simmons, D. C., Coyne, M. D., Kwok, O., McDonagh, S., Harn, B. A., & Kame'enui, E. J. (2008). Indexing response to intervention: A longitudinal study of reading risk from kindergarten through third grade. *Journal of Learning Disabilities*, *41*, 158-173.

Simple Interactive Statistical Analysis (SISA). Retrieved from: http://www.quantitativeskills.com/sisa/calculations/bonfer.htm

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

Stanovich, K. E. (2000). *Progress in understanding reading: Scientific foundations and new frontiers*. New York, NJ: Guilford Press.

Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Reading Research Quarterly*, *21*, 360-407.

Stern, M. (1991). *The French immersion transfer process: An investigation of children transferring from the French immersion program into the regular English program* (Unpublished doctoral dissertation). University of Toronto, Ontario, Canada.

Turnbull, M., Lapkin, S., & Hart, D. (2001). Grade 3 immersion students' performance in literacy and mathematics: Province-wide results from Ontario (1998-99). *The Canadian Modern Language Review*, *58*, 9-26.

Vaughn, S., Linan-Thompson, S., Kouzekanani, K., Bryant, D., Dickson, S., & Blozis, S. (2003). Reading instruction grouping for students with reading difficulties. *Remedial and Special Education*, *24,* 301-315.

Vellutino, F. R., Scanlon, D. M., Zhang, H., & Schatschneider, C. (2008). Using response to kindergarten and first grade intervention to identify children at-risk for long-term reading difficulties. *Reading and Writing*, *21*, 437-480.

Wagner, R. K., Torgesen, J. K., Rashotte, C. A., Hecht, S. A., Barker, T. A., Burgess, S. R., Donahue, J., & Garon, T. (1997). Changing rations between phonological processing abilities and word-level reading as children develop from beginning to skilled readers: A 5-year longitudinal study. *Developmental Psychology, 33*, 468-479.

Appendix A
Phonological Awareness Intervention Scope & Sequence

Week	Phonological Awareness Goals	Sample Instructions
	Words in sentences	
1	The student will recognize rhyming words when presented with rhyming and non-rhyming pairs.	"*Do these words rhyme: _____ / _____?"*
2	The student will orally produce rhyming words when given a stimulus word.	"*Tell me a word that rhymes with _____*."
3	The student will orally segment sentences into words.	"*Point to*/C*lap one time for each word in this sentence*."
4	The student will orally segment compound words into their root words.	"*Clap one time for each root word in the word _____*."
5	The student will orally blend root words to form compound words.	"*Guess my word, _____ [PAUSE] _____*."
6	The student will isolate first or last root words in compound words.	"*What is the first/last root word in the word _____*?"
7	The student will orally delete root words from compound words.	"*Say _____. Now, say it again, but don't say _____*."
8	Review	
	Syllables in words	
9	The student will orally segment words into syllables.	"*Clap one time for each syllable or word part in the word _____*."

10	The student will identify the number of syllables in words.	"*Place one cube in each Elkonin box, one for each syllable in the word _____. Place them from left to right. Now, count the number of syllables*."
11	The student will orally blend syllables into words.	"*Guess my word, ___ [PAUSE] ___ [PAUSE] ___*."
12	The student will isolate first initial, then final, and lastly medial syllables in words.	"*What is the first/last/middle syllable in the word _____?*"
13	The student will delete first initial, then final, and lastly medial syllables from words.	"*Say _____. Now, say it again, but don't say ___*."
14	Review	
	Phonemes in words	
15	The student will isolate first initial, then final, and lastly medial phonemes in words.	"*What is the first/last/middle sound you hear in the word _____?*"
16	The student will orally segment words into phonemes.	"*Listen as I say this word: ____. Now, listen as I say the word again slowly, one sound at a time: /_/ /_/ /_/. What sounds do you hear when you stretch the word _____*."
17	The student will orally blend phonemes into words.	*"Guess my word: /_/ [PAUSE] /_/ [PAUSE] /_/*."
18	The student will orally delete initial, final, and medial phonemes from words.	"*Say ___. Now, say it again, but don't say /_/*."
19	The student will substitute initial, final, and medial phonemes in words.	"*This word is ____. Show me how you change _____ to _____*."
20	Review	

Appendix B

Sample Lesson

Goal Statement: "Today we are learning to count the number of syllables in words. Syllables are small parts of words."

Example #1: "Listen carefully while I clap the number of syllables in the word *gingerbread*. *Gingerbread* has 3 syllables. Now look closely. I'm going to use these three coloured cubes, one for each syllable as I say the word again slowly." (From left to right, the teacher places a red plastic cube in the first Elkonin box, a green cube in the second box, and a blue cube in the last box, stretching the word as she says it again, one syllable at a time).

Example #2: "Listen carefully while I clap the number of syllables in the word *woman*. *Woman* has 2 syllables. Now look closely. I'm going to use these two coloured cubes, one for each syllable as I say the word again slowly." (From left to right, the teacher places a red plastic cube in the first Elkonin box and a green cube in the last box, stretching the word as she says it again, one syllable at a time).

Example #3: "Listen carefully while I clap the number of syllables in the word *man*. *Man* has only 1 syllable." (Provide a few other examples of one-syllable words).

Introduction to Text: "Now I am going to read aloud *The Gingerbread Man* (Kimel, 1993). When I am finished, we will practice counting the number of syllables in words from the story." (The teacher reads this vocabulary-rich and engaging story aloud to the students).

Guided Practice: "Okay, let's count the number of syllables using words that we heard in the story. The old woman and the old man decorated the gingerbread man with 2 licorice eyes. Let's clap the number of syllables in the word *licorice* together." (The teacher invites the students to clap along with her while saying the word slowly). "*Licorice* has 3 syllables. Let's place the coloured cubes in the boxes as we say the word again slowly." (The teacher places the cubes in the Elkonin boxes from left to right, one for each syllable). "The old woman and the old man also gave the gingerbread man a mouth made of icing. Let's clap the number of syllables in the word *icing* together." (The teacher invites the students to clap along with her while saying the word slowly). "*Icing* has 2 syllables. Let's place the coloured cubes in the boxes as we say the word again slowly." (The teacher places the cubes in the Elkonin boxes from left to right, one for each syllable). "They decorated the gingerbread man with 3 peppermint buttons down the front of his shirt. Let's clap the number of syllables in the word *peppermint* together." (The teacher invites the students to clap along with her while saying the word

slowly). "*Peppermint* has 3 syllables. Let's place the coloured cubes in the boxes as we say the word again slowly." (The teacher places the cubes in the Elkonin boxes from left to right, one for each syllable).

Independent Practice: "Now that we've had a chance to count the number of syllables in words from the story together, let's see if you can clap the number of syllables and place the coloured cubes in boxes from left to right all by yourselves." (The teacher gives individual students the opportunity to demonstrate their understanding of the concept being introduced. Words taken directly from sentences in the text are used, so that children can hear them in context. These could include: table, dough, oven, faster, sow, pigsty, running, dog, doghouse, pasture, horse, cow, river, wondering, fox, friend, hop, tail, carry, safe, swimming, water, hop, rising, back, feet, head, snout, & bite).