## PREDICTORS OF GRADE 3 FRENCH IMMERSION STUDENTS’

READING COMPREHENSION: THE ROLE OF MORPHOLOGICAL AWARENESS, VOCABULARY AND SECOND LANGUAGE CULTURAL KNOWLEDGE
by
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#### Abstract

Research findings point to reading comprehension as an important mediator of academic achievement for French immersion students (Hogan, Catts, \& Little, 2005). This research investigated the best predictors of word reading and reading comprehension in French as a second language in 72 Grade 3 students of an early French immersion programme. The present research is based on Bernhardt's (2005) model of second language reading, which views reading comprehension as an interactive-compensatory process. Four main questions guided this program of study: (1) What is the best predictor of word reading among phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness in Grade 3 French immersion students? (2) What is the best predictor of reading comprehension among phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness in Grade 3 French immersion students? (3) What is the relative role of second language cultural knowledge compared to phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness in Grade 3 French immersion students' reading comprehension? and (4) What do French immersion Grade 3 students perceive as different in a culturally less and more familiar text that affected their reading comprehension and which cultural context do they prefer and why?

Results from hierarchical regression analyses showed that phonological awareness and spelling predicted word reading, whereas morphological awareness predicted reading comprehension of isolated sentences. Reading comprehension of a narrative text with more familiar cultural emphasis was predicted by receptive vocabulary (ÉVIP). Reading comprehension of a narrative text with less familiar cultural emphasis was predicted by second


language cultural knowledge, followed by morphological awareness. However, participants perceived the culturally more familiar passage easier and perceived the culturally less familiar passage as more engaging.

Thus, results from the study appear to confirm that reading is an interactive compensatory process. Several theoretical, pedagogical and programme development implications are drawn from the present research.

Keywords: phonological awareness, spelling, morphological awareness, vocabulary, second language cultural knowledge, word reading, reading comprehension, French immersion.

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## CHAPTER 1: INTRODUCTION

"Every act of comprehension involves one's knowledge of the world as well." (Anderson, Reynolds, Schallert, \& Goetz, 1977, p. 379)

The ability to read fluently and with adequate comprehension is considered a hallmark of skilled reading in first and second languages (Grabe, 2002; Koda, 2005). The idea expressed by the above quote is certainly not new, but it is one worth reflecting upon when considering reading comprehension in a second language. In fact, research indicates that the mature readers acquire meaning from text by analyzing words and sentences against the backdrop of their personal knowledge of the world (Freebody, 2007; OECD, 2007).

In addition, rapid social change linked to globalization and the diversification of society, as well as political change calling for increased levels of bilingualism in Canada, have also created a demand for programs such as French immersion (Cummins, 2000). There are over 300,000 English-speaking students in French immersion programs in Canada (CPF, 2006). In 2007, 41,441 students enrolled in early and late French immersion programs in public schools across British Columbia. Predictions are that enrolment will reach 45,000 students by the year 2010 (CASLT, 2008).

Research findings point to reading comprehension as an important mediator of academic achievement for French immersion students (Hogan et al., 2005). Because reading is such an important mediator of academic achievement, being able to accurately assess the ability to read in French is of paramount importance so students can receive support if needed. There is an everincreasing awareness and interest in the issues related to French immersion reading
comprehension in Canada. Therefore, this research focused on the best predictors ${ }^{1}$ of word reading and reading comprehension in French as a second language in the context of French immersion.

### 1.1 French Immersion Context

The term immersion education came to prominence in Canada during the 1960s.
"In 1965, some 23 years prior to the Official Languages Act, Canada pioneered innovative second language education programs to promote the acquisition of Canada's two official languages. French immersion programs were first introduced in Canadian schools in the Quebec community of St-Lambert. The goals of this programme were to provide Anglophone children residing in Quebec with enhanced and extended opportunities to become bilingual in English and French within the context of public schooling." (Genesee, 2006, p. 1)

In British Columbia, French immersion has been part of the public education system since its introduction in 1968. In the present context, French immersion designs a situation where children of diverse linguistic and cultural milieu, who do not have any prior contact with the French language, are placed together in the same classroom where the second language, French, is the language of instruction. The language of instruction in French immersion schools in British Columbia is exclusively in French until Grade 3, although the mother tongue of the students is English or other languages. After Grade 3, classes are usually taught in French 50\% of the time and in English 50\% of the time except in some cases where the ratio is $80 \%$ in French and 20\% in English. Furthermore, the goal of the French immersion programme is "to have children be functionally competent in oral and written French (...) develop in them an attitude of understanding and respect towards French language and culture, while preserving their own cultural identity" (Genesee, 1987, pp. 12-13, Translation by author).

[^0]Thus, French immersion is distinct from the traditional approaches to bilingual education because the second language is not only explicitly taught but is also the medium of curriculum instruction.

### 1.2 Research Problem

French immersion students in Canada are taught to read in French as soon as they begin to speak the language. "In many forms of immersion, students are taught literacy skills in French before receiving formal literacy instruction in English" (Genesee, 2007, p. 1). Although the French immersion programme has had great success in Canada since 1965 (Stern, 1991), some concerns remain (Bournot-Trites \& Séror, 2003; Hogan \& Harris, 2005; Keep, 1993; Stern, 1991). These concerns relate to the quality of French oral and written skills students attain, and the relatively high drop out rate in immersion programs (Keep, 1993; Stern, 1991). Stern (1991) noted that only $50 \%$ to $60 \%$ of the students starting in Kindergarten continue until Grade 6. Keep's (1993) review of available research suggests that academic and behavioral difficulties constitute major factors in predicting transfer of French immersion students to the regular English programme. In addition, French immersion students in Grade 7 have reported difficulties with reading in French for content learning (Bournot-Trites \& Séror, 2003).

The ability to read and comprehend subject matter is core to learning. Reading comprehension is a vital cornerstone in early French immersion because subject matters are taught in French, especially in the later grades. In order to learn content, students need to understand what they read. As students progress in the French immersion curriculum, expectations increase regarding their ability to read French content for comprehension. Without this ability, students will experience increased difficulty achieving success in subject matters taught in French. This difficulty will compound in higher-level subjects within any immersion programme. Mathematics, Science, and Socials Studies are areas where academic success is
directly related to second language proficiency. Weaker comprehension skills may be a factor in the large number of students transferring out from French immersion programmes.

In the early stages of learning to read within the context of a second language, studies in alphabetic languages (Armand, 2000; Chiappe \& Siegel, 1999; Cisero \& Royer, 1995; Da Fontura \& Siegel, 1995; Durgunoğlu, Nagy, \& Hancin-Bhatt, 1993; Gottardo, Yan, Siegel, \& Wade-Woolley, 2001; Perragaux, 1994) and non-alphabetic languages (Abu-Rabia \& Siegel, 2002; Chiappe \& Siegel, 1999; Chiappe, Siegel, \& Gottardo, 2002a; Chiappe, Siegel, \& WadeWoolley, 2002b) as well as studies in French immersion (Bournot-Trites \& Denizot, 2005b; Bruck \& Genesee, 1995; Bruck, Genesee, \& Caravolas, 1997; Comeau, Cormier, Grandmaison, \& Lacroix, 1999; Genesee, 1979; Lafrance \& Gottardo, 2005; Rubin \& Turner, 1989; Tingley, Dore, Lopez, Parsons, Campbell, Kay-Raining Bird, \& Cleave, 2004) have shown that phonological awareness predicts word reading in second language. However, phonological awareness was a predictor of a smaller amount of variance in reading comprehension in French in French immersion (Bournot-Trites \& Denizot, 2005b).

The literature acknowledges the relationship of other variables such as spelling, verbal working memory, vocabulary, morphological awareness, syntactic awareness and second language cultural knowledge with reading and their role in literacy. In English, various studies have shown that spelling (Bruck, 1988; Haas \& Willows, 1998; Sprenger-Charolles, Siegel, \& Bonnet, 1998; St. Pierre, Laing, \& Morton, 1995; Stuart \& Masterson, 1992; Walton, 1997), verbal working memory (Baddeley, 1983; Chiappe, Hasher, \& Siegel, 2000; Chiappe et al., 2002a; Gottardo, Stanovich, \& Siegel, 1996; Muter \& Snowling, 1998), vocabulary (Hsueh-Chao \& Nation, 2000), syntactic awareness (Cupples \& Holmes, 1992; Tunmer, Herriman, \& Nesdale, 1988; Tunmer, Nesdale, \& Wright, 1987, 1999), and morpho-syntactic awareness (Ziarko \& Mélançon, 1999) predicted reading comprehension. In addition, first language reading studies
with children (Johnston, 1984; Pearson, Hansen, \& Gordon, 1979), studies with English as a second language adult readers (Carrell, 1981a, 1981b, 1987; Chen \& Graves, 1995; Johnson, 1981, 1982; Kang, 1992; Lee, 1986b; Steffensen, Joag-Dev, \& Anderson, 1979; Yuet \& Chan, 2003) and with English as a second language children (Campbell, 1981; Droop \& Verhoeven, 1998a; Garcia, 1991; Kerkhoff \& Vallen, 1985) have indicated that prior knowledge of passage content is a variable that can account for a significant proportion of the variance in reading comprehension. A common result of these studies was that readers read faster and recalled more and made more appropriate elaborations on culturally more familiar texts. Conversely, readers recalled less and made more distortions of the culturally less familiar texts. Yet, few studies have been conducted in French immersion about the best predictors of reading comprehension. This is the purpose of the present study.

### 1.3 Purpose of the Study

The purpose of this study is to examine the relative role of predictors of French immersion students' word reading and reading comprehension at the primary school level when they are receiving instruction in French. In particular, I will investigate the relative role of phonological awareness, spelling, verbal working memory, vocabulary, morphological awareness and second language cultural knowledge in French of Grade 3 French immersion students to determine the best predictors of reading comprehension.

### 1.4 Significance of the Study

The significance of the study lies in its contribution to reading research in a second language. The following research study is of particular interest in the present Canadian bilingual context, as it will expand the body of knowledge conceptualizing what it means to read in a second language, especially in the French immersion context. The present study will have theoretical, pedagogical, and programme development implications.

Theoretically, the study will be useful to extend the knowledge relevant to reading development about the role of different variables in second language reading comprehension.

With regard to implications in pedagogy, the findings of the present study could help teachers make instructional choices within the context of French language instruction at the elementary immersion level. There are a number of pedagogical areas that this research may impact by emphasizing instructional approaches to phonological awareness, morphological awareness, vocabulary, and cultural knowledge in second language classes. The results from this study could help teachers to formulate more suitable instructional techniques for reading comprehension to expand students' second language learning for content. In particular, addressing morphology skills using a counterbalanced approach (Lyster, 2007) through noticing, awareness and production activities. In addition, the findings of this study could also help to formulate instructional practices that bridge the cultural knowledge gap between the native culture of the reader and the culture of the second language, in this case of French text. For example, expanding students' lexical knowledge and second language cultural knowledge could be very helpful for second language reading comprehension. Such teaching strategies could enable students to make relations between their schematic knowledge and text information.

Research that examines reading comprehension in the context of programme development for French immersion is particularly relevant in view of the increasingly multilingual nature of student populations in French immersion. In addition, the insights obtained through this research could be used to guide teachers in providing students the support required for academic success. This success would act to encourage more students to remain in the French immersion programme to high school graduation.

### 1.5 Thesis Organization

The research following is divided by chapter.
Following this introductory chapter, Chapter 2 will present a review of the relevant literature. In Chapter 2, the concepts of second language reading processes and comprehension are discussed through Bernhardt's (2005) compensatory model of second language reading as the theoretical framework of the present study. The main variables that influence second language reading comprehension are also examined in this chapter. Chapter 2 ends with the specific questions underlying this research.

Chapter 3 introduces the context and research setting of the study. It describes the participants and defines the measures used. Chapter 3 also outlines the methods of data collection and data analysis. The chapter focuses on the quantitative approach in educational research, especially the use of regression analyses. Explanation is offered as to why this approach is appropriate for the research questions to follow. Chapter 3 also provides reason for the use of some exploratory qualitative analysis within the study.

Chapter 4 describes the results related to each of the research questions, from both quantitative and qualitative sources. The chapter further provides tables of mean scores, correlations among literacy, phonological, and linguistic variables and the prediction of literacy skills at the end of Grade 3 in French immersion as well as the themes discerned from interview data.

Chapter 5 discusses the research findings and their implications. The chapter suggests theoretical, pedagogical, and programme development implications derived from the results.

Chapter 6 states the limitations of the present study and offers suggestions for further research in the area of French immersion education.

The appendices include the ethics certificate, the letter sent to the parents, the tasks and their scoring procedures to give a more precise idea of the data used and the interview questions.

## CHAPTER 2: LITERATURE REVIEW

Chapter 2 explores theoretical and empirical issues related to second language reading skills. The first part of Chapter 2 investigates the theoretical framework for research in second language reading comprehension, drawing on similarities and differences with first language research. Special emphasis is placed on reading as an interactive and compensatory process.

Part two of this chapter reviews current research in first and second language, and French immersion. In particular, the relationship between the cognitive and linguistic processes such as phonological awareness, spelling, verbal working memory, vocabulary, morphological awareness, and second language cultural knowledge, and word reading and reading comprehension is examined and discussed.

### 2.1 Reading Theory and Reading Comprehension

As reading comprehension is the focal point of the present study, it is essential to start the review of the literature by describing its process.

The extensive research and theories of reading comprehension are based primarily on research conducted with monolingual English speakers. Reading can be approached from different perspectives which are interrelated (Day \& Bamford, 1998). These include psychological, cognitive, educational, philosophical, affective and socio-cultural perspectives. Based on the recent literature, all of these are operationalized with variables that influence the process of reading comprehension of both first and second language speakers (Bernhardt, 2005).

Learning to read is not a natural, simple or automatic task. Reading involves the simultaneous cognitive processes of linking the abstractions of phonemes (sounds) to graphemes (letters) to morphemes (words). Beginning readers must acquire the alphabetic principle. The alphabetic principle is defined as "useable knowledge of the fact that phonemes can be
represented by letters, such that whenever a particular phoneme occurs in a word, and in whatever position, it can be represented by the same letter" (Byrne \& Fielding-Barnsley, 1989, p. 313). It rests on an awareness of the internal phonological structure of words that the alphabet represents. In other words, that is the ability to use the sounds with letters to form words. In time, readers will likely learn to recognize frequent patterns of letters in words, which will increase the rate at which words are identified. However, the ability to decode words represents only a part of the total reading process.

Readers must also understand what the words mean when they are put together in the context of propositions, sentences and paragraphs. The ultimate goal of the abovementioned cognitive processes is to arrive at comprehension (meaning). Thus, learning to read in any language, involves the acquisition of word decoding ability (Gough \& Tunmer, 1986; Juel, Griffith, \& Gough, 1986) and the ability to comprehend written texts (Weber, 1991). Grabe (1988) indicates that "a description of reading has to account for notions that fluent reading is rapid, purposeful, interactive, comprehending and gradually developing" (p. 44). Without the ability to decode and comprehend text, reading cannot occur. In addition, within the context of French immersion, students also need to read text that may have a French cultural content. Therefore, students need to learn to become engaged and culturally competent readers in the second language.

This chapter will describe theories and models of reading which seem to be most closely related to this study and will relate them to each other as much as possible to provide a general description of the cognitive processes involved in reading. Just like teaching methodology, reading theories have had their shifts and transitions.

Many of these theories started with the traditional view which focused on the printed form of text such as bottom-up theories (Gough, 1972; LaBerge \& Samuels, 1974). Theories
then moved to the cognitive view that enhanced the role of background knowledge in addition to what appeared on the printed page. Referred to as top-down theories, they included schema theory (Anderson \& Pearson, 1984; Goodman, 1970) and interactive theory (Rumelhart, 1977; Stanovich, 1980). Reading theories then shifted to the socio-cognitive view taking into account the dynamic nature of language and cognitive aspects of reading. These theories are based on a system of storing and retrieving past knowledge, with the reader mediating and transacting with the text. They include transactional theory (Rosenblatt, 1994) and in second language the compensatory model of reading (Bernhardt, 2005). Some research (Block, 1992) examined the control and manipulation that a reader can have on the act of comprehending text. This control is related to metacognition and gave rise to the metacognitive view. However, the present research did not examine reading strategies. Thus, the metacognitive view will not be discussed in this paper.

A review of the above mentioned theories and models would help identify the major variables that influence reading comprehension, especially when considered within the context of French immersion.

### 2.1.1 The Traditional View: Bottom-up Reading Processes

Early research in English as a first language reading viewed reading as a receptive process. One of the first models was the simple view model of reading (Gough, 1972). In this model, reading comprehension ( R ) was viewed as the product of decoding (D) and linguistic comprehension (L) such as $R=D x L$. The reader "plods through the sentence, letter by letter, word by word" (Gough, 1972, p. 354). In the simple view of reading,
"The linguistic comprehension must assess the ability to understand language (e.g., by assessing the ability to answer questions about the contents of a listened to narrative). Similarly, a measure of reading skill must assess the same ability, but one where the comprehension process begins with print (e.g., by assessing the ability to answer questions about the contents of a read narrative." (Hoover \& Gough, 1990, p. 131)

In this model, linguistic comprehension is the ability to take lexical information and derive sentence and discourse interpretations. Reading comprehension involves the same ability, differing only in its reliance on graphic-based information. In this respect, the reader is not a guesser. The model is called bottom-up, and is data driven. By definition, in bottom-up processing the reader perceives input, which progresses from the lowest level of reading, decoding, to the higher levels of comprehending. It assumes that the reader is a blank slate. At the lowest level, the reader interprets symbols (letter recognition) and associate letters-soundswords. Following the process of decoding, the reader assembles words into sentences to comprehend a whole text and assign meaning. LaBerge and Samuels (1974) extended the model by postulating that these text recognition processes have to become automatic before the reader can attend to the meaning of the text.

In addition, as part of a developmental model, Ehri (1989) formulated a hypothesis stating that an intermediary stage exists between readers recognizing words on the basis of visual characteristics and reading through phonological recoding. Ehri $(1995,1996,1998)$ proposed a model of sight word recognition in four phases: pre-alphabetic, partial alphabetic, full alphabetic and consolidated alphabetic. During the first phase (pre-alphabetic), the beginning reader recognizes words on the basis of selective associations founded on the words' visual characteristics. During the second phase (partial alphabetic), the novice reader starts associating some but not all of the letters in printed words and their sound equivalents. During the third phase (full alphabetic), all graphemes are converted into phonemes. Finally, in the fourth phase (consolidated alphabetic), larger spelling units (onset-rhyme) but also morphemic units (roots) are used to recognize words as wholes.

In this developmental model, Ehri (1995) explains how beginners acquire the ability to recognize sight words rapidly and automatically. Ehri's (1995) research reveals that "mature
forms of sight word learning are alphabetic and phonological at root" (p. 117). For skilled readers, the stored orthographic information is more easily available and the process is also faster. However, "the availability of that information has to be distinguished from the actual use of that knowledge as reflected in the word recognition process" (Geva, Wade-Woolley, \& Shany, 1997, p. 121). Efficient letter naming has been seen by Ehri (1991) as essential to accurate decoding skills in English as a second language. Speed is only acquired after reading skills accuracy is achieved (Ehri \& Wilce, 1983).

However, in second language, "it is not letter naming per se, but familiarity with phonemes associated with each letter that is a necessary and crucial skill" (Geva et al., 1997, p. 140). Differences in availability and utilization of orthographic information may appear more dramatic in the development of literacy in a second language. Although relevant to word recognition processes in a second language, accuracy and speed do not merge concurrently in second languages. In the very early stages of learning to read in a second language, accuracy distinguishes the good from the poor readers in both languages. Reading speed continues to develop even when second language readers have achieved high accuracy rates. Finally, specific language features such as orthographic depth, morphosyntactic complexity and depth of lexical familiarity may interact with more global second language proficiency effects in the development of second language reading skills (Geva et al., 1997).

Although the bottom-up process is considered to be efficient and fast, it does not take into account the information stored in the memory of the reader. In fact, in discussing Gough's model, Rumelhart (1977) showed that bottom-up models failed to allow for the fact that the comprehension of letters, words and sentences are all affected by higher level processing. The meaning of a sentence is affected by the context in which it appears and in this way higher-level processes are used to enhance lower level input. Thus, psychologists, artificial intelligence
researchers and some linguists sought to learn more about the cognitive processes involved in reading. Understanding reading processes as well as the psycholinguistic and cognitive mechanisms associated with them became integral to the psychology of reading acquisition (Caravolas, 1993).

The consideration of higher level processes in reading brought a different approach to reading which emphasized the constructive nature of comprehension, known as top-down. This top-down model combined the interactive nature of reading processes to include the role of schema. In these reading models of the 1970s and 1980s, the process of interpretation suggested that input is mapped against some existing schema and that some aspects of that schema maybe compatible with the input of information. These models will be discussed in the next section.

### 2.1.2 The Cognitive View: Top-down, Schema Theory and Interactive and Reading Processes

### 2.1.2.1 Top-down Reading Processes

In the 1970s, the top-down process of reading was championed by Goodman (1970) who changed the thinking about reading by adding a psycholinguistic aspect to it. In the framework that Goodman called the psycholinguistic guessing game, reading was defined as "an active process in which the reader produces hypotheses about the message of the text, then samples textual cues to confirm or reject those hypotheses" (Goodman, 1970, p. 260). Top-down processing occurs as the reader follows a cyclical procedure of sampling of the text, predicting what will come next, testing predictions, confirming hypotheses and forming new hypotheses. This view of reading is often called concept-driven, since the reader only samples the text in order to test hypotheses. In this approach, word recognition skills received minimal priority as the reader was not passive but played an active part in the text interpretation.

Goodman's (1970) view was probably too extreme in dismissing the role of word reading. Contrary to the earlier predictions of top-down conceptualization, later research in cognitive studies showed that most text words are thoroughly processed during reading. As Stanovich (1980) pointed out, if readers do not recognize a word or a phrase because it is less familiar, they can compensate by using a top-down method of guessing. If the topic is less familiar, the bottom-up process can be utilized. This compensation may account for differences not only among first language readers but also among proficient and less proficient readers in an additional language. It can be argued that different people process text in different ways, depending on their individual purposes, attitudes, interests and background knowledge.

In particular, the importance of previous knowledge had already been recognized very early on by Kant (1781). Kant claimed that new information, new concepts and new ideas can have meaning only when they can be related to something the individual already knows. Another crucial issue was how the individual makes sense of the new information, how a person's knowledge of the world interacts with incoming information, and how new information is added to pre-existing concepts (Bartlett, 1932). This new information changed the accepted theory of reading in first or additional language since the 1970's and 1980's from a bottom-up and topdown model to a schema-theoretic view of reading.

It is presumed that humans depend on memory or previous knowledge of some kind when they interpret written cues (Ausubel, 1963). In the late 1970's, Rumelhart and Ortony (1977) underlined the fact that knowledge was stored in long-term memory. Later on, Adams and Collins (1979) applied this notion to reading. Models in which a reader's knowledge is at the center started to develop. Without previous knowledge, readers would not be able to take an active part in comprehending a text. For example, they would not be able to make inferences and
hypotheses about what they are about to read next. Through the review of the pertinent literature, the next section will highlight the importance of schema theory in reading.

### 2.1.2.2 Schema Theory

Cognitive psychology took schema theory one step further and explained how mental networks of information are created by experience and developed through each incoming stimulus (Rumelhart, 1980). However, Anderson and Pearson (1984) were the first to coin the term schema theory. This term implied that a schema refers to
"a statement written in abstract, inclusive terms deliberately introduced before a text and intended to provide a conceptual bridge between what the reader already knows and the propositions in the text that is hoped he will understand and learn." (Anderson \& Pearson, 1984, p. 258)

Although there may be some debate over the origin of the concept of schema, it is suggested that the term schema was first introduced by Piaget (1926), who believed that humans develop through a series of qualitative stages built upon common knowledge he called schemata. Although it was not an entirely new concept, Anderson and Pearson (1984) expanded its meaning.

A schema is a generalized description or a conceptual system for understanding knowledge and how knowledge is represented and used. Each schema carries with it component information which makes it meaningful to the reader. For example, the schema of $a \operatorname{dog}$ may have different slots. Within the schema for dog is knowledge about dogs in general (four legs, tail, hair, barking, etc.) and information about specific dogs such as boarder collies (long hair, Lassie, etc.). The schema for dog can also be thought of in a greater context of animals and living species such as breathing, needing food and capable of reproduction. This schema can be extended to state that dogs are mammals and thus are warm-blooded and bear their puppies as opposed to laying eggs. Depending on one's personal experience, the notion of a pet (domesticated, loyal to the master) or as an animal to fear (likely to bite and attack) may be part
of the schema for dog. Each new experience incorporates more information into one's schema. Schemata may be triggered by components of a schema (slots), or the slots may be inferred through activation of the schemata. In this way, words and phrases trigger schemata, which "act as models of thought and behaviour" (Sharifian, 2003, p. 196).

A schema can be activated by certain words or phrases more effectively than by others. These words or phrases can act as triggering devices in the reading of a text. Individuals have schemata for everything. Long before students come to school, they develop schemata about everything they experience. Schema theory states that all knowledge is organized into units. Within these units of knowledge or schemata is information that is stored. Schemata become theories about reality. These theories not only affect the way information is interpreted or comprehended, but also continue to change as new information is received.

Although schema theory has contributed greatly to reading research, critics have pointed out that such top-down models do not define sufficiently how text features and previous knowledge interact. Recent studies in reading comprehension have asserted that neither the bottom-up nor the top-down approaches alone adequately characterize the reading process. This complex process has to be seen as a synthesis of both approaches. It is interactive in nature. Grabe (2002) points out that accepted theory of reading in second or foreign language has changed since the 1970's from a bottom-up and top-down model to reading as an interactive process.

### 2.1.2.3 Interactive Model of Reading Processes

The interactive aspects of reading comprehension were added by language researchers in the late 1980's (Goodman, 1988; Grabe, 1988) and 1990's (Kintsch, 1998a, 1998b). Because reading cannot be limited to its sole cognitive aspect, a clarification of what is meant by interactive aspects is essential in order to be able to see how interactive aspects of reading can
accommodate other pertinent perspectives of reading. The term interactive is often used in different ways. In the context of the present study, the word interactive is used to mean the interaction between text and reader as well as the interaction between the reader and his/her background knowledge. This definition stresses the importance of reading as part of the communication process between the writer and the reader, mediated by the text. Thus, the term interactive also means the interaction between top-down and bottom-up processes.

Reviewing the relevant reading research since the 1990s, Kintsch (1998a, 1998b) developed a new way to discuss the interactive model of reading with two main levels: lowerlevel processes and higher-level processes. Kintsch called his model the construction-integration framework, which he defined as:
"The construction-integration model distinguishes between two main processes: a construction process, whereby a textbase containing the propositional meaning of the text is constructed from the textual input, and the integration process, whereby the constructed textbase becomes integrated into the reader's global knowledge, forming a coherent mental representation of what the text is about or a situation model." (Kintsch, 1998b, p. 96)

Within this model, the bottom-up and top-down processes mentioned earlier are referred to as lower-level and higher-level processes. Those levels interact to result into a construction integration model. Word decoding and comprehension abilities combine and interact to produce fluent reading. Within lower-level processing, readers must be able
"to recognize lexical units by processing orthographic, morphemic and phonemic information and activate word meanings (lexical access), extract syntactic information (syntactic parsing), and integrate all the pieces of information (propositional integration), in a rapid, interactive and automated fashion, to create initial unit meanings." (Grabe, 2002, p. 53)

Within higher-level processing, readers must be able to assemble clause-level information into a text model of understanding, referred to as a text model of reading. As readers prepare to read each word, phrase or text, they form in their mind a summary representation of the basic meaning. In turn, this representation closely reflects textual information by combining
clause-level information and ideas. Readers also have to make appropriate inferences. This process is referred to as a situation model of text interpretation (Kintsch, 1998a). To reach an interpretative model of text ( $a$ situation model of text interpretation), readers combine their initial representation (a text model of reading) with other factors such as prior knowledge, prior experience, cultural orientation and affect (motivation, attitude towards the text content) and evaluation of the text itself. The higher-level complex knowledge structures function as 'ideational scaffolding' (Anderson et al., 1977) for the information in the text. This process allows the information to be readily assimilated.

Reading comprehension can be conceptualized as a multi-dimensional process with two different levels. Text level factors include the discourse structure, clarity and syntactic complexity. Reader level factors include reading and accuracy speed, linguistic comprehension, and background knowledge.

However, in the context of second language reading, although all readers share some common knowledge, it is culturally specific knowledge that differentiates cultural groups (Anderson, Reynolds, Steffensen, \& Taylor, 1982). The influence of the reader's second language cultural knowledge on reading is important. Fundamental to the interactive reading model presented previously there must be some system of storing and retrieving past knowledge. Readers and especially second language readers are required to bring, use and apply their cultural orientation, past experience and/or prior knowledge, also referred to as top-down knowledge, in making sense of the written word. Within this second language context, using concepts of schema theory in combination with an interactive approach, Carrell and Eisterhold (1988) classified schemata used by second language readers into three different types: (a) linguistic, (b) content, and (c) formal.

Linguistic schemata are the reader's prior knowledge and level of proficiency in the second language. The linguistic structure refers to the knowledge about grammatical structure of a text (Carrell, 1988). Linguistic schemata is also known as literacy component (Bernhardt, 1991a, 1991b).

Content schemata are the reader's prior background knowledge (Carrell, 1983b, 1983c; Urquhart \& Weir, 1998), or world knowledge (Bernhardt, 1991b) of the content area of the text. It includes culture specific knowledge (Carrell, 1983c) or cultural knowledge of the target culture. Cultural competence (content schemata) is presently held to be equal in importance to literacy competence (linguistic schemata) if reading comprehension is to occur in second language contexts (Carrell, Devine, \& Eskey, 1988; Maria, 1990).

Formal schemata, also referred to knowledge of form (Eskey, 1986), encompass the reader's prior knowledge of the rhetorical structures of texts. A rhetorical structure refers to knowledge about the forms and structures peculiar to texts or genres including fables, simple stories, scientific texts, and newspapers articles. When readers have knowledge of text structures in the target language, comprehension increases (Urquhart \& Weir, 1998).

In the field of second language reading literature, native culture is recognized as a filter of perceptions and understandings of another culture, its language and people (Bernhardt, 1991a, 1991b; Kramsch, 1991, 1993, 2003). It is important to see that second language cultural knowledge is likely to impact reading comprehension when reading in a second language context. This is especially of importance in the French immersion context where in order to learn the content of the subject matter being taught in French, students need to understand what they are reading. Thus, the role of second language culturally conditioned knowledge in the comprehension of written text has been part of the focus of Bernhardt's compensatory model of second language reading. Section 2.1 .3 following outlines within the sociocognitive view of
reading Bernhardt's (2005) compensatory model of second language reading for the present study.

### 2.1.3 The Sociocognitive View: Compensatory Model of Second Language Reading

As early as the 1930's, Vygotsky (1934) emphasized that different contexts create different forms of development. As development is a product of culture, culture and social interaction are very important in cognitive development. Cognitive processes such as language, thought and reasoning develop through social interaction. Social interaction with knowledgeable others moves development forward through the zone of proximal development (ZPD), i.e., through the difference between the level of actual development and potential development. Bruner's (1996) sociocognitive stage theory went one step further emphasizing the role of social interaction and language. Language is important as it forms the basis of understanding. Without language, thought is limited.

Bernhardt (2005) defines a model of second language reading within the sociocognitive view of reading as her model also takes into consideration the social function of reading. In the social view the processing of text focuses on the social environment as it impacts personal qualities such as thinking and feeling. This is in contrast to the cognitive theory of reading. In Bernhardt's (2005) model, the cognitive view includes first language literacy variables (e.g., alphabetics, vocabulary, text structure, beliefs about word and sentence configuration) and second language knowledge variables (e.g., grammatical form, vocabulary knowledge, cognates, and first- and second-language linguistic distance. First language literacy variable 'alphabetics' and second language knowledge variable 'grammatical form' need also to be acquired for second language learners. According to Bernhardt (2009), "using literacy knowledge means applying
what a reader already knows about written language to understand other written language" (p. 13).

In addition to the cognitive view, in Bernhardt's (2005) model, the social view includes hypothetical variables such as engagement, interest and motivation as well as content and domain knowledge. Content and domain knowledge encompasses second language cultural knowledge. In Bernhardt's sociocognitive model, the reading process depends on first and second language literacy knowledge, interest and attitudes of the reader. However, readers from different cultural backgrounds may read a text differently from native language readers. Each cultural context provides a different reading of the text.

In Bernhardt's (2005) model, understanding is limited by the reader's cultural schemata which makes what the reader brings to the text as important as the text itself. Readers' cultural schemata are changed as the reader progresses through the text and new knowledge and meaning is constructed. Therefore, Bernhardt (2005) argued for a compensatory model of second language reading. The model would formulate and capture a holistic depiction of the interaction of variables in the second language reading process. Bernhardt's (2005) model views reading comprehension as an interactive-compensatory process.
"The model attempts to conceptualize how familiarity with orthographic patterns can facilitate the word recognition process without actual language knowledge; or how the higher the first language literacy level, the more it is available to buttress impoverished second language processes or how the more word knowledge is developed, the more it frees up resources to operate on more complex syntactic patterns and so forth." (Bernhardt, 2005, p. 140)

The following section will present and define the compensatory model of second language reading for this research.

### 2.1.3.1 Description of the Model



Figure 1. A compensatory model of second language reading. Adapted from Bernhardt (2005, p. 140).

Bernhardt's (2005) model is three dimensional in nature. The three dimensions are: (a) first language literacy knowledge, (b) second language knowledge, and (c) unexplained variance ${ }^{2}$. First language literacy knowledge includes alphabetics, vocabulary, text structure, beliefs about word and sentence configuration. Second language knowledge includes grammatical form, vocabulary knowledge, cognates and first language/second language linguistic distance. Hypothetical variables included comprehension strategies, interest and motivation, engagement, content and domain knowledge. According to Bernhardt (2005),
"A compensatory model tries to model how knowledge sources assist or take over for other knowledge sources that are inadequate or nonexistent-i.e., what they use to

[^1]compensate for deficiencies. (...) It illustrates that knowledge sources are not additive, but rather operate synchronically, interactively." (p. 140)

Some variables selected from Bernhardt's (2005) model are key to assessing reading comprehension in the context of French immersion. Utilizing all of Bernhardt's variables would be beyond the scope of the present study. I have limited myself to key variables in French such as phonological awareness, spelling, verbal working memory, vocabulary, morphological awareness and second language cultural knowledge. These have all been shown to be important in reading in second language and French immersion by empirical research. This empirical research will be described in section 2.2.

In Bernhardt's model, the variable 'beliefs about word' "refers to the sound/symbol correspondences" (Bernhardt, 2009, p. 12). Considerable information about phonological aspects, letter and how words are recognized is known in second language literacy contexts (Favreau, Komoda, \& Segalowitz, 1980; Favreau \& Segalowitz, 1982, 1984). Students usually begin school in their first language. Second language instruction follows in transition from this beginning. When students learn a second language, they transfer some literacy knowledge already acquired in their first language (Selinker, 1991). It is important to note that early French immersion students start formal literacy in French in Kindergarten. At the Grade 3 level some French immersion students may already have reading skills in English and most of them are in contact with English literacy both at home and in their communities. Thus, French immersion students transfer English literacy knowledge such as phonological awareness to their acquisition of literacy in French (Comeau et al., 1999). However, measuring their literacy knowledge only in their first language would not take into account what the students learned in schools in their second or additional language programme (Bournot-Trites, Denizot, \& Siegel, In preparation). Therefore, since the knowledge is transferred to French, measured literacy knowledge for the
purpose of the present research was conducted in French, which is the second language of the participants tested.

Bernhardt's second language knowledge 'grammatical form' refers to "linguistic features such as morphology and syntax" (Bernhardt, 2009, p. 13). However, morphology is different from syntax. Syntax pertains to the status of the word (e.g., noun, verb, adjective, article) and the sentence construction in a text (e.g., word order in a sentence) (Gombert, 1992).

Morphology refers to the morphemic structure of words. Morphological awareness is the ability to reflect on and manipulate that structure. Morphology specifies the form of words for number or gender and those that convey information about tense or modes (e.g., verbs). Morphemes are the smallest units in a language that convey meaning. Grammatical morphemes can have a syntactic function. Articles, prepositions and conjunctions serve as examples of this function (Gombert, Colé, Valdois, Goigoux, Mousty, \& Fayol, 2000). French immersion students transfer the English language knowledge they may have such as morphological awareness to their acquisition of literacy in French (Deacon, Wade-Woolley, \& Kelly, 2006).

In addition, how readers acquire word meanings (vocabulary) remains in large part a great mystery. It is clear that children are not directly 'taught' the thousand of words that they learn to use by the time they reach adolescence. Whether vocabulary causes reading ability or whether fluent reading causes vocabulary knowledge is subject to ongoing research in the field of literacy. What is known however, is that word knowledge is crucial to the study of a second language (Nagy, 2005; Nagy, Herman, \& Anderson, 1985). For a second language learner, the flexibility in lexical knowledge is essential. Anderson and Nagy (1991) noted "Really knowing a word (...) always means being able to apply it flexibly but accurately in a range of new contexts and situations" (p. 721).

Domain knowledge in Bernhardt's model (2005) was first labeled as world knowledge (Bernhardt, 1991b). Domain knowledge refers to content schemata, which include second language cultural knowledge. Examination of culturally determined cognitive structures, which underlie the production of distinctive discourse patterns in second language, is important to the understanding of content schemata. Throughout the literature the role of background knowledge as a facilitator of second language is well-established (Carrell \& Grabe, 2002). However, its effects have been moderate to weak in terms of statistical significance (Bernhardt, 1991b). This is due to the fact that the interplay between language proficiency (linguistic schemata) and background knowledge (content schemata) has often led to inconclusive or contradictory results.

When investigating the effect of specific background knowledge (content knowledge) on reading comprehension, Clapham (1996) found that the specificity of a text determines the relative importance of background knowledge and language proficiency. Clapham (1996) emphasized that there is a certain threshold of language ability below which it is difficult for readers to use their background knowledge. Ridgway (1997) investigated the notion further and proposed a framework with a lower and an upper limit of threshold.

Below the lower limit, poor readers cannot comprehend a given passage because they lack linguistic and background knowledge. In turn, this lack of linguistic and background knowledge cause cognitive short-circuits that cannot be overcome even if the reader has recourse to top-down reading strategies. Above the upper limit a proficient reader will not show much in terms of background knowledge effect unless the text content is highly specific. Intermediate level readers, which situate themselves between the lower and upper threshold, will show more obvious background knowledge effect than proficient or poor readers. It can be observed "that language proficiency levels play at least as important a role as background knowledge in the comprehension of reading texts" (Weir, Huizhong, \& Yan, 2000, p. 26). Bartlett (1932)
recognized that when readers process unfamiliar text manifestations of the cultural differences in schemata are evident. Cultural schemata enable a reader to differentiate the most important information in a text. When appropriate cultural schemata are available, readers may differentially allocate cognitive resources to what they perceive as most important ideas.

Therefore, the compensatory model of second language reading proposed by Bernhardt (2005) highlights the need to examine the interplay of morphology and vocabulary in text processing in a second language. Bernhardt's model also calls for experiments involving hypothetical variables by using reading tasks that stimulate different levels against the backdrop of language and cultural knowledge. Key variables influencing the process of reading in second language can be derived from the compensatory model of second language reading. It is essential to examine those variables that potentially may play a role in reading comprehension of French immersion Grade 3 students. In the present study, the variables to be examined include phonological awareness, spelling, verbal working memory, vocabulary, morphological awareness and second language cultural knowledge. These variables will be introduced and expanded upon in section 2.2.

### 2.2 Empirical Research about Important Variables in Second Language Reading Comprehension

Any attempt to explain the processes whereby a text is understood in a second language entails an understanding of the cognitive processes in which knowledge is represented, processed and used in comprehension. Of particular importance to this study, especially in view of the participant's linguistic background, is knowledge of the language as well as knowledge of the world (second language cultural knowledge). Knowledge of the language includes processes that are significant in the development of reading skills. Some of the basic cognitive skills involved in reading development are: (a) phonological awareness, (b) spelling, (c) verbal working
memory, (d) vocabulary, and (e) morphological awareness. Knowledge of the world includes second language cultural knowledge. Empirical research in second language research language involving phonological awareness, spelling, verbal working memory, vocabulary, morphological awareness and second language cultural knowledge are presented and discussed in sections 2.2.1 to 2.2.6.

### 2.2.1 Phonological Awareness

Phonological awareness is defined as "the ability to reflect on and manipulate sublexical phonological units such as syllables, onsets, rimes, and phonemes" (Bruck \& Genesee, 1995, p. 308). Phonological awareness skills are distinguished by the size of the unit (syllables and phonemes) and the task performed (rhyming, segmentation, blending, permutation, deletion, and isolating). Distinction among phonological awareness skills based on unit of word structure include: (a) syllables, or (b) smaller intrasyllabic units, like onset (initial consonant or consonant cluster present in many English syllables), or rimes (remaining vowel and consonants), or (c) phonemes, the minimal units of language realized in speech as individual sounds (Bruck \& Treiman, 1990). Sections 2.2.1.1. and 2.2.1.2 will discuss the development of phonological awareness and the phonological structure of language differences that might be expected to influence the development of certain phonological awareness skills. Section 2.2.1.3 will present the empirical research of the role of phonological awareness in word reading.

### 2.2.1.1 The Development of Phonological Awareness

Phonological awareness develops gradually over time and is the phonological processing ability most strongly related to early reading ability. In English as a first language, phonological skills progress from awareness of syllables (Liberman, Shankweiler, Fischer, \& Carter, 1974) to phonemes (Bruck \& Treiman, 1990; Bryant, MacLean, Bradley, \& Crossland, 1990b; Treiman \& Zukowski, 1991). Among Anglophones, the development of phonological awareness spans from
early childhood and progresses from awareness of larger units to increasingly smaller units (Bruck \& Treiman, 1990; Bryant et al., 1990b; Treiman \& Zukowski, 1991). Many four yearsold and the majority of five year-old are able to segment words into syllables and count the number of syllables in words (Liberman et al., 1974). These four and five-year old can also judge whether words begin or end with the same syllable (Treiman \& Zukowski, 1991). Between the ages of five and six, children also develop onset and rime awareness (Bryant et al., 1990b).

Phoneme awareness normally develops between the ages of six and seven. This awareness is demonstrated in abilities such as counting, isolating and deleting phonemes from stimulus word (Liberman et al., 1974; Stanovich, Cunningham, \& Cramer, 1984). One sort of manipulation that remains difficult is the segmentation of phonemes (Bruck \& Treiman, 1990; Treiman \& Zukowski, 1991). Even good readers in the third grade failed to delete the first phoneme of a complex onset (Treiman \& Zukowski, 1996). Phonemic awareness is not a unitary indivisible insight or ability. Some phonemic abilities (such as phoneme blending) appear to be prerequisite to learning to read, whereas other abilities (such as phoneme deletion) may be outcomes of learning to read (Perfetti, Beck, Bell, \& Hughes, 1987).

Most children achieve minimal levels of phoneme awareness prior to early reading instruction. Learning the names of letters and sounds they represent provides a base for phonemic ability. Phonological awareness generally develops quickly once early reading instruction begins. This is true for children learning to read an alphabetic language that has transparent orthography - consistent spelling to sound relations and vice versa. The relative ease of syllable segmentation compared to phoneme segmentation was confirmed using a variety of experimental tasks while more recent work has investigated the intermediary role played by onsets and rimes (Treiman \& Zukowski, 1991, 1996).

Research indicates that pre-readers display good awareness of larger units such as the syllable and the onset and rime, but display poor awareness of the smaller phoneme unit. Awareness of the phonemes is most influenced by the introduction of early reading skills. "This conceptualization of phonological awareness suggests that bilingualism may not increase phonological awareness skills in general, but may influence awareness of specific phonological units" (Bruck \& Genesee, 1995, p. 310). However, phonological structure of language differs. These linguistic differences might be expected to influence the development of certain types of skills in a second language, including phonological awareness skills. Factors influencing language abilities will be explored in the following section.

### 2.2.1.2 Factors Influencing Language Abilities

Theorists have hypothesized about the factors that influence language abilities. The challenges facing second language readers are the orthographic differences between languages before first language reading strategies and skills can be used efficiently in a second language context. Differences in the consistency or transparency of written language are important. Compared to English, French is more transparent although French it is not considered one of the most transparent languages. French has a shallower relationship between its orthography and its phonology than English. A hypothesis can be made that French-speaking children might be expected to learn to read more quickly than English-speaking children once reading instruction has begun.

Furthermore, French is a syllable-timed language whereas English is stressed-timed. French speakers rely more often on a syllabic routine whereas English speakers rely on phonemic routines for segmentation (Cutler, Mehler, Norris, \& Segui, 1986). If syllable is the most salient unit in processing spoken French, then a second hypothesis can be formulated that syllable awareness may be the best predictor of early reading skills for French-speaking children.

These orthographic differences, known respectively as orthographic depth hypothesis and script dependent hypothesis, will be explored in more detail in the following section.

The degree of similarity between first language and second language phonology and orthography may affect the reading acquisition process (Geva \& Siegel, 2000; Geva \& WadeWoolley, 1998). The first specific feature relates to orthographic differences between the learners' first and second language and is referred to as the orthographic depth hypothesis.

According to the orthographic depth hypothesis, a language with a transparent relationship between its orthography and its phonology is said to be shallow, while a language with an opaque relationship is considered to be deep. For example, although the French and English languages are both alphabetic, their orthographies are quite different. It is necessary to consider them when comparing the relationship between phonological processes and reading in French immersion.

The French system is somewhat inconsistent with many silent letters, especially in word final position. It also has some syntactic marks that have no correspondence in speech. English is characterized as a quasi-regular orthography with the regularity at the level of the onset rime (Content, 1991). In English, both word regularity and frequency influence reading performance. In French, the data showed word regularity and frequency effects. However, because the roles of the lexical and non-lexical routes are different, word regularity has a strong influence on reading performance in French while word frequency has a much smaller influence on reading performance (Ziegler, Perry, \& Coltheart, 2003). English is considered to have a deep orthography. French is more transparent with an intermediate orthography. Thus, Frenchspeaking children might be expected to learn to read more quickly than English-speaking children once reading instruction has begun.

Additional factors such as the phonological and syllabic structure of the spoken language and the linguistic complexity, e.g. saliency and complexity of word structures differ as well (Carroll, 2004). The script dependent hypothesis claims that language ability is influenced by a language's orthographic structure and the predictability of the correspondence between graphemes and phonemes (Liberman et al., 1974). For example, English is considered a stresstimed language while French is a syllable-timed language. These differences may affect the organization of phonological representations of words and the size of the unit that is the most salient for reading acquisition. French speakers rely on a syllabic routine whereas English speakers on a phonemic routine for segmentation (Cutler et al., 1986). Nevertheless French has a number of silent letters (e.g., acide, drap, nid, etc.). If syllable is the most salient unit in processing spoken French, then syllable awareness may be the best predictor of early reading skills for French-speaking children.

### 2.2.1.3 The Role of Phonological Awareness in Reading

For the past thirty years a number of studies have established the relationship between phonological awareness and the ability to read. Studies into this phonological relationship used English as a first language learners (Adams, 1990; Bowey, 1994b; Bryant, MacLean, \& Bradley, 1990a; Naslund \& Schneider, 1996; Siegel \& Ryan, 1988; Snowling, 1981; Stuart \& Masterson, 1992; Swan \& Goswami, 1997; Wagner, Torgesen, Rashotte, Hecht, Barker, Burgess, Donahue, \& Garon, 1997) and French as a first language learners (Demont \& Gombert, 1996; Gaux, 1996; Gaux \& Gombert, 1999b; Gombert, 1992). There are fewer studies examining this relationship in a second language context (Armand, 2000; Chiappe \& Siegel, 1999; Cisero \& Royer, 1995; Da Fontura \& Siegel, 1995; Durgunoğlu et al., 1993; Gottardo et al., 2001; Lafrance \& Gottardo, 2005; Perragaux, 1994). To date, a small number of studies have been conducted in the context of the French immersion programme (Bournot-Trites \& Denizot, 2005b; Bruck \& Genesee,

1995; Bruck et al., 1997; Comeau et al., 1999; Genesee, 1979; Rubin \& Turner, 1989; Tingley et al., 2004).

Phonological awareness has been shown to be a good predictor of word decoding and reading in first language as well as in second language. A number of studies in English as a first language have shown a strong relationship between phonological awareness and the ability to manipulate those sounds when learning to read (Adams, 1990; Blachman, 1994; Bradley \& Bryant, 1983b; Juel, 1988; Schatschneider, Fletcher, Francis, Carlson, \& Foorman, 2004; Stanovich, 1986, 1988; Wagner \& Torgesen, 1987). Developmental and correlational research has indicated that a strong and reliable correlation exists between levels of phonological awareness and word reading achievement among first language English speaking readers (Bradley \& Bryant, 1983a; Bryant et al., 1990a; Calfee, Lindamood, \& Lindamood, 1973; Juel et al., 1986; Perfetti, 1985; Perfetti et al., 1987; Share \& Stanovich, 1995; Stanovich \& Siegel, 1994), and among readers of other alphabetic first languages such as Spanish (Alegria, Pignot, \& Morais, 1982), Italian (Casalis \& Louis-Alexandre, 2000), and Swedish (Lundberg, Frost, \& Peterson, 1988).

Additional evidence comes from several studies that have identified readers who lack this linguistic insight as being more likely to be among the poorest readers (Byrne \& FieldingBarnsley, 1993; Iversen \& Tunmer, 1993; Juel, 1988; Mann, 1993; Share, Jorm, Maclean, \& Matthews, 1984; Stanovich et al., 1984; Torgesen \& Burgess, 1998; Vellutino \& Scanlon, 1987; Wagner, Torgesen, \& Rashotte, 1994; Wagner et al., 1997). In particular, Stuart and Masterson (1992) tested 20 pre-school English-speaking students over six years using six phonological tasks of rhyme and phoneme awareness as well as IQ scores, single word reading, spelling and vocabulary tasks. Participants' scores on phonological awareness tasks as four-year old prereaders predicted their word reading six years later at age 10. However, Stuart and Masterson
(1992) showed that poor phonological awareness at four to six years of age is predictive of word reading difficulties throughout the elementary school years.

The Stuart and Masterson (1992) results appear to indicate that individuals who have difficulties in reading have a lower phonological awareness than the good readers regardless of age (Pratt \& Brady, 1988; Shaywitz, 1996). Based on these findings, intervention studies (Castiglioni-Spalten \& Ehri, 2003; Ehri, Nunes, Stahl, \& Willows, 2001; Elbro \& Petersen, 2004) at the Kindergarten and Grade 1 level have demonstrated the efficacy of instruction in phonological awareness and phonics on word reading acquisition. Participants who had been identified as 'at-risk' for future reading difficulties from their low performance on phonological awareness measures improved with phonological awareness and phonics instruction.

A growing body of research has shown that phonological awareness predicts word reading in second language English for readers whose first language is alphabetic (Chiappe \& Siegel, 1999; Cisero \& Royer, 1995; Da Fontura \& Siegel, 1995; Durgunoğlu et al., 1993; Gottardo et al., 2001; Perragaux, 1994) or non-alphabetic (Abu-Rabia \& Siegel, 2002; Chiappe \& Siegel, 1999; Chiappe et al., 2002a; Chiappe et al., 2002b). Available research indicates that phonological skill deficits are a common attribute of weak readers (Da Fontura \& Siegel, 1995).

Yet, little is known about early reading processes in immersion situations because few studies have been conducted in bilingual contexts on phonological awareness and early reading. A small number of studies have examined reading processes in French immersion contexts (Bournot-Trites \& Denizot, 2005b; Bruck \& Genesee, 1995; Bruck et al., 1997; Comeau et al., 1999; Cormier \& Kelson, 2000; Lafrance \& Gottardo, 2005; Rubin \& Turner, 1989; Tingley et al., 2004).

In French immersion programmes students learn to read and write in French beginning in Kindergarten. When French immersion begins in Kindergarten and continues into first grade it
involves teaching individuals to read only in the language that they are acquiring. Reading and writing in their familiar mother tongue are introduced only later (Kendall, Lajeunesse, Chmilar, Shapson, \& Shapson, 1987).
"Students attending an immersion curriculum provide a unique opportunity to observe interactions between two languages while they are being learned and allows one to determine whether similar cognitive processes underlie word decoding and reading comprehension skills in both languages." (Anderson, 2004, p. 186)

Studies in the French immersion context found that phonological awareness predicted word reading (Bournot-Trites \& Denizot, 2005b; Bruck \& Genesee, 1995; Bruck et al., 1997; Comeau et al., 1999; Cormier \& Kelson, 2000; Lafrance \& Gottardo, 2005; Rubin \& Turner, 1989; Tingley et al., 2004). These studies could not agree on whether phonemic or syllabic awareness was a better predictor of word reading in English or in French.

The first study undertaken about the importance of phonological awareness in French immersion was by Rubin and Turner (1989). Rubin and Turner were the first to compare phonological awareness of 16 English-speaking Grade 1 students in English programs to 16 English-speaking Grade 1 students in French immersion programs in Ontario. All participants were from monolingual English homes. The linguistic task was assessed using a modified version of the Auditory Analysis test (Rosner, 1972). The modification consisted in adding more items for syllable analysis and by eliminating the more difficult item for phoneme analysis. Participants were given a spelling and a word-reading task. All the tasks were in English. Results indicated that French immersion students were more proficient at explicitly analyzing spoken words and deleting a syllable or a phoneme correctly. The question unanswered was whether phonemic or syllabic task better predicted English word reading of French immersion students.

Bruck and Genesee (1995) were concerned that the conclusions reached in the study of Rubin and Turner (1989) were too broad. Rubin and Turner (1989) did not control for other factors such as intelligence and socioeconomic status that could be responsible for these results.

Thus, Bruck and Genesee (1995) replicated the study in the province of Quebec with 72 English monolingual students and 91 bilingual French-English students in Kindergarten over a period of 3 years. However, when the individuals were retested in Grade 1, there were 60 English monolingual and 77 bilingual participants. Bruck and Genesee (1995) controlled for reading experience and cognitive and linguistic skills. Measures in English included three phonological awareness, three syllable awareness and four onset-rime awareness tasks.

Bruck and Genesee (1995) found different patterns of relationship between phonological awareness and word reading. Kindergarten students in French immersion programmes had an advantage over English monolingual students on onset-rime awareness. This advantage disappeared in Grade 1. In first grade the phoneme awareness tasks predicted word reading for English monolingual participants but the syllable awareness tasks predicted English word reading for the bilingual participants. Results of the Bruck and Genesee's (1995) study suggested that English does not have a one-to-one relation between graphemes and phonemes. Words are not always pronounced as they are spelled in English and there are many irregularities within the language structure itself. French speakers rely more on a syllabic routine whereas English speakers on a phonemic routine for segmentation (Cutler et al., 1986). Results of the Bruck et Genesee (1995) study also indicated a possible advantage for English-speaking participants in phoneme awareness. Monolingual participants were provided phonological training, which may have affected differences in reading instruction.

Bruck and Genesee's (1995) findings are not consistent with those of Rubin and Turner (1989) who reported advantages in phonological awareness only for their Grade 1 bilingual participants without distinguishing between syllable or phoneme advantage. Examining the Bruck and Genesee's (1995) study in isolation it can be argued that for French immersion students the best predictor of word reading in English is syllabic tasks and not phonemic tasks.

However, the language in which students learn to read may influence which variable, phoneme or syllable awareness is the best predictor of word reading. In Canada, Bruck et al. (1997) explored the idea further. They examined early literacy in 94 French- and 105 Englishspeaking monolingual students in Kindergarten and first grade over a period of 3 years in the province of Quebec. When students were retested in Grade 1 there were 90 English and 85 French participants remaining. In addition, 18 bilingual English- and 19 bilingual Frenchspeaking participants (selected from the same school) were given the same battery test in their nonnative language (French). Participants were administered in Kindergarten and Grade 1 phonological awareness tasks (comprising of separate syllable, onset-rime and phoneme subtasks) and a letter knowledge task. In Grade 1, a word recognition - all items were highfrequency words in English (Kucera \& Francis, 1967) and French (Baudot, 1992) - and non-word reading tasks were added.

Results in the Bruck et al.'s study (1997) showed that phonological awareness had an influence on early reading acquisition for both English and French monolingual and bilingual participants. However, the authors also found that what predicted reading success (words and non-words) differed for each language depending on the phonological awareness task and the language in which it was administered. Bruck et al. (1997) found that phonemic tasks predicted letter knowledge success in Kindergarten for Anglophone unilingual participants and syllabic tasks for Francophone participants. In Grade 1, onset-rime measures predicted word and nonword reading success for the monolingual English participants. Syllabic tasks predicted word and non-word reading for the monolingual French participants. For French immersion participants, syllabic tasks predicted word reading in Grade 1, regardless of language of test, whereas phonemic awareness tasks predicted word reading in Kindergarten.

Bruck et al. (1997) interpreted the results as suggested by the script dependent
hypothesis. As mentioned earlier in section 2.2.1.2, the script dependent hypothesis states that French and English differ structurally in that the syllable plays a greater role in French. French has a greater number of multisyllabic words than English in the lexicon of beginning readers. For Anglophones learning to read in French, the fact that the syllable is more salient in French than in English could explain the shift from phonemic awareness to syllabication in the study by Bruck et al. (1997). According to the Bruck et al.'s research, the language in which students learn to read influences the phonological awareness tasks that predict reading. However, these results were contrary to the study conducted in a francophone educational setting (Demont $\&$ Gombert, 1996).

The Demont and Gombert (1996) study tested 23 Kindergarten monolingual students in France over a period of four years on phonological awareness and syntactic awareness tasks and two reading tasks (recoding abilities and reading comprehension). The study showed that phonemes and not syllables predicted moderately reading words in Kindergarten and Grade 1. The discrepancy between the Bruck et al. (1997) and Demont and Gombert (1996) studies might be explained by the method of reading instruction. Phonics instruction could result in a greater awareness for phonemic tasks than syllabic tasks. There could also be an interaction between first language and method of reading instruction. Although the Bruck et al. (1997) study confirmed the predictive role of phonological awareness on early word reading abilities, results were still contradictory concerning the role of phonemes or syllables as best phonological predictor of early word reading in French.

Subsequent studies in French immersion showed that phonemic awareness predicted word reading (Bournot-Trites \& Denizot, 2005a; Comeau et al., 1999; Cormier \& Kelson, 2000; Tingley et al., 2004). In a more recent study, Tingley et al. (2004) examined the development pattern of phonological awareness in French immersion students in Nova Scotia. Tingley et al.
(2004) extended the work of Bruck and Genesee (1995) on the effects of second language acquisition on phonological awareness. Tingley et al. (2004) compared 19 English-speaking Kindergarten and 17 Grade 1 students going to Anglophone schools with 17 Kindergarten and 19 Grade 1 students of French immersion school. The Tingley et al.'s study investigated syllable, onset-rime and phoneme awareness skills in English and in French.

Tingley et al.'s (2004) three way mixed ANOVAs results revealed several effects and interactions. In terms of grade effect, Grade 1 participants performed significantly better than primary participants on phoneme and onset-rime tasks. All participants performed better on English tasks than on French ones. Tingley et al. (2004) also found through posthoc analyses that French immersion participants performed better on English phoneme and syllable tasks than on French tasks. English participants performed better than French immersion students on French syllabic tasks. Further correlational analyses revealed significant relationships between reading (real and non words) and the phoneme awareness task regardless of programme of instruction (English, French immersion) or language of reading test (English, French). However, syllable awareness was only significantly correlated $(r=.35)$ with the French non-word reading task for the French immersion students.

The Tingley et al. (2004) results were similar to Bruck et al.'s (1997) for the comparison between monolingual Anglophone and Francophone students. However, it varied from the Bruck and Genesee (1995) study for the predictors of word reading. Their results did not support the hypothesis that participants would perform superiorly on those phonological tasks which contained the salient features of their language of instruction: that is syllable for French immersion students. The reason may be two fold. First, according to Tingley et al. (2004), the French phonological stimuli task in their study did not correspond to the typical syllabic structure of the language.

The words followed a CVC ${ }^{3}$ or CCVC English structure rather than CV or CCV French structure (Cutler et al., 1986; Sprenger-Charolles \& Siegel, 1997).
"The French immersion students' knowledge of the French language may have interfered with their performance on French stimuli tasks. Thus, since French immersion students were more proficient in the English language, it would follow that these students would perform better on the English syllable task." (Tingley et al., 2004, p. 281)

Secondly, as Nova Scotia is an English unilingual province, students would have limited exposure to the French language, contrary to students in the province of Quebec.

Additional evidence comes from a study predicting risk for difficulties in reading in French and English in French immersion students in British Columbia by Bournot-Trites and Denizot (2005a). The study involved 102 Kindergarten and 137 Grade 1 French immersion students and 84 Kindergarten and 134 Grade 1 English monolingual students. They examined whether the same kind of predictor measures in English and French would differentiate French immersion Kindergarten and Grade 1 participants who were considered 'at-risk' for reading difficulty. The English and French tasks were similar. The tasks in Kindergarten included non-word reading, initial and final of phoneme deletion, rime recognition and letter identification. In Grade 1, phoneme substitution, initial and final syllable deletion, verbal working memory (sentences), word attack and word reading tasks were added.

Results from regression analyses showed that the phonemic task (initial phoneme deletion) in English in Kindergarten explained $28 \%$ of the variance of word reading ability in English in Grade 1 for French immersion students. Similarly, results showed that the phonemic task (initial phoneme deletion) in English in Kindergarten explained 25 \% of the variance of word reading ability in French in Grade 1 for French immersion students. Results from regression analyses also showed that the phonemic task (initial phoneme deletion) in French in Kindergarten

[^2]explained $23 \%$ of the variance of word reading ability in French for Grade 1 French immersion students. The Bournot-Trites and Denizot (2005a) study also found that the French immersion students in Kindergarten and Grade 1 scored significantly higher than English programme participants on both English reading tests and English tests of phonological awareness and verbal working (sentence repetitions). Results also showed a significant relation in that French immersion participants identified as being 'at risk' on French tasks were also identified as being 'at risk' on the English tasks: in Kindergarten $\chi^{2}(1, \mathrm{n}=102)=29.15, p<.001$, and in Grade 1 $\chi^{2}(1, \mathrm{n}=102)=24.55, p<.001$.

Bournot-Trites and Denizot (2005a) also examined the predictors of word reading, reading comprehension and spelling in a cross-sectional study in 179 Grade 1, 165 Grade 2, 137 Grade 3 and 141 Grade 4 French immersion students. Measures in French included phonological awareness tasks, verbal working memory (measured by sentence repetition), spelling (French Immersion Achievement Test) (Wormeli \& Ardanaz, 1987), word reading (French Immersion Achievement Test) (Wormeli \& Ardanaz, 1987) and reading comprehension (Curriculum Based Assessment and French Immersion Achievement Test) (Wormeli \& Ardanaz, 1987). Phonological awareness tasks included in Grade 1, initial and final phoneme deletion and initial and final syllable deletion. In Grade 2 they included middle phoneme deletion and phoneme permutation. In Grades 3 and 4, the phonological awareness task combined phoneme and syllable deletion.

Results from regression analyses showed that in Grade 1, phonemic awareness as measured by initial phoneme deletion and final phoneme deletion accounted respectively for $23 \%$ and $3 \%$ of the variance of Grade 1 word reading in French. In Grade 2, phonemic awareness as measured by middle phoneme deletion and phoneme permutation accounted respectively for $27 \%$ and $\mathbf{8 \%}$ of the variance of Grade 2 word reading in French. However, phonemic awareness as measured
by middle phoneme deletion explained only a small percentage (4\%) of the variance of Grade 2 reading comprehension in French measured by Curriculum Based Assessment. In Grades 3 and 4, the combined phoneme and syllable deletion task accounted respectively for $10 \%$ and $15 \%$ of the variance of Grades 3 and 4 word reading. However, the combined phoneme and syllable deletion task accounted only for $7 \%$ of the variance of reading comprehension as measured by the French Immersion Achievement Test (Wormeli \& Ardanaz, 1987) in Grade 3 and $12 \%$ in Grade 4. Thus, phonemic awareness tasks predicted word reading and reading comprehension up to Grade 2. In Grades 3 and 4, as the phonemic and syllabic tasks were combined, no conclusive results could be reached on whether phonemic or syllabic tasks predicted word reading and reading comprehension.

Comeau et al. (1999) studied cross-linguistic effects for a group of French immersion students with mixed English-only and English-French backgrounds. The Comeau et al. (1999) study investigated the cross-language transfer of phonological awareness as well as the role of lexical access and verbal working memory in word reading in French immersion students. The 122 participants were tested in English and French in Grades 1, 3, and 5 in New Brunswick. The study was conducted over a calendar year. Participants were administered measures of word decoding and phonological awareness in French and English. Measures of cognitive abilities (a test of nonverbal intelligence), lexical access (naming speed), verbal working memory and pseudoword repetition were administered in English only. The relationship of phonological awareness in French to reading in each of the languages was equivalent to that in English. The study indicated that phonological awareness in both languages predicted one-year increment decoding skills in French. These findings supported the transfer of phonological awareness skills across alphabetic languages (Cisero \& Royer, 1995; Durgunoğlu et al., 1993).

Cormier and Kelson (2000) extended the study of Comeau et al. (1999) with 103 students in Grades 1 to 3 in French Immersion in New Brunswick. Because this study was an extension of Comeau et al.'s (1999), the majority of the tests selected were taken from that study. Cormier and Kelson (2000) found that phonological awareness is equivalently related to word decoding in either language. However, for the French phonological task, Comeau et al. (1999) and Cormier and Kelson (2000) used a test developed by Cormier, MacDonald, Grandmaison and OuelletteLebel (1995). This test was adapted from Rosner and Simon (1971) and combined both phonemic and syllabic segmentation items simultaneously. The Cormier and Kelson (2000) study reinforced the hypothesis of phonological awareness being a strong predictor of French word reading but did not say whether syllabic or phonemic tasks predicted word reading.

Similarly, Lafrance and Gottardo (2005) in an eight month longitudinal study of French/English bilingual students in French language schools in Ontario examined the relationship between phonological processing skills and word reading in both French (L1) and English (L2). Forty Kindergarten students were administered measures of phonological awareness, working memory, naming speed, and word reading in both languages. The results of multiple regression analyses showed that phonological awareness skills in both French and English predicted word reading performance in both languages. Test results did not vary even after accounting for the influences of cognitive ability, working memory and naming speed. These findings support the hypothesis that phonological awareness is strongly related to beginning word reading. The Lafrance and Gottardo (2005) study used a composite score for phonemic and syllabic items in accordance with Comeau et al. (1999). It is therefore difficult to predict if phonemic tasks or syllabic tasks were better predictors of French word reading using the results of these studies.

However, intervention studies in Kindergarten and Grade 1 showed the efficiency of learning to read words by concentrating on phonological awareness and phonemes. Participants who were identified as 'at-risk' in reading according to the results on phonological tasks improved due to a teaching based on phonological ability (Castiglioni-Spalten \& Ehri, 2003; Ehri et al., 2001; Elbro \& Petersen, 2004; Lundberg et al., 1988). In French immersion, BournotTrites (2005) examined in Grade 1 the effect of phonemic instruction on word reading in French. This study was conducted in six French immersion schools in British Columbia. There were 53 French immersion students in the experimental group and 47 French immersion students in the control group. The intervention group received systematic and explicit instruction in phonemic awareness and letter-sound and grapheme correspondence through a multi-sensory phonemic instruction La méthode phonique (Molzan \& Lloyd, 2001). Each phoneme was associated with a story, a gesture, a picture, a grapheme, a variety of games, and activities. The instruction was complemented with literacy activities such as reading stories. In the control group the instruction method was more eclectic and with no systematic teaching of any sort. Pre-tests and post-tests measures consisted of letter naming and sounding, phonemic tasks, syllabic tasks, a writing task (10 simple words), an oral comprehension task and word reading tasks (monosyllabic and disyllabic words and nonwords). The Bournot-Trites (2005) study showed that the experimental group did significantly better on word reading than the control group. Thus, a systematic instruction of French phonological skills combined with literacy teaching seems to be an effective method for teaching reading in Grade 1 French immersion.

There is an apparent inconsistency in the phonological literature. Sometimes syllabic awareness is a better predictor of performance in word reading in French as a second language than phonemic awareness. Sometimes it is the other way around, and sometimes they are indistinguishable. In nay case, phonological instruction might result in better word reading in

French in early years. However, phonological awareness was not a predictor of a large amount of variance in reading comprehension in English first language (National Reading Panel, 2000), French first language in France (Demont, 2001; Demont \& Gombert, 1996; Gombert, 1992), or French second language in Canada in French immersion (Bournot-Trites \& Denizot, 2005b).

Demont and Gombert (1996) tested 23 Kindergarten monolingual students in France over a period of 4 years on phonological awareness, syntactic awareness and two reading tasks (recoding abilities and reading comprehension). Phonological awareness was measured by phonemic and syllabic task. Syntactic awareness was measured by lexical segmentation of sentences (counting and pronouncing words in sentences), grammatical judgment (judging the grammaticality of sentences with a morphemic anomaly ${ }^{4}$ ) and grammatical correction of asemantic and agrammatical sentence ${ }^{5}$. For the reading comprehension task, participants were administered the Khomsi's comprehension test (1990). Fixed-order multiple regressions were used in order to rule out for extraneous variables (abilities of non-verbal intelligence, IQ and vocabulary). Results showed that participant's phonological awareness predicted word reading but syntactic awareness predicted reading comprehension. In the Bournot-Trites and Denizot (2005b) study in French immersion conducted in British Columbia, the authors found that verbal working memory predicted reading comprehension as measured by French Immersion Achievement Test (Wormeli \& Ardanaz, 1987) in Grade 3 (accounting for $21 \%$ of the variance) and in Grade 4 (accounting for $15 \%$ of the variance). Other factors such as lack of morphological awareness or vocabulary may also be at work for reading comprehension, but these were not tested in the Bournot-Trites and Denizot (2005b) study.

[^3]The research listed indicates that in first (English and other languages) and second language (English and other languages) other variables predict word reading and/or reading comprehension: (a) spelling (Lesaux, Rupp, \& Siegel, 2007; Stanovich, West, \& Cunningham, 1991), (b) verbal working memory (Cain, Oakhill, \& Bryant, 2000, 2004a; Gottardo et al., 1996; Lesaux, Lipka, \& Siegel, 2006), (c) vocabulary (Ben-Zeev, 1977; Bialystok \& Herman, 1999; Hsueh-Chao \& Nation, 2000), (d) syntactic awareness (Cain, 2007; Geva, 2000; Gottardo et al., 2001; Muter, Hulme, Snowling, \& Stevenson, 2004; Oakhill, Cain, \& Bryant, 2003), (e) morphological awareness (Abu-Rabia, Share, \& Mansour, 2003; Bindman, 2004; Casalis \& Louis-Alexandre, 2000; Deacon, Wade-Woolley, \& Kirby, 2007; Deacon \& Kirby, 2004; Droop \& Verhoeven, 1998b; Mahony, Singson, \& Mann, 2000; McBride-Chang, Cho, Liu, Wagner, Shu, Zhou, Cheuk, \& Muse, 2005; McBride-Chang, Shu, Zhou, Wat, \& Wagner, 2003; Plaza \& Cohen, 2003; Wang, Cheng, \& Chen, 2006), and (f) second language cultural knowledge (Campbell, 1981; Carrell, 1983c; Droop \& Verhoeven, 1998a; Floyd \& Carrell, 1987; Hudson, 1982; Jiménez, Garcia, \& Pearson, 1995, 1996; Johnson, 1982; Lee, 1986a; Wang et al., 2006). These variables will be examined in the sections 2.2.2 to 2.2.6 following in relation to word reading and reading comprehension.

### 2.2.2 Spelling

Spelling captures how words are correctly written. Spelling can be measured through word dictation or spelling production. Spelling is different than orthographic knowledge. Orthographic knowledge mainly captures how letters are put together within orthography. Orthographic knowledge includes: (a) recognizing letter-sound relationships, (b) knowing which letter patterns are acceptable, and (c) understanding sound, syllable, and word position constraints on spelling patterns (Wascowitz, Apel, Masterson, \& Withney, 2004).

The most widely accepted theory of spelling development in alphabetic scripts is that of stage theories (Ehri, 1986; Henderson, 1985). As summarized by Treiman and Bourassa (2000):
"According to these theories, children begin knowledge of phonology to spell words. During later stages, additional sources of information come into play, including knowledge of orthographic patterns and morphological relationships. These latter types of knowledge are said to be unavailable to beginning spellers. (...) It may be more accurate to depict spelling development as consisting of the predominant use of a particular process or strategy at different points in time, but no to the complete exclusion of others." (p. 2)

As children begin to grasp the alphabetic principle, their spelling reflects attempts to symbolize the linguistic structure of the spoken language. Children gradually acquire a more sophisticated knowledge of the spelling system, "internalizing the classifications of sounds that are embodied in the conventional writing system" (Treiman \& Bourassa, 2000, p. 16). Children's knowledge of orthographic patterns and morphological information improves as spelling sophistication increases.

Evidence has also been presented that children often produce spelling patterns that are not consistent within a proposed stage of development. The problem of stage theories may be a result of the failure of such theories to take into account the complexity of phonological, orthographic and morphological awareness as they relate to spelling development. This is particularly important in the French immersion context.

For Canadian French immersion students, the French and the English language are encoded on several levels in the orthography: phonological, morphological, and orthographic (Deacon et al., 2006). In both French and English a word is spelled on the basis of sound. Both French and English spelling of a word is in part determined by the word's root and a suffix where applicable. Both French and English show contrastive and language-specific orthographic characteristics:
"In English, for example double consonants at the end of words (pull) but not at the beginning of the word (e.g., full but not fful) as well as double vowels (book). French
words cannot end with consonant doubles (e.g., pomme but not pomm for the word apple in French). Like morphological regularities, these patterns help to explain why spelling in both English and French do not always accord with phonetic encodings." (Deacon et al., 2006, p. 2)

Research indicates that orthographic knowledge predicts word reading and spelling in English first language (Stanovich et al., 1991), and in the French immersion context (Davydovskaia, Goetry, \& Wade-Woolley, 2004; Deacon et al., 2006). Research has also shown that spelling predicts reading comprehension in English as a second language (Lesaux et al., 2007).

In Australia, Stanovich, West and Cunningham (1991) investigated the relationship between phonological awareness, spelling ability, orthographic knowledge, reading (print exposure) and reading comprehension achievement in 129 Grade 6 monolingual students. Spelling was measured by the sub-test of the Wide Range Achievement Test (WRAT 3) (Wilkinson, 1993). Orthographic knowledge was measured using two tasks: a letter-string choice task and targeted words containing a letter name within the word or a vowel as an example. The Title Recognition Test (TRT) developed by Cunningham and Stanovich (1990) was used as a measure to assess the reading activity of participants (print exposure). The TRT consisted of thirty-nine book titles: twenty-five genuine titles and fourteen foil book titles. The twenty-five genuine titles were chosen to explore out-of-school reading rather than school-directed experiences. Reading comprehension was assessed using The Progressive Achievement Test in Reading from the Australian Council of Educational Research (1986). The reading comprehension test was administered to students to measure skill in factual, inferential comprehension and interpretation of prose material using multiple-choice questions. Results from multiple regression analyses showed that orthographic knowledge accounted for unique variance in word reading (print exposure) and spelling once phonological processing skills had been accounted for in the analysis of variance.

Second language readers must find ways to separate the orthographic knowledge they acquire in two languages in order to build language-specific representations. Davydovskaia et al. (2004) tested 132 Grade 3 French immersion students in Ontario. Testing was designed to identify orthographic differentiation and its relation to word reading and spelling in English and French. Testing measures included spelling in English and French, nonverbal intelligence, phonological awareness (phoneme deletion and blending), speed of lexical access (RAN - Rapid Automated Naming), and expressive vocabulary (name a presented picture). Word reading was measured in English through word identification and word attack of the Woodcock Reading Mastery Test- Revised (Woodcock, 1987). Reading in French was measured using word reading and pseudoword identification (Mousty, Leybaert, Alegria, Content, \& Morais, 1994).

The results indicated that ability in orthographic differentiation predicted reading and spelling in both first language (English) and second language (French) of the tested French immersion students. In addition, ability in orthographic differentiation explained unique variance in the word reading and spelling of French immersion Grade 3 students after controlling for age, non-verbal intelligence, phonological awareness, speed of lexical access and expressive vocabulary. Better knowledge of language-specific orthographic patterns (e.g., zay for English, zé for French) was associated with better reading and spelling performances in both English and French. French immersion Grade 3 students used orthographic markers to select the appropriate phonological and orthographic representations in reading and spelling. It could be argued that inefficient separation of orthographic knowledge acquired in two different languages may hinder the ability to read words.

In a recent cross-language analysis, Deacon et al. (2006) tested a group of 76 Grade 2 students enrolled in a French immersion programme in Ontario. The study was designed to determine the independent contributions of orthographic knowledge in English and French to
reading within and across languages. French word reading was assessed with the French Immersion Achievement Test (Wormeli \& Ardanaz, 1987). The orthographic task involved the recognition of the correct spelling of words out of a pair of letter=sequences. Results from linear regression analyses showed that French orthographic knowledge contributed to 7\% of the variance in English reading and 14\% in French word reading ability, independently of morphological and phonological awareness.

The results from these studies indicate that orthographic knowledge is important in reading words and contributes significantly to word reading. However, empirical evidence of the predictive role of spelling in reading comprehension in second language is still very limited (Lesaux et al., 2007), as no testing was undertaken in the French immersion context.

One recent study has examined the role of spelling in reading comprehension in English as a second language context. In a longitudinal study, Lesaux et al. (2007) investigated the reading development of 824 students in British Columbia. Six hundred eighty-nine of those studied were native speakers of English. Hundred thirty-five were non-native speakers of English representing 33 different native languages. Participants were assessed in Kindergarten and Grade 4 on word reading, spelling, phonological processing, syntactic awareness (measured by oral cloze) and working memory skills. Reading comprehension was assessed only in Grade 4 using short passages and multiple-choice questions. The spelling tasks comprised both words (WRAT3) and pseudoword spelling. Results from descriptive analyses showed that nonnative speakers of English performed on an individual level better on the spelling of words compared to native speakers of English. Native speakers of English had a higher performance on the spelling of pseudowords than nonnative English speakers.
"However, with respect to the effect of language status (English as a first language or second language as a predictor to detect differences between language groups), when predicting reading comprehension in Grade 4 , simple spelling was the only variable that
had a significant interaction with language status (English as a first and second language) to influence reading comprehension scores." (Lesaux et al., 2007, p. 828)

In addition, results from hierarchical linear regressions showed that letter identification, working memory, and phonological awareness (rhyme detection and phoneme deletion) in Kindergarten predicted fourth-grade word reading (Lesaux et al., 2007). Similarly, letter identification, working memory, and oral cloze in Grade 4 were identified as significant predictors of fourth-grade reading comprehension. The differential effect across the two language groups for predicting reading comprehension was explained by the fact that words to be spelled in fourth grade become more phonologically and morphologically complex. First language speakers scored higher than second language speakers in these areas.

Orthographic knowledge has been shown to predict word reading in English as a first language and French as a second language in the French immersion context. Spelling has also been shown to predict reading comprehension in English as a second language. However, the role of French spelling in French reading comprehension has not been addressed within the context of French immersion in any studies to date. Research in second language has identified verbal working memory as a cognitive process also involved in reading comprehension.

### 2.2.3 Verbal Working Memory

Verbal memory is an important distinguishing factor in both word reading and reading comprehension. Working memory refers to the retention of information in short-term storage while processing incoming information and retrieving information from long-term storage (Baddeley, 1983). Working memory involves storing and holding information when reading for later synthesis into sentences or words (Alloway, Gathercole, Adams, Willis, Eaglen, \& Lamont, 2005; Baddeley, 1986, 2000; Wagner \& Torgesen, 1987). Reading requires students to simultaneously process, retain and retrieve information.
"This processing environment is a major source of variation in reading abilities, and in particular, a source of difference between skilled and less skilled readers. (...) Issues of processing efficiency in working memory also implicate speed of lexical access and proposition integration. As a consequence, reading processes need to be carried out at a reasonably rapid rate to ensure fluent reading." (Grabe, 2000, p. 232)

Fifty percent of all function words (prepositions, conjunctions, and articles) and seventyfive percent of all content words (nouns, verbs and adjectives) in a text are actually sampled by fluent readers (Just \& Carpenter, 1987). The practice of relying heavily on the context to extract meaning from text is characteristic of the "weaker readers who are over-compensating because they have inadequate word recognition skills and lack automaticity in comprehension processing" (Grabe, 2000, p. 227). The more efficient the readers, the better they are at basic word decoding. This factor allows a top-down process to operate to the benefit of efficient readers. Efficient readers can rely on this process whenever needed to assist comprehension. In the case of less efficient readers, as may be the case of second language readers, weaker and less automatic decoding skills or vocabulary recognition skills will force them to spend more effort in identifying and comprehending words. This will lead to a disabling cognitive overload (Alderson, 2000). Thus, the working memory of the reader plays a crucial role in this process. Therefore, the activity of reading in a second language places a considerable demand on the individual's working memory (Siegel, 2002).

Previous research in second language has shown that poor word readers have more difficulties on measures of verbal working memory (Chiappe et al., 2000; Comeau et al., 1999; Siegel \& Ryan, 1989; Swanson, 1993, 1999). In a more recent large-scale study, Chiappe, Hasher and Siegel (2000) examined the relationship between working memory and the word reading ability of 665 individuals between 6-49 years old. The listening span task (participants had to supply a missing word in a sentence) was used to assess working memory. The reading subtest of the Wide Range Achievement Test measured individuals' ability to read words in
isolation. The total sample included 351 skilled readers and 314 participants with reading disabilities (scoring $26^{\text {th }}$ percentile on the WRAT).

Chiappe et al. (2000) found that at each age, skilled readers had higher listening span scores than did disabled readers. Difficulties in working memory for disabled readers extend beyond childhood into adulthood. Performance on the working memory task generally improved until the age of 19 years but then declined into adulthood. The decline in working memory skills associated with age may result from "growing inefficiencies in inhibitory ${ }^{6}$ control, and not diminished capacity" (p. 8). In other words, the decline may result from deficits in the inability to clear from working memory information that is irrelevant or information that is no longer relevant.

Jongejan, Verhoeven and Siegel (2007) emphasized that "completing a verbal working memory task in second language reading is likely to place additional demands on the working memory of individuals" (p. 837). Therefore, it can be argued that a working memory task in the second language for French immersion students, would act as a good predictor of word reading as the same task in English.

Only a small number of studies in second language have investigated the role of working memory in word reading. In English second language studies with children, working memory, as measured by sound mimicry and memory for sentences, contributed significantly to word reading and pseudoword reading skills in second language (Gholamain \& Geva, 1999; Lesaux et al., 2006). However, in other studies working memory contributed significantly to word reading only in first language and not in second language (Chiappe et al., 2002b; Da Fontura \& Siegel, 1995; Geva, Yaghoub-Zadeh, \& Schuster, 2000; So \& Siegel, 1997).

[^4]The authors explained this contradictory result by the fact that second language learners may experience a lack of fit between their native language phonological representations and the phonological structure of the language they are learning (e.g., Portuguese, Hebrew or Chinese). Their short-term memory may be limited in the foreign language due to difficulties in encoding adequate phonological representations. Research findings remain inconclusive in determining the influence of working memory in word reading in second language speakers. However, empirical evidence of the predictive role of working memory in reading comprehension of children in first and second language, though more limited, appears more conclusive at this time.

Deficits in working memory are an important factor in reading comprehension success. Low score results seem linked to poor comprehension. Results from studies in first language with Anglophone Grades 3 to 5 students (Cain et al., 2000, 2004a; Gottardo et al., 1996) and Francophone Grade 3 students (Seigneuric \& Ehrlich, 2005) have identified working memory as a direct predictor of reading comprehension when compared to vocabulary and decoding skills.

Cain et al. (2004a) reported data from a longitudinal study that addressed the relationship between working memory capacity and reading comprehension skills in students aged 8,9 , and 11 years. At each age, the authors assessed student's reading ability, vocabulary and verbal skills, performance on two working memory assessments (sentence-span and digit working memory), and reading comprehension (inference making, comprehension monitoring, story structure knowledge). At each time point, working memory predicted unique variance in reading comprehension. This was most evident in the inference-making and comprehension monitoring component skills after controlling for word reading ability, vocabulary and verbal ability. Researchers commented that comprehension difficulties relate to an inability to make inferences, as individuals must retrieve, maintain, and manipulate information related to the text.

Lesaux, Lipka and Siegel (2006) investigated the influence of cognitive and linguistic
skills on reading comprehension within the English as second language context. A total of 489 Grade 4 students were tested. Three hundred ninety-five of those studied were native speakers of English. Eighty-five were English second language speakers. All participants were part of a longitudinal study that began in Kindergarten and second language participants were from diverse linguistic background. Kindergarten and Grade 4 measures included memory for sentences, phonological awareness and syntactic awareness (oral cloze). Reading was only assessed in Grade 4. Word reading was assessed using word and pseudoword reading (WRAT3). The reading comprehension task consisted of reading short passages followed by multiplechoice questions.

Participants were also classified in three comprehension groups: "(1) children with poor comprehension in the absence of word reading difficulties (poor comprehenders), (2) children with poor word reading and poor comprehension (poor word recognition and comprehenders), and (3) children with good word reading and comprehension abilities (good comprehenders)" (p. 99). The comprehension-level match design (Johnston, Barnes, \& Desrochers, 2008) allows for testing more easily hypotheses about the nature or the deficits specific to comprehension where there is a particular interest in individuals whose reading comprehension difficulties are not accompanied by problems in word reading.
"When good decoders/less skilled older comprehenders are matched to younger children for reading comprehension skill (even word reading is better for the older group), poorer performance by the good decoders/poor comprehenders on a candidate skill such as inference-making may represent an actual cognitive deficit in comprehension as opposed to a developmental delay in acquiring skills important for comprehension." (Johnston et al., 2008, p. 126)

The comprehension-level match design would then suggest that inference making is causally implicated in reading comprehension because poor comprehenders but not younger skilled comprehenders are deficient in this skill.

Furthermore, results from the Lesaux et al. (2006) regression analyses showed that
phonological awareness, syntactic awareness and working memory for sentences in Kindergarten and in Grade 4 significantly predicted variations in Grade 4 reading comprehension. Within the good and poor comprehender readers groups, English as a second language speakers performed at a significantly lower level on working memory for words than the first language speakers. Such findings would suggest that working memory in English as a second language reading is causally implicated in reading comprehension. Poor comprehenders in this case associated with English as a second language speakers are deficient in this skill.

Bournot-Trites and Denizot (2005a) examined the role of phonological awareness, spelling and working memory in reading comprehension in 137 Grade 3 students within the French immersion context. Working memory was assessed with a sentence repetition task. Reading comprehension in French, as measured by a Curriculum Based Achievement test, was comprised of comprehension questions after the reading of a narrative passage. Results from regression analyses showed that working memory contributed $3 \%$ of the variance in reading comprehension. It may be that the task used to measure verbal working memory in second language lead to different results. Lesaux and Siegel (2003) found significant differences in the working memory of English as a first and second language Kindergarten students. Native English speakers performed better on a sentence working memory task than non-native English speakers.

Verbal working memory has been found to relate to literacy abilities. It has not been fully determined how verbal working memory skill relates to reading comprehension of second language learners, especially in the context of French immersion. Other variables may also influence second language reading and present a challenge to second language readers. Second language learners have themselves identified three other variables, vocabulary, grammar, and content knowledge (which includes second language cultural knowledge) as their most pressing
need to achieve a better comprehension of text (Laufer \& Yano, 2001). Vocabulary and grammatical form are part of Bernhardt's (2005) compensatory model of second language reading second dimension. Content knowledge is part of Bernhardt's model third dimension (see section 2.1.3.3).

### 2.2.4 Vocabulary

In Bernhardt's (2005) compensatory model of second language reading, one variable of the second language knowledge dimension that could be important in reading comprehension is vocabulary knowledge.

Vocabulary is usually defined as the individual word or lexical level. Lexical information (i.e., semantic information at the word level) is necessary to derive sentence and discourse interpretations. Measures of vocabulary have been shown to be highly predictive of performance on tests of reading comprehension (Alderson, 2000) and of reading comprehension across grades (Schatschneider, Harrell, \& Buck, 2007). Vocabulary has been identified as the most contributing factor to text comprehension for both first and second language readers (Laufer, 1989, 2003). Laufer (2003) indicated that in order to gain adequate comprehension and be able to guess unknown words from content, readers need to know $95 \%$ of the words in a text. When students learn and read content such as in Science and Social Studies texts in the context of French immersion, it could be even more important for reading comprehension.

Second language readers may face lexical challenges pertaining to the density and coverage of vocabulary. This is even more appropriate in the context of French immersion content area reading where learner variables might impact the readability of course materials. These variables are often pre-selected with first language speakers in mind. A number of lexical features exist in second language that distinguishes first language reading ability. The feature that characterizes lexical challenges in second language reading is the short-circuit hypothesis
(Clarke, 1980) or language threshold hypothesis (Clapham, 1996).
The short-circuit hypothesis (Clarke, 1980) relates to a threshold where vocabulary becomes insufficient for adequate comprehension. The language threshold hypothesis (Clapham, 1996) maintains that there is a breaking point in second language - a threshold - beyond which second language readers have to progress before their first language reading abilities can transfer to the second language situation. This general threshold of proficiency (and very variable) in the second language must be attained in order for the reader's first language reading skills to transfer to reading in a second language. Research has shown that good first language readers often fail to transfer their skills and strategies to their second language because of vocabulary unfamiliarity. Second language readers do not begin to read the second language, often English, with the same English knowledge available to English-speaking readers. As Grabe (2002) points out for adult readers, "most first language readers begin their instruction with at least 6,000 words already known in their language and with a firm tacit knowledge of most basic grammatical structures of the language" (p. 55).

If the learner is below the threshold, vocabulary knowledge is not sufficient for adequate comprehension. If the learner is beyond this threshold, then the learner knows enough vocabulary, other things being equal, to gain adequate comprehension of a text. This notion of lexical threshold is particularly important for reading in second language as new and younger and/or older readers in a second language do not possess the same level of vocabulary of younger first language readers. The average first language student learns about 3,000 words per year in the early school years (8 words per day) (Baumann, Kame'enui, \& Ash, 2003; Graves, 1986).

Laufer and Yano (2001) point out that "vocabulary of foreign language learners who are high school graduates and even university students does not amount to a quarter of the vocabulary known by their native speaking peers" (p. 549). It can be assumed that it will be even
less for Grade 3 students ( 9 years old) in French immersion programmes. In view of the various lexical challenges discussed in this section, it would seem crucial to support second language reading, and in particular, second language vocabulary reading development in non-native speakers of French in the French immersion programme. This view appears to be confirmed by empirical research in both first and second languages.

In first language English research on readability literature, "ease of comprehension" (Harris \& Hodges, 1995, p. 203), a relationship between vocabulary and reading comprehension is shown with mixed results. Some studies showed significantly enhanced comprehension when texts contained more high-frequency words (Wittock, Marks, \& Doctorow, 1975). Some studies showed modest effects when vocabulary was manipulated to make texts more or less easier to read (Freebody \& Anderson, 1983a, 1983b; Stahl \& Fairbanks, 1986). Other studies showed no improvement as a function of vocabulary alterations (Nolte, 1937; Ryder \& Hughes, 1985). One reason for these mixed-results has been put forward in a more recent study by Hsueh-Chao and Nation (2000).

Hsueh-Chao and Nation (2000) showed that although the knowledge of vocabulary constitutes a key component to reading, researchers have suggested several models to describe the relationship between vocabulary knowledge and reading comprehension. The factor involved in these models relates to language knowledge (of which vocabulary knowledge is) and knowledge of the world (cultural knowledge).
"The instrumentalist view is contrasted to the aptitude view (vocabulary knowledge is one of many outcomes of having a good brain) and the knowledge view (vocabulary is an indicator of good world knowledge). (...) We cautioned against adopting an instrumentalist view of vocabulary knowledge as being a major prerequisite and causative factor in comprehension. (...) Having a large vocabulary and a good comprehension can also be seen as an indicator of good world knowledge. (...) Different relationships exist at different stages of vocabulary growth and skill development." (Hsueh-Chao \& Nation, 2000, pp. 404-405)

Vocabulary knowledge is complex and takes into account the breadth of knowledge (number of words known), the depth of knowledge (the amount of knowledge for each word) and automaticity (using a word quickly).

In addition, studies of children with difficulties in reading comprehension show that problems in comprehension are associated with poor vocabulary skills (Catts, Adolf, \& Ellis Weismer, 2006). In a study with students age 9 to 10 years, Cain, Oakhill and Lemmon (2004b) matched old good and poor comprehenders on the basis of word reading and vocabulary. Reading comprehension consisted of stories written each containing a made-up word with a novel meaning, i.e., not a synonym of a known word. The researchers found differences in reading comprehension and other comprehension-related skills such as inferencing in poor comprehenders. Such results would suggest that vocabulary skills alone couldn't explain all comprehension difficulties.

However, second language English research with children has been more conclusive when examining the level of vocabulary in reading comprehension. Pre-school bilingual children in English-Hebrew (Ben-Zeev, 1977) and English-French (Bialystok, 1988; Bialystok \& Herman, 1999) have a smaller vocabulary than comparable monolingual speakers of each language. These differences in vocabulary level may disadvantage bilinguals in early literacy compared to their monolingual peers and affect their reading comprehension.

Although vocabulary has been found to be predictive of second language reading comprehension, the nature of the relationship is complex. Second language readers may face lexical challenges pertaining to vocabulary in the text, both in terms of the number of words known and the amount of knowledge for each word. They may experience difficulty when reading a text and having to comprehend it. This difficulty would even be more applicable in the
context of French immersion content area reading. Vocabulary might impact the readability of course materials particularly when it relates to specific concepts in science or social studies.

The vocabulary threshold level has also been used to explain why the literacy component (Bernhardt, 1991b) also referred to as linguistic schema (the knowledge about grammatical structure of a text) is unable to compensate for lack of linguistic proficiency and world knowledge (cultural knowledge of the target culture). World knowledge referred to as content schema (Carrell, 1983b, 1983c; Urquhart \& Weir, 1998). Assuming that a threshold exists, it is not absolute and will vary with the difficulty and language level of a text as well as the reader's prior knowledge and the situation context (Bernhardt \& Kamil, 1995; Carrell \& Grabe, 2002). The difficulty of a text at it relates to morphological awareness (one aspect of 'grammatical form' under the second language knowledge dimension in Bernhardt's (2005) compensatory model of second language reading), may be another important variable that could play a role in reading comprehension.

### 2.2.5 Morphological Awareness

Being aware of the morphology is "an individual's conscious awareness of the morphemic structure of words and their ability to reflect on and manipulate that structure" (Carlisle, 1995, p. 194). Morphology specifies the form of words for number or gender, and those that convey information about tense or modes (e.g., verbs). Morphemes are the smallest units in a language that convey meaning. Morphemes are divided into two types: lexical and grammatical morphemes. Lexical morphemes allow the words to have a meaning in themselves: for example nouns, adjectives and verbs. All have therefore a semantic function. Grammatical morphemes have a syntactic function. For example, articles, prepositions and conjunctions. All have syntactic functions (Gombert et al., 2000). Morphologically complex words are built from a root, prefixes and suffixes. However, morphology is different from syntax.

Syntax pertains to the status of the word (e.g., noun, verb, adjective, article) and the sentence construction in a text (e.g., word order in a sentence) (Gombert, 1992). Syntactic awareness refers to the level of sensitivity to the grammatical structure of a language. Syntactic and morphological skills each address a separable form of grammatical skills.

Children usually know the basic morphological and syntactic structures in their own mother tongue before they even begin to read. However, the knowledge of understanding the basic morphology and syntactic structures cannot possibly be available to the same levels in second language readers when compared to first language readers (Carrell \& Grabe, 2002). Nation (2001) emphasizes that the construction of a sentence, in syntactic terms, is in part determined by the choice of vocabulary, especially that of verbs. Morphological and syntactic tasks in second language are likely to be more challenging for second language than first language learners, as these tasks require a certain degree of language proficiency. In addition, syntactic awareness has been hypothesized to aid word recognition skills by allowing the reader to use the syntactic constraints of a sentence to decode unfamiliar words (Rego \& Bryant, 1993). It is also thought to aid reading comprehension by facilitating sentence- and text-level integration (Tunmer \& Bowey, 1984).

In the French immersion context, it might be expected that a higher level of bilingualism would perhaps be necessary to let syntactic and morphological awareness emerge as a predictor of word reading and reading comprehension. French immersion students who drop out of the programme have generally lower levels of phonological awareness which facilitates word recognition. In French first language, "children could use their syntactic knowledge in order to extenuate phonological analysis of mistakes when they read unfamiliar words" (Demont \& Gombert, 1996, p. 316). Results of these studies suggest that syntax could affect the acquisition of word decoding skills and could be essential in word recognition by enhancing children's
decoding skills. Phonological awareness might also favorably interfere with the detection of grammatical cues in sentence processing (Muter et al., 2004). This might act to facilitate the monitoring of comprehension through the processes of text integration when readers make mistakes in decoding.

Morphological awareness plays a similar role in reading.
"It is possible that morphological awareness is a language-specific skill, one that requires experience with a specific language and the ways in which it maps onto that particular orthography in order to be used in reading that language. If this is the case, then morphological awareness should make robust contributions to reading within a single language that do not cross over from one language to another. If, instead, morphological awareness is a broader conceptual meaning understanding - for example, that words are made up of units of meaning regardless of the specific language- then there should be evidence of cross-linguistic transfer to reading, particularly across orthographies in which morphemes determine, at least in part, the ways in which language is represented in the script." (Deacon et al., 2006, p. 733)

It can be argued that students of French immersion programmes who might have less developed syntactic and morphological skills, could experience more difficulty on text comprehension in school subjects. They could drop out of the programme prematurely (Hogan \& Harris, 2005).

In Bernhardt's (2005) compensatory model of second language reading, the second language knowledge dimension 'grammar form' includes linguistic features such as morphology and syntax. In the empirical studies some authors used misnomers. Grammatical awareness, morphological awareness and syntactic awareness were used interchangeably. Authors occasionally used only one task to assess what they called syntax and morphological knowledge. In addition, empirical evidence in second language research is more extensive on the role of syntactic awareness than of morphological awareness in reading. In the literature review following, the role of syntactic awareness and morphological awareness in first and second language word reading and reading comprehension will be addressed separately. I will note in parenthesis how the authors called the measure or how it was assessed, if misnomer exists.

### 2.2.5.1 The Role of Syntactic Awareness in Reading

Empirical evidence in English first language studies shows that syntactic awareness predicts the development of word recognition skills in reading (Tunmer, 1989) and reading comprehension (Cain, 2007; Oakhill et al., 2003). Tunmer (1989) was the first to emphasize the importance of grammatical skills (actually syntactic awareness as measured by correcting errors of word order in spoken sentences) to word reading in 100 Grade 1students and one year later. Syntactic awareness also influenced listening comprehension. Syntactic awareness along with word decoding influenced reading comprehension.

Oakhill et al. (2003) examined in 102 Grade 1 and 2 students predictors of word reading and reading comprehension. The predictors included vocabulary (PPVT), phonological awareness, verbal and non-verbal intelligence (WISC-R), working memory and syntactic awareness. Syntactic awareness was measured through a test of reception of grammar. The participant had to read aloud a sentence and point to one of four pictures that corresponded to the sentence read. Reading comprehension was assessed in three broad areas: (a) inference and literal skills, (b) story structure, and (c) comprehension monitoring. Inference and literal measures included, whether or not given sentences were the ones that occurred in the texts read. In the story structure measure, participants had to explain the story title and arrange sentences in the correct order). The purpose of comprehension monitoring was to identify in a text with conflicting information the part that did not make sense. Results showed that syntactic knowledge was uniquely predictive of reading comprehension in later primary grades (8 years old).

Similar results were found in Hebrew first language (Bentin, Deutsch, \& Liberman, 1990) with students 9 to 14 years old. It should be noted that this study did not systematically control for extraneous factors such as IQ and memory. Analyzing the outcome data is difficult as
the relationship between syntactic skills and reading comprehension may be due to working memory. This would add a third factor to those listed above.

A study involving children aged 7-8 and 9-10 years old in England examined if syntactic awareness shared a specific relation with word reading and reading comprehension (Cain, 2007). Variables such as IQ, memory and also vocabulary were controlled. Two different measures were used to test syntactic awareness. A grammatical correction task (morphology) was used where participant had to fix wrong sentences (e.g., "The girls climbs the tree"). In addition, a word-order correction task (syntax) was also used. Only the older participants were administered the grammatical correction task. To test reading abilities, a reading comprehension and word reading tasks were also administered. Participants had to read texts increasing in length. After each text a set of literal and inferential questions were asked. The test also provided a word reading score based on the number of word reading errors made.

Results from fixed-order hierarchical multiple regressions showed that the word-order correction task was a unique predictor of word reading for the older participants (9-10 years). However, the word-order correction task did not predict reading comprehension for both the younger ( $7-8$ years) or older (9-10 years) participants. Similarly, the grammatical correction task (morphology) was not a unique predictor of variance in word reading or reading comprehension for the 9-10 years old. In the 9-10 years grouping, Cain (2007) found that the correlation between syntactic awareness and reading comprehension might arise because of variance shared with vocabulary and working memory skills. There was also evidence that word reading and syntactic awareness share a unique variance that is not explained by vocabulary or memory. Word-order and grammatical correction tasks tap into different additional skills. Word-order correction is more dependent on memory than grammatical correction tasks (Bowey, 1986, 1994a). Thus, the two measures of grammatical awareness are not equivalent. The presence or absence of
relationship between grammatical awareness and word reading and reading comprehension may depend on which task is used to assess grammatical awareness: morphology or syntax. It may also depend on how it is related to memory.

However, in French as a first language studies where working memory and vocabulary have been taken into account, syntactic knowledge still predicted reading comprehension (Demont \& Gombert, 1996; Gaux, 1996; Gaux \& Gombert, 1999a, 1999b; Ziarko \& Mélançon, 1999). In France, Demont and Gombert (1996) followed 23 French speaking Grades 1 to 3 students. During a three-year longitudinal study, Demont and Gombert (1996) examined the role of phonological awareness, syntactic awareness and non-verbal intelligence in recoding abilities and reading comprehension. Phonological awareness consisted of a syllabic and phonemic deletion, and counting tasks. Syntactic awareness tasks included: (a) lexical segmentation of sentences (counting and pronouncing words in sentences, e.g., "le papillon vole - the butterfly is flying"), (b) grammatical judgment (judging if sentences are correct, e.g., "Elodie met sa manteau - Elodie is putting on her coat"), (c) grammatical correction (correcting agrammatical sentences mentioned in the grammatical correction task), and (d) grammatical correction of asemantic and agrammatical sentences (correcting agrammaticality of asemantic and agrammatical sentences without correcting the asemantic anomaly ${ }^{7}$, e.g., Blanche-Neige est $u n$ sorcier - Snow-white is a wizard"). Although the authors call these tasks syntax, they appear to have more to do with morphology.

Non-verbal intelligence was measured with Raven's Progressive Matrix. Word reading was measured by recoding abilities. It consisted of reading a 265 -words text with infrequent and irregular words calculating the number of errors in reading words and the reading speed. Reading comprehension was measured by Khomsi's (1990) comprehension test. The reading

[^5]comprehension task consisted of reading a sentence and designating the picture (among four) which corresponds to the sentence.

Results from fixed regression order showed that at the beginning of first grade, phonological awareness and syntactic tasks measured by grammatical correction of asemantic and agrammatical sentences (morphology) predicted recoding abilities. However, in Demont and Gombert's (1996) study, the predictive power of the syntactic task measured by grammatical correction of asemantic and agrammatical sentences (morphology) in word reading abilities disappeared in favor of phonemic measures. Phonemic measures predicted later reading abilities up to Grade 3. The predictive power changed in function of the timing of metalinguistic and reading evaluations. Demont and Gombert's (1996) reasoned that the phonemic tasks may have been too difficult for the participants at the beginning of first grade.

In addition, Demont and Gombert (1996) carried out stepwise regressions in Grade 2 and 3 to establish predictors of reading comprehension. Results showed that two of the syntactic tasks, lexical segmentation and grammatical correction, predicted reading comprehension at the end of second and third grade after controlling for vocabulary and IQ. Similar results were found by Gaux (1996) with Grade 6 students using the same measures as Demont and Gombert (1996).

Syntactic awareness tasks also predicted reading comprehension in a different francophone context (Ziarko \& Mélançon, 1999). The Ziarko and Mélançon (1999) study found that syntactic abilities with Francophone in the province of Quebec were also associated with reading comprehension performance at the end of Grade 1. The study also ruled out the possible effects of other variables, including intelligence and vocabulary levels. As in English first language (Cain, 2007), the relationship between syntactic awareness, word reading and reading comprehension may depend on which task is used to assess syntactic awareness.

However, in a number of second language studies (Durgunoğlu et al., 1993; Geva, 2000;

Gottardo et al., 2001), syntactic awareness was not found to predict literacy skills of second language learners of English. Syntactic awareness tasks require a degree of language proficiency. Because of this, syntactic tasks are likely to be more challenging for second language than first language learners. Several studies have shown poor second language syntactic awareness on the part of second language learners compared to first language learners (Chiappe \& Siegel, 1999; Da Fontura \& Siegel, 1995; Droop \& Verhoeven, 2003; Jongejan et al., 2007; Lesaux et al., 2006).

In a recent longitudinal study over two years, Jongejan et al. (2007) tested and compared two groups of Grade 1 and 4 students. Participants were composed of native speakers of English and English second language speakers. The tasks included phonological awareness, word and pseudoword reading, verbal working memory, spelling, lexical access and syntactic awareness. Syntactic awareness skills were assessed with a syntactic error judgment task. In this task, the participants were asked to decide if sentences were correct or not, e.g., "The boy be sad" (morphology). Results from a multivariate analysis of variance showed that native speakers performed the strongest on measures of syntactic awareness and verbal working memory. The participants with the least exposure to English (English as a second language) showed poor performance on the same two measures.

In a French second language study, excluding French immersion, Lefrançois and Armand (2003) investigated the role of syntactic awareness in reading. The study was conducted with Spanish immigrants studying in French schools in the province of Quebec. Lefrançois and Armand (2003) examined 38 native speakers of Spanish age 9 to 11 (Grades 4 to 6) after approximately 7 months of French instruction. The study explored contribution of phonological awareness, syntactic awareness and oral competence in word reading and reading comprehension. All the tasks were in French. Syntactic awareness was assessed using four tasks
adapted from Gombert, Gaux and Demont (1994) and Ziarko and Mélançon (1999). These tasks included: (a) sentence repetition, (b) grammaticality judgment (whether sentences were grammatical, e.g., Le marchand vendre beaucoup de fleurs - The merchant to sell lots of flowers"), (c) correction (correct grammatical error only in the sentences presented in the grammaticality judgment task, e.g.. "Le marchand vend beaucoup de fleurs - The merchant sells beaucoup de fleurs"), and (d) error replication (identify the grammatical error in four target sentences, for e.g., wrong-subject-verb agreement, and for each one produce the same error in two sentences). Although the authors call these tasks syntax, they appear to have more to do with morphology. Oral competence was assessed through various aspects of oral comprehension such as morphology, syntax and vocabulary knowledge (Carrow-Woolfolk, 1985). Participants had to choose the image corresponding to the stimulus item. Reading included decoding (reading list of proper nouns) and word recognition (word-image pairs). It also included sentence comprehension adapted from Khomsi (1990) and expository text comprehension (oral recall of propositions and arguments).

The Lefrançois and Armand (2003) study found that "this is the first time in second language that a strong correlation has appeared between syntactic awareness and reading comprehension. Oral competence shows a correlation as strong as syntactic awareness" (p. 238). Results from multiple regressions showed that although adding metalinguistic variables to the regression model significantly increases the percentage of variance explained, the most strongly associated variable is oral competence. The capacity to understand the second language orally (as measured by vocabulary, syntax and morphology) best explains the ability to understand written sentenees in Freneh. Lefranȩois and Armand (2003) concluded that being able to reflect on the syntax of the second language is related to the capacity to understand written sentences in French as a second language. Thus, syntactic awareness has an effect on French second language
reading comprehension.
The Lefrançois and Armand (2003) results pertaining to sentence and text comprehension are in line with those of French first language studies with Grade 1 students (Demont \& Gombert, 1996; Gaux \& Gombert, 1999a; Ziarko \& Mélançon, 1999). In the French first language studies in France (Demont \& Gombert, 1996; Gaux \& Gombert, 1999a) and in the province of Quebec (Ziarko \& Mélançon, 1999), syntactic awareness predicted reading comprehension. However, results of the Lefrançois and Armand (2003) study contradict an earlier study in the province of Quebec (Armand, 2000).

Armand (2000) analyzed if differences existed in the performance of 20 Grade 1 French second language students (allophones) and 19 Grade 1 Francophone students on linguistic, semantic, phonological, syntactic, oral competence, word reading and reading comprehension tasks in French. The semantic task measured the identification of the longest word in two pictures, e.g, "un train - a train; une coccinelle - a ladybug". Phonological awareness tasks included initial and final phoneme deletion in words and nonwords; but no syllabic measures. Syntactic tasks combined both a morphological task (correcting grammatical and agrammatical sentences, e.g., "ta maman sont jolie - Your mother are beautiful") and a syntactic task (ordering words). Oral competence was measured using a receptive vocabulary task (identifying among four pictures, the picture that corresponded to the word). Reading comprehension was measured through recalling and answering comprehension questions of a narrative text.

Results of multiple regression analyses revealed that phonemic abilities predicted $21 \%$ of the variance of word reading for allophone students and $43 \%$ for francophone students. Although Armand's participants were not identified as French immersion, they were since Kindergarten in a situation of "successive bilingualism" (p. 469). That is, students had neither English nor French as a first language which is in an increasingly similar situation of French immersion students in

British Columbia. Armand's results also showed that for allophone students the combined morphological and syntactic awareness tasks did not explain reading comprehension. Age may have influenced those findings in second language for the allophone students. It could be that older readers in the Lefrançois and Armand's (2003) study are more able to use syntactic awareness than younger readers in the Armand's (2000) study.

In the French immersion context, syntactic awareness has not been found to predict literacy skills of second language learners of French (Cormier \& Kelson, 2000). Cormier and Kelson followed 103 Grades 1 to 3 students in New Brunswick. The study examined the roles of phonological and syntactic awareness, verbal working memory and lexical access in spelling and word reading, but not reading comprehension in French immersion. Test administered in English and in French included spelling, word decoding and phonological awareness. Tests of cognitive skills (verbal working memory, rapid naming, visual-spatial reasoning and syntactic awareness) were administered only in English, the participants' first language, to obtain the best performance and due to time restrictions also. Syntactic awareness was assessed using a syntactic error judgment task in English (determining if a sentence was grammatically correct, e.g., "Last night, Johnny sleeps in his bed"). Sentences could be wrong because words were not in the correct order (syntax), function of words were incorrect (syntax), or verbs did not agree in tense or number with the subject (morphology). To assess French literacy skills, The French Immersion Achievement Word Reading Subtest (Wormeli \& Ardanaz, 1987) was used. Hierarchical regression analyses showed that phonological awareness explained a significant amount of variance of word decoding after taking into account the contributions of lexical access and verbal working memory. Syntactic awareness did not emerge as a predictor as shown by the weak performance of French immersion students on that task.

Syntactic awareness has been found to predict reading comprehension for native speakers
but not second language speakers. Some first language authors, Gottardo et al. (1996) have hypothesized that problems at the phonological level could slow down high-level processes and hinder the role of syntactic awareness in reading comprehension. If the readers in second language have not yet automated low-level processes, it could hinder the use of their syntactic awareness in high-level processes. Syntactic awareness does not emerge as a strongly associated variable despite its correlation with reading comprehension. A higher level of bilingualism would perhaps be necessary to let syntactic awareness emerge as a predictor. A different syntactic awareness task may also lead to different results.

Morphology is the second linguistic feature of the second language knowledge dimension 'grammatical form' in Bernhardt's (2005) compensatory model of second language reading that plays a role in word reading and reading comprehension.

### 2.2.5.2 The Role of Morphological Awareness in Reading

A growing body of evidence shows that morphological awareness is important when the reader is reading for meaning. Morphological awareness contributes to reading development in English monolingual students (Carlisle, Beeman, Davis, \& Spharim, 1999; Deacon \& Kirby, 2004; Mahony et al., 2000) and in French monolingual students (Casalis \& Louis-Alexandre, 2000; Plaza \& Cohen, 2003). Morphological awareness also contributes to reading development across a range of alphabetic and non alphabetic orthographies (Abu-Rabia et al., 2003; McBrideChang et al., 2005; McBride-Chang et al., 2003) and second language learners (Bindman, 2004; Deacon et al., 2007; Droop \& Verhoeven, 1998b; Wang et al., 2006). As the present study pertains to French immersion students, my literature review will only cover the studies that are pertinent to French monolingual and learners of a second language (French or other languages).

Contrary to a growing body of evidence that morphological awareness contributes to word reading in English first language, there is some limited empirical evidence that
morphological awareness and reading development are related in French first language (Casalis \& Louis-Alexandre, 2000; Plaza \& Cohen, 2003). Plaza and Cohen (2003) undertook a study with 267 French speaking Grade 1 monolingual students. Plaza and Cohen examined the role of different variables in both word and pseudoword reading (Mousty et al., 1994) and reading comprehension (Khomsi, 1999). Phonological awareness was assessed using initial phoneme deletion and syllabic inversion tasks. Syntactic awareness assessed both syntax and morphological knowledge (a sentence judgment/correction task). Other variables included naming speed, auditory sequential memory (digit repetition task) and dictation spelling. A composite measure of word reading and reading comprehension was created. Results from hierarchical regression analyses showed that morphological awareness accounted for unique variance (2\%) in word reading and reading comprehension after variance in phonological awareness (14\%) and naming speed (8\%) had been controlled for. These findings provide some evidence that morphological deficits may be relevant to reading.

Similarly, Casalis and Louis-Alexandre (2000) in a longitudinal study from Kindergarten to Grade 2 examined the relationship between morphological awareness, phonological awareness, receptive vocabulary, word decoding and reading comprehension in 55 monolingual French speakers. Phonological awareness was measured using a rhyme choice test, a phoneme deletion test and a syllable deletion test. Morphological awareness was assessed using sentence completion with an affixed word (e.g., contrary to 'coller' is 'décoller') and an affixed pseudoword task. The morphological awareness task also included a morphemic synthesis task (pronouncing a whole word given root and affix) and an inflectional morphology task (feminine e.g., 'bon/bonne', verb/tense words (e.g., 'il chante/il chantait'). Reading comprehension was assessed in Grade 1 and 2 using a French standard reading test (reading aloud a text, accounting for speed and accuracy). After controlling for IQ and vocabulary differences, regression analyses
showed that morphological awareness in Grade 2 predicted reading comprehension in Grade 2. However, morphological awareness in Grade 1 did not predict reading comprehension in Grade 2.

The results from Casalis and Louis-Alexandre (2000) are different from Plaza and Cohen (2003) at the Grade 1 level. Casalis and Louis-Alexandre (2000) used a morphological task in Grade 1 with a reading task alone. Plaza and Cohen (2003) assessed both syntax and morphological knowledge in Grade 1. Despite these differences, morphological awareness appears to play a role in reading development in French. Studies with participants who are developing second language skills (Bindman, 2004; Deacon et al., 2007; Droop \& Verhoeven, 1998b; Wang et al., 2006) are more limited. Still, morphological awareness appears to play a role in reading development of second language learners.

Droop and Verhoeven (1998b) examined the role of morphological awareness of 70 Grade 3 students acquiring literacy in Dutch as a first and second language (with Turkish and Moroccan as first language). Droop and Verhoeven (1998b) used a task that combined morphological awareness and syntactic skills. Similarly to first language research, Grade 3 students in the Droop and Verhoeven's study appeared to use both morphological and syntactic knowledge when reading in a second language.

Bindman (2004) examined the same relationship in 116 individuals (6-10 years) with English as a first language and learning Hebrew as a second language in two Jewish schools in the United Kingdom. Participants were given vocabulary and oral and written morpho-syntactic awareness tasks in both languages. Oral-cloze in English required the use of syntactic, morphological and semantic information to complete sentences (e.g., "The boy $\qquad$ down and hurt his knees."). Missing word included nouns, adjectives prepositions, conjunctions, interrogatives and verbs. After controlling for age and vocabulary, multiple regression analyses
revealed "cross-language relationships between oral morpho-syntactic task, suggesting a transfer between first and second language" (Bindman, 2004, p. 691). Second language morphological knowledge (e.g., of the written three-consonant Hebrew root) was also related to first language morphological spelling. The relation provided evidence that knowledge of morphological principles acquired in one language could also be used for spelling in another language. For example, words that come from the same root are spelled similarly.

Similar results were found in the context of reading as an interactive process in the acquisition of two distinct writing systems, Chinese and English (Wang et al., 2006). In the context of Chinese-English biliteracy acquisition, Wang et al. (2006) studied the contribution of morphological awareness in 64 Grade 2 and 3 Chinese immigrants in the Washington area of the United States. The tasks in Chinese and English were comparable. They included morphological awareness, phonological awareness, oral vocabulary, word reading and reading comprehension. Morphological awareness in English was assessed using a compound-structure and a derivational-morphological task.
> "Compounding and derivational are two important types of morphological structure in English. Compounding task refers to the formation of a new word by combining two or more stem morphemes, whereas derivation involves construction of a new word by adding a morpheme (affix) to change the meaning of a stem morpheme."(Wang et al., 2006, p. 545)

In the compound-structure task, the participant was first asked to choose the better answer to two riddles presented orally (e.g., "Which was a better name for a bee that lives in the grass: a grass bee or a bee grass?"). The participant was then asked to choose a best compound name among four choices for a short description (e.g., "If you found a lid for a dish to keep candy in, what would it be called: dish lid, candy dish lid, dish candy lid, or candy lid dish?"). In the derivational-morphological task, the participant was asked to complete a sentence based on a clue word, which was a root word (e.g., For the clue word 'farm', the sentence to be completed
was " My uncle is a $\qquad$ " (farmer)). Reading comprehension was assessed using the Wide Range Achievement Test-Expanded Edition (WRAT-E).

Results from hierarchical regression analyses in the Wang et al.'s (2006) study revealed that English derivational morphology predicted English word reading (accounting for 10\% of the variance) and English compound morphology predicted Chinese character reading (accounting for $3 \%$ of the variance). The analyses also showed that English compound morphology predicted English reading comprehension (accounting for $6 \%$ of the variance) and Chinese reading comprehension (accounting for $11 \%$ of the variance). However, Chinese morphological awareness did not predict English reading comprehension. Chinese and English have quite different orthographies. Wang et al.'s (2006) results suggest different findings from the Comeau et al. (1999) cross-linguistic study. Comeau et al.'s (1999) research on phonological awareness between English and French demonstrated transfer in both directions since English and French have a 'closer' orthography but he same is not true between English and Chinese.

Deacon et al. (2007) examined the role of morphological awareness in reading in the context of French immersion in Ontario. A total of 58 Grades 1 to 3 students were tested. French measures tested included word reading, vocabulary, phonological awareness and morphological awareness. Word reading was assessed using the French Immersion Achievement Test (Wormeli \& Ardanaz, 1987). Vocabulary was measured through the French version of the PPVT-R (Dunn, Thériault-Whalen, \& Dunn, 1993b). Phonological awareness consisted of phoneme counting in Grade 1 and phoneme deletion in Grades 2 and 3. Morphological awareness was assessed using a sentence analogy task where past and present tenses were manipulated, e.g., "Je connais ce garçon" changed to "Je connaissais ce garçon"). Similar tasks were used in English.

Results from hierarchical regression analyses determined that measures of English morphological awareness were significantly related to both English and French word reading.

The Deacon et al. study (2007) seems to suggest that first language morphological awareness plays a role in French and English word reading. This role is also extended with second language morphological awareness.

All of the studies were either done in French in a francophone context or in a French as a second language context. Testing was done in the provinces of Quebec, Ontario or New Brunswick. The province of Quebec is predominantly French speaking and New Brunswick is the only official bilingual province in Canada. No study has yet been undertaken in the context of French immersion in British Columbia. British Columbia is predominantly English speaking. French as a second language is often not available in the communities within the province. Grammar (morphology and syntax) is not taught systematically in the British Columbia elementary curriculum. Therefore, limited morphological and syntactic awareness in second language might influence the ability to comprehend course materials in French immersion such as in Science and Social Studies. Morphological awareness might play an important role in French immersion students' reading comprehension in British Columbia.

However, reading in a second language should not solely comprise mastering new vocabulary and expressions and morphological structures. It should also integrate some cultural background knowledge elements. The cultural knowledge elements are entwined with the target language itself. Reading comprehension can be impaired when considerable culture specific knowledge is incorporated in a text. Bernhardt (2005) has identified as part of her compensatory model of second language reading 'content knowledge' as a variable that may come to play in second language reading comprehension(see section 2.1.3.1). Content knowledge has also been referred to as world knowledge (Bernhardt, 1991b) of the content area of the text (see section 2.1.2.3). It includes culture specific knowledge or cultural knowledge of the target culture.

### 2.2.6 Second Language Cultural Knowledge

Second language instruction has traditionally been seen as limited to the linguistic elements of the language. Language knowledge involves not only knowing the language but also knowing how to use the language. Knowing how to use a language is for the most part related to culture and the relation between language and culture has become even more important in a bilingual and even multilingual country like Canada. Language awareness and cultural awareness go hand in hand. This is especially true for French immersion students because the second language is not only explicitly taught. It is also the medium of the curriculum instruction. In order to learn the content of the subject matter being taught in French students need to understand what they are reading. French immersion learners necessarily become learners of the second culture because a language cannot be learned without an understanding of the cultural context in which it is used. Effective reading comprehension is more than a matter of language proficiency. However, successful reading comprehension seldom occurs unless second language users have obtained some second language cultural knowledge associated with that second language. For the participants of the present study, second language cultural knowledge constitutes an important element in considering the relationship of reading comprehension in a second language.

Section 2.2.6.1 will briefly review the concept of culture in second language. Section 2.2.6.2 will define second language cultural knowledge for the present study and explain its importance in reading comprehension. Section 2.2.6.3 will present the empirical research's findings of the role of second language cultural knowledge in reading comprehension.

### 2.2.6.1 The Concept of Culture

Culture has been conceptualized in many different ways in Applied Linguistics. As with reading theories, the concept of culture has shifted and transitioned through theoretical perspectives. Defining culture is theoretically complex.

Linguists and anthropologists have long recognized that the forms and uses of a given language reflect the cultural values of the society and the social practices in which the language is spoken. In the 1970's, the anthropologist Geertz (1973) provided the best-known definition of culture at that time. Geertz (1973) defined culture as "an historically transmitted semiotic network constructed by humans and which allows them to develop, communicate and perpetuate their knowledge, beliefs and attitudes about the world" (p. 89). Language is not only part of how we define culture, it also reflects culture.

Language learning and culture learning have traditionally been isolated from one another with primary emphasis on language learning. Culture learning occurred after or around language learning. Only rarely was culture seen as fostering language learning. Culture study has been driven by an add-on approach with culture learning being information-centered. For example, second language instruction in the 1960's has traditionally relied on the distinction between the humanistic concept of Big C and the more pragmatic concept of small c (Brooks, 1968). Big C was related to great works of art or literature in teaching language (civilization) and small $c$ was related to everyday life interactional encounters and etiquette. This distinction prevented any interrelationships that could explain the coherence of the value systems of the language society being studied. Culture was seen as more complex than the Big C-small c distinction, the four Fs (foods, fairs, folklores and statistical facts), the three Cs (civilization, celebrations, community) and the three Ps (perspectives, practices and products).

However, the culture associated with a language cannot be learned in a few lessons about celebrations, folk songs or costumes of the area in which the language is spoken. Culture is dynamic. Bennett (1993) defined culture in terms of objective culture and subjective culture. Objective culture is being defined as both cultural creations (including institutions) and artifacts of formal culture (eating, behavior, etc.). Subjective culture is being defined as language use,
nonverbal behavior, communication style, cognitive style and cultural values. Such perspective avoids the conflicts and separations that arise in the Big C-small c, four Fs, three Cs, or three Ps culture distinctions. The objective/subjective culture perspective does not view culture simply as information or as cultural practices such as food and leisure activities that are heavily encoded in noun. Culture is also seen as a belief system subcoded in nuances of adjectives choices, appraisal systems, voice and tone. Conceptually, this cultural perspective situates language within a cultural framework that takes into consideration individual mental processes (a person's perceptions and judgments) as well as the interaction between individuals in a society.

It can be argued that a person's perceptions and judgments are influenced by the assumptions shared by the groups to which the person belongs. In this modern perspective, culture can then be viewed as integrated patterns of learned behavior (Pritchard, 1990; Sharifian, 2003). Culture is defined as an "integrated pattern of human behavior that includes thoughts, communications, languages, practices, beliefs, values, customs, courtesies, rituals, manners of interacting and roles, relationships and expected behaviors of a racial, ethnic, religious or social group" (Goode, Sockalingam, Brown, \& Jones, 2000, p. 1). In this view, culture is seen as the knowledge, skills, attitudes, values, needs and motivations that shape an individual's ability to operate in the cultural setting in which he/she exists. This definition encompasses both the notion of cultural perspectives and practices. In this context, cultural practices include popular beliefs, commonly upheld values, shared attitudes and widely maintained assumptions of the members of a culture. Cultural practices comprise the use of forms of discourse including vocabulary. Thus, second language cultural knowledge involves knowing how to speak and how to use the second language appropriately.

Culture is a much broader concept that is tied to many of the linguistic concepts taught in second language classes. Linguistic competence alone is not enough for learners of a language to
be competent in that language. Kramsch (1993) emphasized that the impact of culture on language learning and use is complex. In her book Context and Culture in Language Teaching, Kramsch (1993) stated "if language is seen as social practice, culture becomes the very core of language teaching. Cultural awareness must be viewed both as enabling language proficiency and as being outcome of reflection on language proficiency" (p. 8). Second language learners necessarily become learners of the second culture. A language cannot be learned without an understanding of the culture context in which it is used.
"Through the study of a second language, students gain knowledge and understanding of the second culture that use that language, which is known as cultural knowledge. In fact students cannot truly master the language until they have also mastered the cultural contexts in which the language occurs." (National Standards in Foreign Language Education Project, 1996, p. 27)

Language learners need to be aware of and understand the culturally appropriate ways to address people, express gratitude, make requests and agree or disagree with someone. Language learners should know that members of the target language community might not perceive behaviors and intonation patterns positively even though they might be appropriate in their own speech or written community. Language learners have to understand that language use must be associated with culturally appropriate behavior. The main hypothesis is that effective comprehension is more than a matter of language proficiency. Successful comprehension seldom ever takes place unless second language users have obtained some cultural competency of the language they are using.

Meaningful cultural communication depends on the achievement of an ability to understand different modes of thinking and living, as they are embodied in the language to be learned.

Byram's (1997) theory was a precursor of the notion of intercultural communication.
Intercultural communication involves multiple knowledge such as how to be, how to think, how to behave and cooperate across cultural boundaries and in different cultural contexts.

Intercultural communication also involves the ability to merge or mediate between different modes present in any specific interaction. This mode of understanding has been labeled as intercultural communicative competence.
"Each individual forms relationships with a widening cluster of overlapping social groups, which together define identity. In an intercultural approach, it is a central objective of language education to promote the favorable development of the learner's whole personality and sense of identity in response to the enriching experience of otherness in language and culture." (Council of Europe, 2001, p. 1)

Intercultural competence helps students to develop an understanding of the ways in which people of another culture speak and behave. Intercultural competence enhances communicative competence in every sense: listening, speaking, writing or reading. Cultural awareness is a goal when learning another language and its culture. This is even more important to increase French immersion students' awareness and to develop their interest and ability towards the target culture. In the French immersion context, students learn the second language as early as Kindergarten and use it as their language of communication. These comparisons between one's own and target culture are not meant to underestimate or overestimate foreign cultures but to enrich students' experience and knowledge of the second culture.

The Common European Framework, as part of its focus of the European Research Programme Processes of Language Acquisition in Multiple Environment, has emphasized intercultural sensitivity as one of the five goal areas in understanding a second language and culture. "Intercultural sensitivity among which cultural knowledge, labeled as knowledge of the world" (Council of Europe, 2001, p. 101). Knowledge of the shared values and beliefs held by social groups in other countries and regions is essential to intercultural communication. Any new knowledge is not simply added onto the knowledge one had before but is conditioned by the nature, richness and structure of one's previous knowledge. The knowledge that an individual
has already acquired is directly relevant to language learning.
"However, in certain contexts (e.g. immersion, attending school where the language of tuition is not one's mother tongue), there is simultaneous and correlated enrichment of linguistic and other knowledge. The learner of a second or foreign language and culture does not cease to be competent in his or her mother tongue and the associated culture. Nor is the new competence kept entirely separate from the old. The learner does not simply acquire two distinct, unrelated ways of acting and communicating. The language learner develops interculturality." (Council of Europe, 2001, p. 102)

The linguistic and cultural knowledge contributes to intercultural awareness. Intercultural awareness has been defined as "knowledge, awareness and understanding of the relation (similarities and distinctive differences) between the world of origin and the world of the target community" (Council of Europe, 2001, p. 103). Intercultural awareness enables the individual to develop greater openness to new cultural experiences. More difficult to bridge are differences in values and beliefs, politeness conventions and social expectations unless they have acquired the relevant intercultural awareness. It is important to note that intercultural awareness may also include an awareness of regional diversity in both worlds. This may be the case within different francophone contexts, for example the province of Quebec and France. In addition to objective and subjective knowledge, intercultural awareness covers an awareness of how each community appears from the perspective of the other, often in the form of regional or national stereotypes.

### 2.2.6.2 The Concept of Second Language Cultural Knowledge and its Importance

## in Reading Comprehension

The definition of second language cultural knowledge chosen for this research is based on the recent perspective in Applied Linguistics for rethinking the relationship of language and culture in second language education (Zarate, Lévy, \& Kramsch, 2007). A definition that is operationalized on three levels: schema, vocabulary and consideration of values and attitudes of the target cultural group (Tang, 2006).

For the present study, second language cultural knowledge is defined as the vocabulary that reflects the culture of the second language. More specifically, second language vocabulary that reflects the thoughts, practices, beliefs, values, customs, courtesies, rituals, manners of interacting and roles, relationships and expected behaviors of the second language culture, i.e., the francophone culture. In the course of acquiring functional language abilities, second language students acquire among others, language awareness, meaning interpretation and cultural awareness, and sensibility (MLA Ad Hoc Committee on Foreign Languages, 2007).

Research indicates that reading comprehension results from the integrative interaction between derived textual information and preexisting knowledge (Nassaji, 2007). Appropriate schemata must exist and must be activated during text processing. If not, a mismatch will occur between what the writer anticipates the reader can do to extract meaning from the text and what the reader is actually able to do. This will result in various degrees of non-comprehension.

When second language readers concentrate only on the information contained in the story, readers attribute their failure to get the point to another lack of information, namely their deficient knowledge of the second culture. Kramsch (1993) states further that "In fact what they are missing is not an even greater amount of information, but awareness of their own frame of reference and of their dialogue with the text during the reading process" (p. 124). Research into second language reading comprehension does indicate that comprehension is a function of the use of multiple sources of knowledge. Comprehension can be impaired when considerable culture specific knowledge is incorporated in a text and the second language readers do not possess the presumed second language cultural knowledge. Second language readers will then draw on their first language cultural knowledge to interpret less familiar elements encountered during the reading exercise.

Gaps in cultural schemata may lead to gaps in comprehension. Second language readers often do not possess the language background to interpret less familiar elements encountered during the reading exercise (Carrell et al., 1988; Maria, 1990). "In terms of interactive model, what it amounts to is that there is a level below which a deficit in one component cannot be compensated for by a corresponding strength in another" (Urquhart \& Weir, 1998, p. 72). Many second language learners may compensate for limitations in second language knowledge by relying on their content schema (Carrell, 1981a, 1981b, 1987; Connor, 1984; Johnson, 1981; Parry, 1987; Perkins \& Angelis, 1985). Content schemata include second language cultural knowledge. This may be a successful coping strategy if the readers are familiar with the cultural content. If they are not, the extent to which their problems with background knowledge may be due to other factors has been left unanswered.

Elements of culture that are crucial to understanding a reading text depend on the definition of reading comprehension. If reading comprehension only means understanding what took place in the story, who did what to whom, when and where, then elements of culture are not important in understanding a story. If reading comprehension also includes the reconstruction of a message encoded by the writer, then elements of culture are important in understanding a story. In order to interpret the message as it was intended to be understood, there are two layers of meaning crucial to understanding a text. The reader is led to the whole explicit meaning (who? what? where?) and the implicit meaning of the text (why? how?). It is implicit meaning of the text which is drawing on textual and cultural inferences. Implicit meaning of a text is the most difficult for second language students. Textual inference deals with reading ability, whereas cultural inference depends on the ability of the students to identify with the situation or characters in a second language setting.

### 2.2.6.3 The Role of Second Language Cultural Knowledge in Reading

## Comprehension

During the process of comprehending written text, readers use their knowledge of the world as well as their knowledge of the language to construct meaning from the text. In this way, it is possible to build a representative model of the text. When a reader's background knowledge is similar to the knowledge presupposed by a text, the interpretation of the text may be close to what the author intended.

A substantive body of research has emerged to indicate the likelihood that second language learners understanding of conceptualizations and constructs in a second culture is fundamentally affected by their culturally defined worldviews, beliefs and assumptions. The empirical research from the 1970's to the present time on the role and effect of cultural knowledge in second language reading comprehension was conducted mainly in English as a second language context and with adult participants. Only a few had young individuals as participants. For the purpose of this research, only those studies investigating the role of content schemata (which include second language cultural knowledge) in second language reading comprehension with young readers will be examined. References to second language and/or first language studies with adults will only be made if appropriate. Studies will be presented in sections 2.2.6.3.1 to 2.2.6.3.3 according to three categories. The categories include: (a) studies examining cultural schemata according to ethnic background, (b) studies investigating the manner and type of background knowledge given to readers to increase comprehension of culture specific text, and (c) studies examining topic knowledge/familiarity.

### 2.2.6.3.1 Cultural Schemata and Participants' Ethnic Background

Studies undertaken mostly with adults showed that readers did better in reading comprehension and recall on materials for which they had the appropriate cultural schemata.

Readers with cultural knowledge scored higher on reading comprehension tests.
Kintsch and Greene (1978) examined the impact of cultural background knowledge in the process of reading comprehension. In the Kintsch and Green study, American college students read two stories: a Grimm fairy tale and an Apache folk tale. Recall protocols indicated that the American students had better recalled with the Brothers Grimm story than with the Apache folk tale. Two criticisms emerged from this study. There was no control group of American Indian participants. It is presumed that the American Indian participants would have found the American Indian text easier to comprehend than the European text because of prior familiarity with the rhetorical organization and content. Another criticism of this study was the failure of Kintsch and Greene (1978) to distinguish content from formal schemata. Not only did the European and American Indian texts differ in rhetorical organization, they also had different cultural contents. It was possible that the American participants were simply more familiar with the cultural content of the Grimm's fairy tale, including the objects and events in the tale, than they were with the content of the Apache text.

In an effort to eliminate this possible bias, Steffensen, Joag-Dev and Anderson (1979) designed a study with two groups of participants with different cultural heritages. One was a group of students from India living in the United States of America. The other was a group of mainstream Americans. Participants in each group were asked to read and recall two passages with different cultural content. One passage, in the form of a letter, described a traditional wedding in India. The other passage described a traditional American wedding. Since the wedding is a ceremony of social importance, it was assumed by the authors that all adult members of a society would have a well-developed system of background knowledge. All participants would be familiar with the marriage customs of their own culture. They would also exhibit a comparative lack of knowledge about the customs of more distant cultures with which
they were less familiar. In addition, syntactic complexity of each letter, which was written by a member of that culture, was controlled. Cultural knowledge in reading comprehension was tested by using reading time, written recall, recall of important vs. unimportant information and modification of text in recall. Free recall (number of idea units) and probe recall (through words that occurred in meaningful sentence contexts) data indicated the influence of cultural schemata in reading both letters. Results showed that both groups read faster and recalled more of the material pertaining to their own cultural background. Participants tended to distort the information from unfamiliar cultures. The Steffensen et al. (1979) study illustrated how cultural schemata can affect inferential and literal comprehension and recall of presented reading material. However, the Steffensen et al. (1979) study did not examine cultural variables interacting with second language factors.

Since this seminal study of Steffensen et al. (1979), research has also found that the cultural origin of text material has greater effect on reading comprehension than its linguistic complexity. Second language readers use different strategies when reading familiar and unfamiliar text. A set of studies has examined the role of cultural knowledge in the reading comprehension of second language learners. This set of studies can be subdivided into two categories: (a) studies keeping rhetoric structures of a text constant and manipulating the content, and (b) studies varying rhetoric structures of a text and manipulating the content.

### 2.2.6.3.1.1 Studies Keeping Rhetoric Structures Constant and

 Manipulating the ContentThe first set of studies kept rhetoric structures of a text constant and manipulated the content. The studies examined second language reading comprehension of adults using narrative texts (Bernhardt, 1985; Bernhardt \& Kamil, 1995; Kang, 1992; Lin, 2002; Steffensen, Goetz, \& Cheng, 1999; Yuet \& Chan, 2003), or expository texts (Malik, 1990). Most studies were
undertaken with university students in the English second language context. Bernhardt's (1985) and Bernhardt and Kamil's (1995) were in a German second language context with English as the first language.

In a recent study, Yuet and Chan (2003) provided Chinese/Hong Kong English as a second language university students with two texts. One text had cultural content familiar to Hong Kong (about symbols). The other text was culture free (about sleeping). Using cloze test, results showed that cultural knowledge on reading comprehension seemed to be more significant in second language reading relative to language proficiency. Intermediate university students relied more on background knowledge or cultural competence, than linguistic competence. Postintermediate university students were able to compensate for cultural knowledge with their linguistic knowledge.

Kang (1992) found similar results. Read aloud recall protocols demonstrated that Korean English second language graduate students, when they read unfamiliar words in English, relied on their Korean language and cultural schemata. Kang concluded that second language information might be filtered through the first language cultural knowledge or semantic interpretation. The activation and generation of culture-specific schemata and inferences at times significantly affected subject's comprehension.

All the above-mentioned studies ignored the fact that second language cultural knowledge also comprises affective and imagery aspects. From a somewhat different perspective Steffensen, Goetz and Cheng (1999) compared the quality and quantity of text-induced imagery and emotional responses among 64 English as a second language Mandarin learners in a Chinese university. The participants listed and ranked their mental pictures and affective responses after reading in Chinese and English a text describing a similar trip respectively in China and in the United States. Results showed that the perceptions of vividness of the participants' mental
images and the strength of their emotional reactions did not differ between the groups. However, a good deal more imagery and stronger emotional responses were reported by the group reading Chinese (first language) text. These findings seem to lead to two tentative conclusions. Mental images emerging from second language texts are less vivacious than those emerging from first language texts. Restricted imagery and affect can be formed in the absence of total understanding. It is not clear whether the limited imagery induced by the second language text is entirely attributable to insufficient second language cultural knowledge. Because the second language text required three times longer reading time, it may be that limited linguistic knowledge or a combination of insufficient linguistic knowledge and cultural unfamiliarity, accounted for restricted imagery during second language text processing.

### 2.2.6.3.1.2 Studies Varying Rhetoric Structures and

## Manipulating the Content

The second set of studies examined differed in that they varied rhetorical structures of a text, contrary to the first set that kept it constant and manipulated the content. These studies often provided both a complex and a simplified text in terms of linguistic and text structures. The majority of available studies (Carrell, 1981a, 1981b, 1987; Connor, 1984; Johnson, 1981; Parry, 1987; Perkins \& Angelis, 1985) tested adults. Campbell (1981) and Droop and Verhoeven (1998a) were the only two studies testing second language children exclusively.

Droop and Verhoeven (1998a) tested reading comprehension of Turkish and Moroccan Grade 3 students who were learning Dutch as a second language in the Netherlands. Participants were asked to retell Dutch expository texts reflecting Dutch culture (part of the Netherlands reading curriculum) as well as expository texts reflecting the Turkish and Moroccan culture. Reading comprehension was assessed through recall protocol, including questions prior and after reading. Droop and Verhoeven (1998a) found that Turkish and Moroccan participants who were
learning Dutch as a second language in the Netherlands performed significantly worse than Dutch Grade 3 students on texts from the Netherlands reading curriculum that emphasized Dutch culture. Droop and Verhoeven (1998a) attributed this to the nature of the texts (expository). Droop and Verhoeven reported that the linguistic complexity of an expository text compared to a narrative text, could impede readers' performance on culturally relevant texts. When the texts reflected the Turkish and Moroccan readers' culture and were linguistically simple, the Turkish and Moroccan participants performed significantly better than the Dutch participants. When the texts were linguistically complex, the differences were negated due to the Turkish and Moroccan readers' lower proficiency in Dutch.

The lack of knowledge of culturally determined knowledge, the linguistic complexity (the level of syntactic or semantic complexity) of a text and the nature of a text used for reading comprehension, such as expository texts, affect the comprehension of second language readers. Some researchers have questioned whether a support, such as pictures or culture-specific vocabulary, given before or during reading, could lead second language readers to achieve a better comprehension of culture-specific texts.

### 2.2.6.3.2 Manner and Type of Background Knowledge Given to

## Readers

Based on the psycholinguistic interactive view of reading, some studies supplied participants with prior knowledge, vocabulary or other forms such as pictures to see how it affects the reading comprehension of culture-specific texts. Some studies experimentally control the amount of background knowledge with adult readers (Gatbonton \& Tucker, 1971; Johnson, 1982). Other studies experimentally controlled the type of background knowledge with adult readers (Adams, 1982; Carrell, 1983a; Floyd \& Carrell, 1987; Hudson, 1982; Lee, 1986b; Omaggio, 1979; Ridgway, 1997). No studies were undertaken with elementary students as
participants.
Johnson (1982) conducted a study on advanced level English second language university students in reading. Participants had to read a text which contained sections of familiar and unfamiliar information about Halloween. Four groups of participants read the text with varying treatment conditions. Group 1 read a passage without a list of important vocabulary. Group 2 studied the definitions of target words before reading the passage. This group did not have the definitions while reading the text. Group 3 studied the target words before reading the text with key vocabulary also defined in the text. Group 4 had the benefit of prior study of word definitions as well as the words defined in the passage. University students were asked to participate in free recall and recognition tasks. Johnson (1982) found that cultural familiarity (i.e., knowledge about Halloween) was a more reliable predictor of recall performance than textspecific vocabulary knowledge among advanced English as second language learners. Readers recalled more propositions from the familiar than the unfamiliar portions of the text. Direct experience with the holiday festivities was more important to making familiar information easier to understand in a text. Johnson (1982) also found that varying the amount of vocabulary exposure did not produce a significant effect on recall. These conclusions matched those studies in English as a first language (Bransford \& Johnson, 1973; Stevens, 1982).

Other studies experimentally controlled the type of background knowledge with adult readers (Adams, 1982; Carrell, 1983a; Floyd \& Carrell, 1987; Hudson, 1982; Lee, 1986b; Omaggio, 1979; Ridgway, 1997). Several studies supplied readers with pictorial support to provide background knowledge (Adams, 1982; Carrell, 1983a; Hudson, 1982; Omaggio, 1979), Results of these studies were contradictory.

Both Omaggio (1979) and Adams (1982) found that the presence of a picture facilitated comprehension in a second language. Hudson (1982) also found differential impacts of such
support. Pictorial support appeared to be more efficacious for beginning and intermediate learners but a read/reread strategy was the most profitable for advanced students. In a related study, Carrell (1983a) found no impact on the recall stories of second language readers whether they had pictorial support or not. Carrell (1983a) further argued that induced schemata can compensate for many negative effects of participants' limitations in second language proficiency or limited ability of lower level reading skills.

Supplying participants prior or during reading with specific cultural vocabulary does not seem to enhance comprehension of adult second language readers. Supplying readers with pictorial support has also led to contradictory results.

### 2.2.6.3.3 Topic Familiarity and Related Proficiency Level

Studies examined the background knowledge component of topic with adults in relation of reading comprehension (Alderson \& Urquhart, 1988; Carrell \& Wallace, 1983; Mohammed \& Swales, 1984; Nunan, 1985; Olah, 1984; Zuck \& Zuck, 1984). Topic familiarity most often was a greater predictor of comprehension ability than text-based linguistic factors such as syntactic ease or explicit vocabulary knowledge. Sometimes individual vocabulary words - out of context - were misinterpreted when an understanding of a text was inexact. Incorrect schemata activated misinterpreted context as shown by incorrect word definitions.

Garcia (1991) conducted a study with elementary second language Grade 5 and 6 students. Garcia reported that even when Spanish-American speaking and monolingual Anglophone Grade 5 and 6 students had been in the same English-speaking classrooms for two years, they significantly differed in background knowledge for standardized reading test passages in English. The Spanish-American participants appeared to have less knowledge of specific topics. When differences in prior knowledge were controlled for, there was no significant difference in the two groups of participants' reading test performance. The Spanish-American
participants still scored significantly more poorly on questions that required them to use background knowledge. Garcia (1991) tested to see if the below average readers' literal interpretation of the text was due to the type of instruction they had received. Interview data with a subsample of the participants indicated that unfamiliar English vocabulary was the major factor that adversely affected the Spanish participants' reading test performance in English.

Similar results were found in other studies that examined the specific relationship between cultural schemata and vocabulary with younger readers (Campbell, 1981; Droop \& Verhoeven, 1998a; Jiménez et al., 1995, 1996). Campbell (1981) concluded that the major difference between learners is in the contextual area of reading. Absorbing the language and culture of the society in which the subject lives gave the native speaker a definite advantage in reading English texts. When the contextual framework is largely supplied within school situation and the language of the text is literal, the English as a second language learner coped adequately.

Topic interest may also be an important element to consider in the investigation of the role of second language cultural knowledge in reading comprehension. Several studies have examined diverse elements affecting the use of prior knowledge during second language text comprehension including second language proficiency (Hammadou, 1991; Ridgway, 1997). The research has focused on factors such as topic interest to explain the reported links between prior knowledge and comprehension. Contrary to first language studies (for example Adams, Bell, \& Perfetti, 1995; Anderson et al., 1977; Pearson et al., 1979; Stevens, 1980), second language studies (such as Bugel \& Buunk, 1996; Carrell \& Wise, 1998; Hammadou, 1990, 1991; LeLoup, 1993; Ridgway, 1997) that addressed comprehension relating to topic interest found contradictory results.

Readers' interest has been shown to positively influence second language reading comprehension for high school students in some studies (Bugel \& Buunk, 1996; Hammadou,

1991; LeLoup, 1993). Other research has tended to confound prior knowledge and topic interest under the label of 'topic familiarity' (Hammadou, 1991). Carrell and Wise (1998) found that 'the apparent impact of topic interests on reading comprehension is in reality a result of the fact that people tend to have more prior knowledge about topics in which they are interested" (p. 286).

Several factors have been shown to affect the comprehension of culture specific text of second language readers. These include lack of knowledge of culturally determined knowledge in addition to the linguistic complexity (the level of syntactic and/or semantic complexity), the nature of the text used to test for reading comprehension (expository texts appearing to be more difficult than narrative texts) and the topic interest. When choosing reading comprehension texts with cultural emphasis, particular attention needs to be paid to the interest that topic participants of both gender may have interest. This can be especially important if the interest content has a greater effect on average and below average readers. This may relate directly to the case of second language readers, such as in the French immersion context, compared to first language readers.

From the theoretical framework and the empirical research presented, several conclusions can be drawn.

Reading comprehension is a complex process that evolves through the interplay of numerous variables. Reading comprehension is an interactive and constructive process. Interactive models strongly imply that many lower level processing skills are needed for reading words and comprehending what is read. This literature review has highlighted studies that characterized reading as a complex, interactive and compensatory process involving cognitive, linguistic and cultural components. The review further identified a number of challenges to
second language young readers by discussing key variables that seem to influence word reading and reading comprehension.

In addition, phonological awareness predicts word decoding. Phonemic awareness was found to predict word decoding and word reading in French as a second language. However, phonological awareness did not predict reading comprehension in French as a first language. Phonemic awareness, in general, explained only a small percentage of the variance of reading comprehension in Grades 2 and 3 in French immersion. In English as a first language spelling, verbal working memory, vocabulary and morphology were the best predictors of reading comprehension.

Morphological awareness was found to predict French word reading and reading comprehension in French as a first language. Morphological awareness also predicted French word reading in the French immersion context. In one study in the French immersion context, verbal working memory was a better predictor of reading comprehension. Most of the studies mentioned were done in a francophone context, which is different than the French immersion context in British Columbia.

Second language cultural knowledge has also been identified as an important predictor of reading comprehension in second language. Having second language cultural knowledge implies better reading comprehension and the cultural origin of text has greater effect on reading comprehension than its linguistic complexity. Second language readers scored higher on recall recalled if the text used in testing was culturally more familiar. From interview data in one study, it was found that comprehension was affected by a lack of second language cultural vocabulary. The question of second language cultural knowledge as a variable has not been studied to date in the context of French immersion and is an area requiring further investigation. In the present study, second language cultural knowledge, as defined in section 2.2.6.2, is the cultural
vocabulary that reflects the thoughts, practices, beliefs, values, customs, courtesies, rituals, manners of interacting and roles, relationships and expected behaviors of the francophone culture. Second language cultural knowledge is of particular importance as French immersion students are faced with difficulty with content material they have to read when doing assigned exercises.

Therefore, it is intended that the present study will investigate the role of second language cultural knowledge in French immersion Grade 3 students' reading comprehension and in relation to the other variables. The following section outlines the significance of Bernhardt's (2005) compensatory model of second language reading for this research.

### 2.3 Significance of the Model for the Present Study

In light of the empirical research conducted in second language, Bernhardt's (2005) model is especially significant for the present study in several areas: (a) the issue of language in reading models, (b) the conceptualization of reading comprehension, (c) the characterization of culture, and (d) the assessment in a second language.

The first area relates to the issue of language in reading models. Although the field of second language has progressed tremendously in the past 20 years, research often employed models of reading which had always been based on English first language models (Ehri, 1999; Goodman, 1968, 1988; Gough, 1972; Kintsch, 1998b; LaBerge \& Samuels, 1974; Rumelhart, 1980). Researchers were biased to a degree to surface structure inherent in the English language and not in the second language, which may differ. The models of second language reading, especially in the early French immersion context where students start learning the second language in Kindergarten, cannot be an imitation of English first language research and models. Bernhardt's (2005) compensatory model of second language reading accounts for second language literacy knowledge.

A second significant area relates to the conceptualization of comprehension as consisting of different elements and influences. In particular, the types of inferential comprehension skills demonstrated by readers have often been omitted in other research (Troike, 1978; Willig, 1985). This omission is not surprising, given that most test writers do not always delineate how they have defined comprehension, even though they may have included different types of questions on their tests (Pearson \& Johnson, 1978; Trabasso, 1981). According to Koda (2005), postreading comprehension requiring specific text-explicit information can be answered by locating a word or a phrase. However, comprehension requiring text-implicit information necessitates deeper understanding because it involves inferencing. "Comprehension can become even more demanding when readers are expected to expand on text-meaning" (p. 330). Bernhardt's (2005) model accounts for text-implicit comprehension drawing on textual and cultural inferences. The compensatory model of second language reading examines variables to provide a better understanding of the more implicit and potentially long-term impact that culture has on second language readers' goals and motivations. Bernhardt's (2005) model provides methods to visibly measure or observe students' comprehension as authors' intentions are internalized and interpreted. Bernhardt's (2005) model is significant as it supports the importance of investigating in detail what the authors' intentions and goals are behind the text, as well as the students' reactions and interpretations of that text. Such an investigation can uncover any divergences between what the author is trying to say and what the students are making of the text. This investigation can build on a recent impetus in second language research to incorporate learners' views and perceptions in the text.

Bernhardt's (2005) model is also significant as it moves away from characterizing culture as isolated from the language context in which it occurs. Language learners necessarily become learners of the culture associated with the text because a language cannot be learned without an
understanding of the culture context in which it is used. Cultural learning takes place as an integral part of language learning. Bernhardt's model allows readers to engage with the second language culture that is strengthened by a better understanding of what is going on below the surface of the text. The model takes into account how students engage with the text and become culturally aware. Bernhardt's compensatory model of second language reading suggests that learners become aware that the second language is a means of communication of cultural attitudes as expressed in language. Cultural awareness can be developed through a combination of topic content and knowledge of linguistic conventions in which learners reflect on similarities and contrasts of cultures and on language as a tool for communication. It can be derived from the model that language and culture acquisition are inseparable. To separate language and culture is to imply that a foreign language can be treated in the early years as if it were self-contained and independent of other socio-cultural phenomena. The impact of culture on language learning and use is also important. "If language is seen as social practice, culture becomes the very core of language teaching. Cultural awareness must be viewed both as enabling language proficiency and as being the outcome of reflection on language proficiency" (Kramsch, 1993p. 8).

The significance of Bernhardt's (2005) compensatory model of second language reading lies also in the assessment in the second language. The language assessment with second language populations is a critical factor (Shohamy, 1982, 1984). If readers are assessed in comprehension tasks in their stronger language, comprehension seems to be much more significant than when it is measured within the context of their second language skills. Stronger language skills are almost always first language. Second language skills are often seen as impoverished. However, the French immersion context is different.

In the early French immersion programme, students are taught to read in French as they are starting to speak the language. Students are taught literacy skills in French before receiving
formal literacy instruction in English (Genesee, 2007). French immersion students deal also with informal English literacy learning both at home and in their communities. Second language readers use or attempt to use as many of the same processes as native speakers. Because of decoding problems "the harmony between top-down and bottom-up processing is disturbed" (Wolff, 1987, p. 313). There also seems to be a certain level of language proficiency below which second language readers are unable to use their first language abilities efficiently. The difference here must lie in the fact that proficient first language speakers recognize almost all the vocabulary in a text. They are then able to guess the meaning or any unknown words from context (Johnson, 1981). Low second language level speakers know so little vocabulary that they are not in position to make use of context.

It also seems that for second language readers, background knowledge and content or formal structure play an essential part in reading comprehension. Cultural and content knowledge may be more important than knowledge of form (morphology and syntax) for comprehension. This may be the case for advanced level learners but at lower levels of language learning, knowledge of morphology and syntax might be expected to have a much stronger effect. As Bernhardt (1990) posited earlier "as a reader's linguistic knowledge grows it begins to override knowledge-driven inferencing" (p. 22). Readers begin to rely more on the language and less on what they think the language contains. Therefore, it is important to assess French immersion students employing a range of procedures that account for variables impacting reading comprehension in a second language to be revealed as in Bernhardt's (2005) compensatory model of second language reading.

The present research intends to use Bernhardt's (2005) compensatory model of second language reading theoretical framework as a guide to better understand the role of some
variables identified in the model that come to play when French immersion readers seek to comprehend a text.

A comprehensive examination of the empirical research in reading comprehension and in particular the compensatory model of second language reading proposed by Bernhardt (2005) has led to the identification of five variables. These include phonological awareness, spelling, verbal working memory, vocabulary, morphological awareness and second language cultural knowledge. Although spelling was not included in Bernhardt's model, it is included in the present study to replicate a previous study on reading words (Bournot-Trites \& Denizot, 2005a). Spelling will enable to establish its predictive value of word reading in the context of French immersion. Although Bernhardt's model does not explicitly identify memory as a predictor variable, it does not exclude it either. The model allows testing text comprehension through immediate oral recall which in part relies on memory. In the present study, comprehension of texts with cultural emphasis was assessed using both comprehension questions and immediate oral recall. Verbal working memory was used as an independent variable to verify its predictive value of reading comprehension in the context of French immersion.

The goal of the present study was to shed light on the role of different variables in reading comprehension in second language. The variables, which are the focus of this research, were chosen for three reasons. First, they are prevalent in reading comprehension in reference to the compensatory model of second language reading proposed by Bernhardt (2005). Second, the contribution of some of these variables to reading comprehension remains unexplained in second language. Third, these variables remain a controversial topic in the area of second language reading. This is especially the case concerning French immersion. These variables have not yet been considered in French immersion reading research. An examination and study of these variables will form the basis of the research questions of the present study.

### 2.4 Research Questions

The purpose of the present study was to examine the predictors of word reading and reading comprehension of French immersion students. A complete review of the theory and empirical research was undertaken. By examining word reading, reading comprehension, phonological awareness, spelling, verbal working memory, morphological awareness, vocabulary and second language cultural knowledge skills of students in the early French immersion programme, four questions in the area of early reading development guided this programme of study. Following this literature review, the four research questions can be formulated more precisely.

1. What is the best predictor of word reading among phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness in Grade 3 French immersion students?
2. What is the best predictor of reading comprehension among phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness in Grade 3 French immersion students?
3. What is the relative role of second language cultural knowledge compared to phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness in Grade 3 French immersion students' reading comprehension?
4. What do French immersion students perceive as different in the culturally less and more familiar text that affected their reading comprehension and which cultural context do they prefer and why?

## CHAPTER 3: METHODOLOGY

The study was conducted with a group of Grade 3 French immersion students in two elementary public schools in the same school district in British Columbia in order to address the four research questions.

### 3.1 Research Setting

### 3.1.1 The French Immersion Programme

In British Columbia, French immersion programmes fall under two categories: early and late immersion. In early immersion students enrol in Kindergarten when they are 5 years old. In late immersion students begin in Grade 6 or 7 when they are 11 to 12 years old. In both cases, the language of instruction is exclusively in French, although the mother tongue of the students may be English or another language.

The research for this study was conducted in two schools within the context of the early French immersion programme in British Columbia. In the two schools, French immersion curriculum is instructed $100 \%$ in French from Kindergarten to the end of Grade 3. From Grade 4 to 7, instruction is $50 \%$ French. At the high school level, from Grade 8 to 10 , instruction is $40 \%$ French. This percentage of French instruction declines to $25 \%$ in Grade 11 and to $12.5 \%$ in Grade 12.

### 3.1.2 Research Site

The research took place in two elementary public schools (six divisions) in the greater Vancouver area in the province of British Columbia. The two schools were in the same geographic area and were from the same socioeconomic status range. Information obtained verbally from the principals of the two schools and data retrieved from census tract profile for the area (Statistics Canada, 2006b) confirmed that the participants were of similar but medium
socioeconomic status compared to the national and provincial median income of all census families (Statistics Canada, 2006a). Socioeconomic status was determined in terms of median income of all census families and education attainment (university certificate, diploma or degree obtained).

In the past three years, the examiner has also helped supervise the testing of reading of French immersion students from Kindergarten to Grade 2 in one school and from Grade 1 to Grade 3 in the other school. The choice of the two research sites was motivated by the fact that the principals and some of the teachers in the two French immersion schools had already expressed interest in this research. Relationships and experiences with staff, students and the daily workings of the two schools have added and enriched the present research in Grade 3 French immersion.

### 3.1.3 Participants

The study was undertaken with 72 Grade 3 students of the early French immersion programme. The number of consent forms initially sent to parents was 84 . Out of the 84 potential participants, 10 parents did not consent to their child's participation. The response rate was 88.09\% (74/84). Among the 10 parents that did not consent to their child's participation, three parents were working at the University and were against testing as a principle. The rest of the parents were equally first and second language speakers. There was no participant selection bias. Two students became sick after being tested on two tasks (group testing). The attrition rate was $2.7 \%(2 / 74)$ which is below the $20 \%$ acceptable rate (Goodrich \& St-Pierre, 1979). Only 72 participants remained in the study and were tested.

Of the 72 participants in Grade 3, 41 were girls and 31 boys. The mean chronological age of the sample was 107.68 months ( 8 years and 11 months) with a standard deviation of 11.38
months. Participants came from two schools and six divisions in the same School District in the greater Vancouver area. Table 1 summarizes the number of participants by gender.

## Table 1

Grade, Number of Schools, Divisions, Participants, Gender, and Average Age

| Grade | Schools | Divisions | Participants | Girls | Boys | Average <br> Age (months) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 3 | 2 | 6 |  | 72 | 41 | 31 |

### 3.1.4 Design

All participants were tested individually in one session in the spring of their Grade 3 year. They were 45 English as first language participants. The 27 participants with English as a second language in this study came from divergent linguistic backgrounds. All participants spoke English although some participants had a first language other than English. Overall, the second language of the participants in this study represented 13 native languages. The participants spoke a variety of first languages. They were grouped into language families as follows: Chinese group (Cantonese, Mandarin, Thai), Slavic group (Hungarian, Russian, Serbian), Arabic group (Arabic, Farsi), German group (German), Japanese group (Japanese, Korean), and Romance group (Portuguese, Spanish). Another group was composed of English native speakers (English). Mandarin, Cantonese and Russian were the predominant first languages among English as second language participants. The participants in this research constituted a representative sample in terms of gender and linguistic background of a growing proportion of students presently enrolled in early French immersion schools in British Columbia. Table 2 below summarizes the number of participants by language group in order of descending frequencies.

Table 2

Frequency and Percentage of First Language Spoken

| Language Group | N | \% |
| :--- | :---: | :---: |
| English | 45 | 62.5 |
| Chinese | 12 | 16.7 |
| Slavic | 6 | 8.4 |
| Arabic | 3 | 4.2 |
| German | 2 | 2.8 |
| Japanese | 2 | 2.8 |
| Romance | 2 | 2.8 |

Note: Language groups are represented as follows: English (English), Chinese (Cantonese, Mandarin, Thai), Slavic (Hungarian, Russian, Serbian), Arabic (Arabic, Farsi), German (German), Japanese (Japanese, Korean), and Romance (Portuguese, Spanish).

### 3.2 Ethical Consideration

The present study strictly followed the University of British Columbia Application for Behavioural Ethical Review research guidelines precisely in order to ensure the research would be conducted in an ethically responsible way. An application to conduct research was approved by the University of British Columbia Behavioural Research Ethics Board as well as by individual district committees in order to gain access by the researcher (see Appendix A). The researcher also sought approval to conduct research in each school district through an application made to the relevant school district. Letters and an information package were sent through e-mail to each school administrator and the targeted grade level French immersion teacher whose class was involved in the testing. The information package included the following: (a) The Development of Reading Skills in French Immersion document with the purpose, objective, rationale, questions and hypotheses, procedure, tasks of the study and how data were to be
collected and recorded, (b) a List of Experimental Tasks and Standardized Tests, and (c) an Informed Consent Form detailing the investigator's name, the purpose and procedures of the study, confidentiality and contact information. Letters to parents of each participant was sent to request consent for their child to undertake the test. The informed consent procedures for all participants ensured questions and information concerning the study was shared. Participants were also asked for assent before testing was administered (see Appendix B).

The purpose and procedures of this research was clearly stated to all prospective participants through their parents. This was done to protect participants as participation in this research was presented as strictly voluntary. No pressure of any kind was placed on prospective participants to participate. Participants were allowed to terminate their involvement with the study at any time without suffering any penalty.

At all times data collected in this research was treated as confidential. All participants were assigned numbers by the researcher to protect their anonymity and ensure confidentiality. Access to raw data was limited to the researcher only. The one exception to this allowed participants and parents access to their own data upon request.

The importance that the relationship established between researchers and informants be built on trust and openness was addressed prior to undertaking the research. It was made very clear to teachers, parents and participants that this research was not to be used to test or evaluate the ability to teach students. The goal of the research was also not an attempt to discover deficiencies in individual teaching methods or the reading comprehension of tested participants. The goal was to provide a detailed report of what contributes to reading comprehension of French immersion Grade 3 students. In no way did the research result in the evaluation of any individual or student performance. What was attempted was the production of a useful account, not only for researchers but also for teachers and students, of the variables that contribute to
reading comprehension of French immersion Grade 3 students and how these fit in with the larger context in which they emerge. The researcher did not anticipate any perceived risks to participants and addressed, explained and dealt with ethical dilemmas and questions in the research project prior to beginning the present research.

### 3.3 Measures

Several measures of language skills shown as contributing to reading development in the research literature were used.

In the present study, three categories of measures corresponding to Bernhardt's (2005) three dimensional model were used: (a) first language literacy knowledge, (b) second language knowledge, and (c) hypothetical variables (see section 3.3.10 Figure 2). As discussed in section 2.1.3.1, measuring the participants' literacy knowledge only in their first language would not take into account what the participants learned in schools in their second language, French (Bournot-Trites et al., In preparation). Some of the first language knowledge is transferred to French language literacy knowledge (e.g., phonological awareness and morphological awareness). For the purpose of the present research, second or additional (French) language knowledge was measured instead of first language knowledge.

Second language literacy knowledge measures comprise phonological awareness and spelling. Second language knowledge measures include morphological awareness, vocabulary knowledge and verbal working memory. The measures corresponding to the hypothetical variables of Bernhardt's model are second language cultural knowledge and students' engagement towards texts read.

Literacy was measured through word reading, reading comprehension of isolated sentences and reading comprehension of narrative texts with cultural emphasis. Post-measure
interviews were conducted to determine which narrative text participants perceived as being easier to read. Participants' engagement in the texts read was also evaluated.

Phonological awareness was assessed using syllabic tasks (French initial and final syllable deletion) and a phonemic task (French middle phoneme deletion). Other measures included spelling, verbal working memory (Digit Span - Digits Forward and Digits Backward), vocabulary (ÉVIP), morphological awareness, second language cultural knowledge, word reading and reading comprehension. Reading comprehension was assessed using isolated sentences with pictorial support and narrative texts with cultural emphasis. Interviews were also conducted to determine what participants perceived as different cultural elements in the cultural texts that affected their reading comprehension and how they engaged towards the passages read. Sections 3.3.1 to 3.3 .9 will present the various measures and the interview.

### 3.3.1 Word Reading

French word reading was assessed with the French Immersion Assessment Test (FIAT). The child was administered the Word Identification Subtest of the FIAT - Lecture de mots (Wormeli \& Ardanaz, 1987). The participant was asked to read isolated French words from simple to more complex (see Appendix C), including both single and multiple morpheme words (e.g., vite, demandait, avantageux).

Each item was scored 1 , or 0 as follows: (a) 1 point if the word was read correctly, and (b) 0 points if the word was read incorrectly. The basal level was reached after six correct consecutive responses. The task was discontinued after six consecutive errors. The raw score was the number of correct items plus the number of items below the basal level. The maximum score on this task was 86 points. The raw score was used for the analysis.

Internal consistency reliabilities were calculated using Hoyt's ANOVA in accordance with the Canada FIAT manual (Wormeli \& Ardanaz, 1987). Twenty of the twenty-six
coefficients have reliability values of .80 or better and are deemed adequate for a screening achievement test (Wormeli \& Ardanaz, 1987, p. 23). For the FIAT Word identification Subtest (Subtest 3) in Grade 3, the reliability coefficient was 96 . For reliability purposes, the internalconsistency reliability for the sample of the present study was calculated using Cronbach's alpha. This test had a good level of reliability (Cronbach's $\alpha=.96$ ). Standard errors of measurement were obtained and indicated the expected band of error surrounding a raw score. The actual value for the FIAT Word Identification Subtest in Grade 3 is 2.69. The standard error of measurement also indicated the chance at about two-third that the participant obtained a scaled score within 2.69 scaled-score points of his/her true score. That is the average score a participant would obtain if he/she was tested a large number of times and if the effects of practice, fatigue and others, are ruled out.

When administered by competent personnel the Canada FIAT may be considered as a valid measure of the achievement of Early French immersion students. The Canada FIAT meets the following criteria. It was normed on pupils who were enrolled in early French immersion classes across Canada. For content validity, reading and spelling test tasks and materials were selected and/or designed from basal readers that where then widely used in Language Arts Instruction Early French immersion classrooms across Canada. Empirical validity evidence was investigated during a 1987 validation study. This resulted in the conclusion that the Canada FIAT satisfactorily identifies students who are eligible for referral to remedial services. Once the norms had been established, the Grade 2 and Grade 5 subtests were administered to students from three different school districts in British Columbia. The sample included students who required remedial learning assistance and students who did not. The mean and standard deviation for the remedial students were 7.6 and 3.3, and for the non-remedial students 9.3 and 4.1 respectively, in reference to the norms in Grade 2.

### 3.3.2 Reading Comprehension

French reading comprehension was assessed in two ways: (a) reading comprehension of isolated sentences (Khomsi, 1999), and (b) reading comprehension of two narrative texts with cultural emphasis through a free recall measure, and literal and inferential comprehension questions. Each will be further described in the following sections 3.3.2.1 and 3.3.2.2.

### 3.3.2.1 Reading Comprehension of Isolated Sentences

French reading comprehension of isolated sentences was assessed using l'Épreuve d'évaluation de la compétence en lecture - Révisée (LMC-R), Compréhension en lecture (Khomsi, 1999). The participant was administered the reading comprehension subtest of the Compréhension immédiate (CI). The Compréhension immédiate (CI) subtest consisted of 21 sentences for CE2 (Cours Élémentaire Deuxième Année) which "corresponds to the third primary grade in France for children of an average age of 8 years and 4 months" (Khomsi, 1999, p. 1, footnote 1 , Translation by author).

The rationale for choosing the Compréhension Immédiate ( $C I$ ) subtest rather than the Compréhension Globale (CG) subtest is that the latter is the longer version of the comprehension subtest given to Grade 4 and 5 students in France. The rationale for choosing the CÉ2 level (Cours Élémentaire Deuxième Année) rather than the next level, CM1 (Cours Moyen Première Année) for students of an average age of 9 years and 5 months was twofold. First, although the participants in this study had an average age of 8 years and 11 months, the CM1 level is for older individuals with an average year of 9 years and 5 months. Second, participants are in the French immersion programme where French instruction is considered as French as a second language. Therefore, the CÉ 2 level best corresponded to the participants in this study.

This task was evaluated through an approach of comprehension strategies: imagery (imagée) or inferential (inférentielle) content. This task is different than most common tasks of
comprehension that involve remembering or questions after reading and which are dependent on the capacity to memorize, making the interpretation difficult (Khomsi, 1990). This subtest was subdivided in two different types of items presented randomly on Picture Plates with four pictures for each item: (a) 16 imagery (imagée) content statements (Ig), and (b) 5 inferential (inférentielle) content statements (If).

For the 16 imagery content statements (Ig), a representation corresponding to a mental image can be constructed from the reading or the hearing of the statement. For example, in the sentence 'Je mange les cerises que maman cueille' (I eat the cherries that mom is picking) the reader can construct an imagery representation. The two actions are simultaneous and the participant can identify the picture where the two actions are represented simultaneously (Khomsi, 1999). In this task, the participant read aloud or read silently the sentence written. One picture was chosen among four that best represented the meaning of the sentence. The participant either pointed to the correct picture or gave the number of the picture $(1,2,3$, or 4$)$ that represented the sentence (see Appendix D).

The 5 inferential content statements ( $I f$ ) implied that the simple construction of an imagery representation was impossible or was not sufficient to make a choice. The participant needed to infer to choose the correct picture. For example, in the sentence 'Le chat dont j'ai tiré la queue m'a griffe' (The cat whose tail Ipulled scratched me), the reader needed to infer that it was the final stage (follow up and consequence) of two actions included in the sentence that was the correct answer. In this task, the participant read aloud or silently the sentence written and chose one picture among four that best represented the meaning of the sentence. The participant either pointed to the correct picture or gave the number of the picture $(1,2,3$, or 4$)$ that represented the sentence. Two practice items, corresponding to each type of content statements,

Ig or $I f$, were given prior to administering the test, and the examiner gave instruction and corrective feedback at this time.

Each item was scored 1, or 0 as follows: (a) 1 point for choosing the correct picture corresponding to the meaning of the sentence, and (b) 0 points for choosing an incorrect picture corresponding to the meaning of the sentence. The imagery (imagée) content statement (Ig) category accounted for a total of 16 points and the inferential (inférentielle) content statement (If) category accounted for a total of 5 points. The maximum score on this task was 21 points. The raw score was used for the analysis.

The reading comprehension subtest - Compréhension en lecture - Compréhension immédiate subtest of the Épreuve d'évaluation de la compétence en lecture (Khomsi, 1999) was normed in 1998 in France with 614 French natives from ages 7 to 12 years in Grades 2 to 7. Specifically, 285 students of the Cours Élémentaire (CÉ) - equivalent to Grade 2 and 3 (CÉ1 and CÉ2), 241 students of the Cours Moyen (CM) equivalent to Grades 4 and 5 (CM1 and CM2), 88 students of 5ième année equivalent to Grade 7, and 74 students in remedial classes. Means and standard deviations were calculated for each part of the subtest, imagery (imagée) vs. inferential (inférentielle) at each grade level. The means were fairly linear and standard deviations important but relatively stable, varying between 2.1 and 2.7. No reliability coefficients were provided.
"LMC-R is a clinical tool and the means and standard deviations are only given on an information basis as the author's first intention is to have details about students in the bottom of the distribution to better understand their reading comprehension difficulties. Percentiles enabled to construct graphic profiles." (Personal communication between Denizot and Khomsi, February 19, 2007, Translation by author)

For reliability purposes, the internal-consistency reliability for the sample of the present study was calculated using Cronbach's alpha. This test had an acceptable level of reliability (Cronbach's $\alpha=.69$ ), though it adds some noise to the power of the hypothesis test results.

Content validity was supported by selection of test tasks and materials designed from basal readers that were used widely in French Language Arts Instruction classrooms in France. Construct validity was supported by gradual increases over age in percentage of participants who responded correctly to an item. Concurrent validity was established against the LMC-R and the ÉCS (Évaluation des Compétences Scolaires) test (Khomsi, 1997, 1998). Coefficient of concurrences of the LMC-R/ÉCS-II scores for immediate comprehension (Compréhension Immédiate $-C 1$ ) was $.415(p<.01)$ in Grade $2(C E ́ 1)$ and of the LMC-R/ÉCS-III scores for immediate comprehension (C) were $.592(p<.0001)$ in Grade 3 (CÉ2), the highest, which are moderate to large correlations.

Empirical validity evidence was investigated during the 1998 validation study. The immediate comprehension $(C I)$ score, the short version of the comprehension subtest given to Grades 2 and 3, rises dramatically between Grade 2 (CÉ1) and Grade 3 (CÉ2). This trend moderates in higher grades.
"The immediate comprehension part of the reading comprehension subtest corresponds to its finality: to evaluate reading comprehension for imagery types statements, the most simple for the children of younger ages. It enables to identify, in Grades 2 and 3 (CÉ1 and CÉ2), important individual differences, and the analysis of incorrect answers should enable ... to establish the difficulties related to reading comprehension." (Khomsi, 1999, p. 18, Translation by author)

The immediate comprehension subtest satisfactorily identifies students who are eligible for referral to remedial services. The comprehension subtest has been used in a bilingual context by Demont (2001) in a study of 43 Grade 1 students (20 Francophone and 21 French-German bilinguals). Demont's (2001) study was designed to validate the effects of second language learning on children's linguistic awareness.

### 3.3.2 2 Reading Comprehension of Narrative Texts with Cultural Emphasis

The reading comprehension of narrative texts with cultural emphasis task was designed to examine how much the participants recalled from reading two narrative texts. Participants had also to answer comprehension questions based on the two narrative texts, which are described following (see Appendix E).

### 3.3.2.2.1 Passages

The texts were script-based contrived narrative passages. A narrative was embedded in a communicative interchange between the writer and the reader.
'Narratives are expressions of event-based experiences that (a) are either stored in memory or cognitively constructed, (b) are selected by the teller/writer to transmit to the audience/reader, and (c) are organized in knowledge structures that can be anticipated by the audience." (Barr, Kamil, Mosenthal, \& Pearson, 1991, p. 174)

The narrative texts were written specifically for this study in an attempt to provide French immersion students with a reading passage on a cultural topic. The topic of 'lunch recess in elementary school' was chosen to avoid any gender effect between boy and girl participants. One passage pertained to a more familiar Canadian scenario of lunch recess in a school. The other passage pertained to a less familiar scenario of lunch recess in a school in France.

The more familiar passage, 'Le lunch' [The lunch], was based on a scenario considered to be routine and very familiar to participants. All participants were Grade 3 students in British Columbia who ate lunch at school and engaged in lunch time activities. The context was designed to be more familiar as it was based on the participant's daily experiences and cultural knowledge.

The less familiar passage, 'Le déjeuner' [The lunch], was based on a scenario considered to be routine but less familiar to participants as the setting was situated in a French elementary school in France. This country was chosen after determining that the participants typically knew very little about France and in particular the culture of the country in regards to lunch recess at
an elementary school. This aspect was controlled by ensuring that participants indicated on a preliminary informal background check prior to the testing that they had no prior second language cultural knowledge of lunch recess at school in France.

The task was developed by the researcher to make it more consistent with an approach of to reading where a given task should be as authentic as possible by being relevant to life. In this approach, reading is seen as a communicative activity. The reader interacts not only with a specific purpose of reading but also with 'authentic texts' as part of a specific social and cultural situation. The stories were constructed around the most frequently occurring actions and type of food and order of occurrence to reflect an 'authentic situation' as closely as possible. For purposes of testing second language cultural knowledge through reading and its influence on reading comprehension, culture had to be 'stereotyped' in order to differentiate between less and more familiar culture.

In keeping with the objective that the stories represented an everyday scenario, the content of the two stories was constructed using information found on websites. The actions that occurred within the more and less familiar stories were determined by gathering information on elementary schools in British Columbia and France. Common aspects (time, food, activities) of these cultures to which Grade 3 students were exposed during lunch recess were correlated. A pool of experts was consulted and asked to review each story for comment regarding cultural relevance. This pool included three primary-school French immersion teachers and two primaryschool teachers in France. Four Ministry coordinators for French as a second language in British Columbia and two researchers in the University of British Columbia, Faculty of Education were also consulted and asked for comment on their cultural typicality. The interrater reliability was high (Cronbach's alpha of .95), indicating that the judges agreed to a large extent in their
decisions. The judges also made clear choices whether a text referred to either culture. This result showed that it was possible to grade the texts with respect to their cultural reference.

The common aspects (time, food, activities) of these cultures served as the contexts within which three categories of words were situated. A detailed explanation of the categories of the cultural words, which served as the basis of the second language cultural knowledge task, is provided in section 3.3.8. In terms of frequency, the words were found on the list of words that should be common to Grade 3 readers, or were among the most frequent words in Baudot's (1992) Fréquences d'utilisation des mots en français écrit contemporain, edited in Montreal, Quebec, Canada. Both the more and less familiar stories conformed to a temporally ordered set of activities pertinent to the scenario (see Appendix L). These activities referred to the nature of the description of actions portrayed in the stories, where some actions typically precede others at lunch recess in a school environment (i.e., having lunch, cleaning, going out to play, etc.). Within each scenario there were particular roles and objects associated with the actions involved in the story. The culturally more familiar story was centered around a script purported to be stored in participants' long term-memory (Graesser, Singer, \& Trabasso, 1994; Schank \& Abelson, 1977).

The two stories were written to correspond to the participants' current grade level. The passages conformed to the narrative schema following key aspects of text organization and discourse features of narrative text: where, who, when, what, outcome. Narrative texts were chosen over expository texts. Narrative texts pose less challenge than expository texts because they are less varied and complex (Williams, Hall, Lauer, Stafford, DeSisto, \& deCani, 2005). The final version of each story was in general of similar sentence and text length and structurally comparable. Each story consisted of four paragraphs. Each of the two passages was subjected to a semantic propositional analysis (see Appendix F). According to the results of theses analyses,
each of the passages contained the same number of main, supporting and detailed propositions and clauses headed by 'que' [relative clause] and connecting words. The connecting words varied depending on the differences in the nature of actions and/or the greater degree of personal interactions involved in the scenario. Table 3 provides a comparative analysis of the various text features of each story.

Table 3
Comparison of Cultural Passages

|  | Less Familiar | More Familiar |
| :--- | ---: | ---: |
| Number of Words | 140 | 135 |
| Average Sentence Length | 13.30 | 12.09 |
| Idea of Unit Analysis | 73 | 73 |
| Main Ideas (weight x3) | 27 | 27 |
| Supporting Ideas (weight x2) | 22 | 22 |
| Details (weight x1) | 24 | 24 |
| Connecting Words | 14 | 14 |
| Que | 1 | 1 |
| Pour | 2 | 2 |
| Et | 5 | 1 |
| Sans | 1 | 1 |
| Avec | 1 | 1 |
| Ensuite | 1 | 1 |
| Pendant que | 1 | 1 |
| Entre | 0 | 1 |
| Quand | 0 | 0 |
| Aussi | 0 | 1 |
| Avant de | 1 | 0 |
|  | 1 | 1 |

The reading comprehension of narrative texts with cultural emphasis task was measured on the basis of two layers of meaning crucial to understanding which lead the reader to the whole meaning of the text: explicit meaning of the text (who? what? where?) and implicit meaning of the text (why? how?). The reading comprehension of narrative texts with cultural emphasis task had two sub-parts: (a) a free recall measure, and (b) answering literal and inferential comprehension questions. Participants were asked to read one narrative passage first. Participants were then asked to recall verbally as much as they could from the passage. They also answered 5 literal questions on the passage. Each participant then read the second passage following the same steps. The order of the texts was counterbalanced (half of the student read the first narrative passage followed by the second one, and the other half read the second narrative passage first followed by the first one). Participants were then asked to compare the passages by answering 3 inferential questions.

### 3.3.2.2.2 Free Recall Measure

In this sub-task participants were asked, after reading each story, to recall verbally as much as they could of the passage they had just read without referring back to it. Participants could recall in French or in English, although French was encouraged. The maximum score for this sub-task was 87 points for each story. The raw score was used for the analysis.

Both quantities and qualities (Barnett, 1986; Carrell, 1983c, 1984a, 1984b, 1985, 1987; Lee, 1986a, 1986b; Lee \& Riley, 1990; Raymond, 1993) of the participants' recalls of the texts was examined because they have traditionally been used as measures of reading comprehension in both first language and second language literature (e.g., Carrell, 1987; Floyd \& Carrell, 1987; Johnson, 1981; McNamara, Kintsch, Songer, \& Kintsch, 1996; Steffensen et al., 1979).

Each passage was first divided into idea units in preparation for scoring. A three-tiered hierarchy of idea units was used, including main, supporting and detailed ideas. The recall
protocol scoring procedures (Johnson, 1970; Meyer, 1975a, 1975b) separate the recall ideas into individual items to arrive at total scores. The method of determining quantities and qualities was adapted from Pritchard (1990). An idea unit in the retelling is defined as "a word, a verb or phrase with a stated or understood subject that, together with its modifiers, formed a single idea unit" (Pritchard, 1990, p. 278). The more common definition of idea units, using "functional boundaries based on pausal acceptability" (Johnson, 1970, p. 13), is based on surface structure conventions which ignore the semantic content of the text. This definition was less appropriate for the present study.

An idea unit was coded as 'main' if it represented the gist of the text preserving its semantic content (not necessarily the syntactic form) even though it was not a word-for-word reiteration. An idea unit was coded as 'supporting' if it represented an important element of the text preserving its semantic content (not necessarily the syntactic form). An idea unit was coded 'detailed' if it represented a less important element of the text preserving its semantic content (not necessarily the syntactic form) (see Appendix F for the semantic propositional breakdown of the two stories). A word count was made. The idea units correctly recalled were judged to be the product of properly formed schemata in the subsequent analysis. Idea units were identified, verified, rated and scored by the researcher and ten independent judges prior to the study. All judges were native speakers of the French language. Five of the judges were French-Canadian and the other five judges were native to France. A main idea was credited with three points, a supporting idea with two points and a detailed idea with one point. The maximum score for the idea units was 73 points for each story.

In order to make sure that the total score was meaningful and appropriate, internal consistency estimates were needed to supplement interrater agreement indices. Once all recall data were recorded, the reliability for the coding was checked. To establish reliability of the
judgment of numbers of idea units, data from a randomly selected sample ( $20 \%$ of the total sample population) was rated and coded by two judges from each culture - France and Canada using the same coding scheme. For inter-rater reliability, the researcher, who is also a French immersion teacher (native of France), and another French immersion teacher (native of Quebec), who was trained to score participants' recall protocols, scored 20 percent of all protocols. The teacher scored the protocols using a template that had a list of idea units and connecting words. The scores were tested against the score given by the researcher for inter-rater reliability. Interjudge consensus was obtained between the two judges from each culture in their ratings of the idea units. Reliability turned out to be .90 ( $p<.01$ ). For intra-rater reliability, the researcher scored again 20 percent of all the recall protocols after the completion of the first scoring. The two scores were compared against each other using correlation analysis. Reliability turned out to be .97 ( $p<.01$ ).

Connecting words reflecting the semantic content of a complex proposition in a text (i.e., the predicate-argument schema) were identified adapting methodologies used in Kintsch (1998b) for native language reading and Barry and Lazarte (1998) for second language reading studies. Propositional analyses such as these represent the semantic content of the text, rather than the surface form of rhetorical organization of the passages. Such a methodology for examining comprehension (in comparison of the sole use of surface structure or multiple choice instruments) has received support stemming from the validity of propositions (Kintsch, 1998b). Each connecting word was worth one point for a total of 14 points for each story.

### 3.3.2.2.3 Comprehension Questions Measure

After reading a passage, each participant was asked to answer orally five literal contentbased comprehension questions following the analysis of the narrative scheme (where, who, when, what, outcome). Once the participant had completed the free recall and answered the
literal comprehension questions for each passage, the participant was asked to answer three inferential content-based questions based on the comparison of the two passages (why, how). The comprehension questions were constructed and included for each passage according to Johnston's (1984) adaptation of Pearson and Johnson's (1978) question-type taxonomy to assess reading comprehension.

A question is considered literal or textually explicit when the question and answer are paraphrased from or found in a single sentence in the text. A question is considered inferential or textually implicit when the question and answer are not paraphrased from or found in a single sentence but are inferred in the passage. Asking two other judges to classify the questions independently corroborated the assignment of the questions, to each of the two categories, literal and inferential. For each text, the score for the literal questions was seven points and for the inferential questions five points, for a total score of 12 points (see Appendix E for a list of the questions). The raw score was used for the analysis.

### 3.3.3 Phonological Awareness

Participants were administered two measures of phonological processing. The measures included syllabic and phonemic tasks adapted from Gaux (1996) by Bournot-Trites and Denizot (2005a) (see Appendix G). Three practice items were administered prior to administrating the test and the examiner gave instruction and corrective feedback at this time.

The syllabic tasks comprised French initial and final syllable deletion subtasks.
In the French initial syllable deletion task, the examiner said a word to the participant (e.g., 'marcher') and asked the participant to say the word without the first part or first syllable (i.e., 'mar'). The participant answered 'cher'.

In the French final syllable deletion task, the examiner said a word to the participant (e.g., 'poupée') and asked the participant to say the word without the last part or last syllable (i.e., 'pée'). The participant answered 'pou'.

The phonemic task consisted of a French middle phoneme deletion subtask.
In the French middle phoneme deletion task, the examiner said a word to the participant (e.g., 'hibou') and asked the participant to say the word without the middle part or middle sound (i.e., ' $b$ '). The participant answered 'hiou'.

Each item was scored 1, or 0 as follows: (a) 1 point for a correct answer, and (b) 0 points for an incorrect answer. The task was discontinued after five consecutive errors. The maximum score on this task was 20 points. The raw score was used for the analysis.

For reliability purposes, the internal-consistency reliability for the sample of the present study was calculated using Cronbach's alpha. This test had a satisfactory level of reliability (Cronbach's $\alpha=.82$ ).

### 3.3.4 Spelling

Spelling was assessed with the French Immersion Achievement Test (FLAT) Spelling Subtest (Wormeli \& Ardanaz, 1987). In this task, the examiner read to the participant each word alone, then presented the word within a sentence and finally alone again. The participant was asked to write the word as accurately as possible with no time constraint. As presented in Appendix H, there were 55 test items increasing in difficulty, for example 'lui' [him] to 'arrondissements' [city-quarter].

Each item was scored 1, or 0 as follows: (a) 1 point for a correct answer, and (b) 0 points for an incorrect answer. The basal level was reached after six correct consecutive responses. The task was discontinued after six consecutive errors. The raw score was the number of correct
items plus the number of items below the basal level. The maximum score on this task was 55 points. The raw score was used for the analysis.

The FLAT Spelling Subtest (Subtest 1) was found to have a reliability coefficient of .84 in Grade 3. For reliability purposes, the internal-consistency reliability for the sample of the present study was calculated using Cronbach's alpha. This test had a satisfactory level of reliability (Cronbach's $\alpha=.83$ ). The standard error of measurement indicating the expected band of error surrounding a raw score was 1.99 for the FIAT Spelling Subtest in Grade 3. The standard error of measurement also indicated the chance at about two-third that the participant obtained a scaled score within 1.99 scaled-score points of his/her true score. That is the average score a participant would obtain if he/she was tested a large number of times, and if the effects of practice, fatigue and others, are ruled out. The validity of the FIAT was discussed in section 3.3.1.

### 3.3.5 Verbal Working Memory

Verbal working memory was measured with the Digit Span Test which is part of the Supplementary Verbal Test of the Wechsler Intelligence Scale for Children (WISC-R) (Wechsler, 1974). There were two parts to the Digit Span Test - Digits Forward and Digits Backward (see Appendix I). The tasks were administered separately, following one after the other.

In the Digits Forward subtask, the participant was asked to listen and repeat correctly in French exactly the numbers given. For example, if the numbers 3-8-6 were given, the child repeated the numbers in the same order 3-8-6. The digits were given at the rate of one per second. Each task had seven items and two trials. All seven items of each trial were tested. Both trials (Trial 1 and Trial 2) were administered, even if the participant passed Trial 1. The task was discontinued after failure on both trials of any item. One practice item was given prior to administrating the test and the examiner gave instruction and corrective feedback at this time.

In the Digits Backward subtask, the participant was asked to listen and repeat in French the numbers backwards. For example, if the numbers 7-2-9-6 were given, the participant repeated the numbers in the reverse order 6-9-2-7. The digits were given at the rate of one per second. Each task had seven items and two trials. All seven items of each trial were tested. Both trials (Trial 1 and Trial 2) were administered, even if the participant passed Trial 1. The task was discontinued after failure on both trials of any item. One practice item was given prior to administrating the test and the examiner gave instruction and corrective feedback at this time.

Each item was scored 2, 1 or 0, for both subtasks, Digits Forward and Digits Backward. The following scoring was used: (a) 2 points for a correct answer on both trials, (b) 1 point for a correct answer on only one trial, and (c) 0 points for an incorrect answer on both trials. The maximum score on Digits Forward was 14 points and on Digits Backward was 14 points. The total score for the Digit Span Test was the sum of scores on Digits Forward and Digits Backward. The maximum score on this task was 28 points. The raw score was used for the analysis.

The split-half procedure, which provides a measure of internal consistency, was not appropriate for Digit Span, because it was given as two separate subtests. The reliability coefficients were test-retest or stability coefficients. They were obtained for six age groups of about 50 children each tested twice (one-month interval) and corrected for the variability of the appropriate normative age group. On average, the reliability coefficient was .78 , which is satisfactory. For the interested age group for this study, $8^{1 / 2}$ and $9^{1 / 2}$ years old, stability coefficients were not available. "The best estimate of reliability coefficient of the Digit Span at an age level were retesting was not done is the value obtained at the adjacent age level, e.g., the .84 obtained for Digit Span at age $7^{1 / 2}$ is the best guess for age $8^{1 / 2 "}$ (Wechsler, 1974, p. 28, Note b). For reliability purposes, the internal-consistency reliability for the sample of the present study
was calculated using Cronbach's alpha. This test had a satisfactory level of reliability (Cronbach's $\alpha=.81$ ).

The standard error of measurement provides an indication of confidence in making judgments about a child's true ability on the Digit Span. It is a function of the reliability coefficient and the variability of test scores indicates the band of errors surrounding a test score. The standard error of measurement for the Digit Span was 1.44 on average. The standard error of measurement also indicated the chance at about two-third that the participant obtained a scaled score within 1.44 scaled-score points of his/her true score. That is the average score a participant would obtain if he/she was tested a large number of times, and if the effects of practice, fatigue and others, are ruled out. The mean and standard deviation were 10.1 and 3.1 respectively, in reference to the norms given for $6^{1 / 2}-7^{1 / 2}$ years old.

### 3.3.6 Vocabulary

Vocabulary was measured with the Échelle Vocabulaire en Images Peabody (ÉVIP) ${ }^{8}$ (Dunn et al., 1993b). This test is a measure of receptive vocabulary. In this task, the participant was asked to choose one picture among four that best represented the meaning of the word given by the examiner. The participant either pointed to the correct picture or gave the number of the picture ( $1,2,3$, or 4 ) that represented the word. Form $A$ and "PicturePlate D and E for participants 8 years and older" (Dunn, Thériault-Whalen, \& Dunn, 1993a, pp. 28-29) were used. Five practice items were given prior to administrating the test and the examiner gave instruction and corrective feedback at this time (see Appendix J).

Each item was scored 1 , or 0 as follows: (a) 1 point for a correct answer, and (b) 0 points for an incorrect answer. A raw score was determined by subtracting the individual's total number of errors over his or her critical range from the ceiling item. This score was based on the

[^6]assumption that all items below the basal set (the lowest set of items administered containing one or no errors) were correct, and all items above the ceiling set were incorrect. The ceiling set was established after the highest set of items administered contained eight or more errors. The ceiling item was the last item in the ceiling set. The maximum score on this task was 170 points.

The raw score was used for the analysis.
ÉVIP, the French version of the PPVT, was normed in Canada with 2038 young people whose mother tongue was French. Split-half procedures were applied to the scores of all participants in the standardization sample.
"The resulting coefficient of internal consistency (Spearman-Brown) ranged from .68 to .88 (median .81 ) for children below age 19 for Form A and ranged from .66 to .85 (median .80) for Form B. In particular the coefficient of internal consistency was of .76 (Form A) and of . 79 (Form B) for children between 8 years and 8 years and 11 months old and of .83 (Form A) and of .81 (Form B) for children between 9 years and 9 years and 11 months old." (Dunn et al., 1993a, p. 40)

Those correlations indicated acceptable to high levels of internal consistency among the performance on alternate items (Wiig, 1984). Test-retest reliability was established for a subsample of 1806 for all age groups tested with a time interval of seven days. The resulting raw score coefficients ranged from .55 to .78 (median .72). Although some coefficients are a bit low, the median is acceptable. The raw score coefficient was .74 for participants between 8 years and 8 years and 11 months old and .77 for participants between 9 years and 9 years and 11 months old. For reliability purposes, the internal-consistency reliability for the sample of the present study was calculated using Cronbach's alpha. This test had a satisfactory level of reliability (Cronbach's $\alpha=.83$ ).

The validity evidence of the ÉVIP was considered to support content, construct, and concurrent validity (Bachman, 1990). Content validity was supported by selection of the vocabulary items on the basis of vocabulary searchers and cross-references with age and grade level referenced vocabulary lists. Construct validity was supported by gradual increases over age
in percentage of participants who responded correctly to an item. Concurrent validity was established against the ÉVIP and other vocabulary tests. Coefficient of concurrences with the ÉVIP ranged from .36 to .86 with a median of .71 for the raw scores (Dunn et al., 1993a, p. 74). The median suggests adequate to high levels of content, construct and concurrent validity. The authors' inferences of the test's ability to measure scholastic aptitude are supported in the literature (Umberger, 1985). In reference to the norms given for Form A for ages 8 years to 8 years and 11 months old, the mean and standard deviation were 100.95 and 13.7, and for ages 9 years to 9 years and 11 months old, the mean and standard deviation were 100.37 and 15.2 respectively.

### 3.3.7 Morphological Awareness

Morphological awareness was measured with a task developed by Desrochers (2007). In this task, the participant was asked to read 60 sentences in French and fill in the missing word to make the sentence complete from a choice of four possible answers ${ }^{9}$ (see Appendix K). The missing word covered different parts of the speech, such as nouns, verbs, adjectives, prepositions, conjunctions and punctuation. A correct response had to make morphological sense to score one point. For example, "___ ont déchiré leurs pantalons." (a) Il, (b) Vous, (c) Ils, (d) Tu. The participant circled (c) Ils. Responses were recorded on the sheet by circling the right choice $\mathrm{a}, \mathrm{b}, \mathrm{c}$, or d . Seven practice items were given prior to administrating the test and the examiner gave instruction and corrective feedback at this time.

Each item was scored 1, or 0 as follows: (a) 1 point for the correct multiple choice that best completed the sentence, and (b) 0 points for the incorrect multiple choice. The maximum score on this task was 60 points. The raw score was used for the analysis.

[^7]Desrochers (2007) developed and validated experimental morphological awareness tasks on advanced reading skills for Grades 3 and 6 students in the provinces of Quebec and Ontario. Although designed for French native speaker, the author did a preliminary analysis of 250 items to identify the items according to their difficulties and sensitivity to individual differences and recommended the 60 most reliable items for the use with French immersion students in Grade 3. Desrochers (2007) integrated this task in the second part of a battery of multidimensional tasks for assessing reading comprehension (Batterie d'épreuves multidimensionnelles d'évaluation de la lecture - BÉMÉL). This task is in the process of being published. For reliability purposes, the internal-consistency reliability for the sample of the present study was calculated using Cronbach's alpha. This test had a satisfactory level of reliability (Cronbach's $\alpha=.79$ ).

### 3.3.8 Second Language Cultural Knowledge

The second language cultural knowledge task was designed to examine what culturespecific vocabulary readers produced and recognized. Second language cultural knowledge was measured using culture specific words from the two narrative passages (see Appendix L).

For the Second Language Cultural knowledge measure, previous research in second language inferencing and incidental vocabulary acquisition has demonstrated that increases in general second language reading ability and passage sight vocabulary are also accompanied by increases in inferencing. The common aspects (time, food, activities) of the French and Canadian culture served as the contexts within which three categories of words were situated as follows: (a) Target Words (TW) referred to cultural words in the story specific to lunch-recess in school, (b) Words Story Theme (WST) referred to cultural words in the story relevant to the school theme, and (c) Words Theme (WT) referred to words relevant to the school theme but not included in the story (see Appendix L for sample items for the culturally less and more familiar passage). The words were found on the list of words that should be common to Grade 3 readers,
or they were among the most frequent words in Baudot's (1992) Fréquences d'utilisation des mots en français écrit contemporain, edited in Montreal, Quebec, Canada (see Appendix L). The culturally less familiar story should not be linguistically less familiar to the reader.

Since the ability to recognize new lexical forms is considered to be an initial step in their acquisition, recognition memory of the cultural words (TW and WST) was assessed to tap intake (Pulido, 2003, 2004, 2007a, 2007b). "Intake was operationalized as a measure of accuracy in memory discrimination for recently processed information" (Pulido, 2007b, p. 168). This task of verifying whether or not certain words were presented within the stories that were read is assumed to tap episodic memory ${ }^{10}$. This task is an indirect measure of having noticed the cultural words while reading which should serve as a rough estimate of how deeply textual information was processed (Baddeley, 1998). In theory, the more superficially a new lexical item is processed the less accurate is the episodic memory discrimination (Baddeley, Aggleton, \& Conway, 2002; Tulving, 1972) for the cultural words. It becomes more difficult to associate the cultural words in question with the particular story context. It suggests that weaker memory traces of associations may have been made during reading among the new form, the context, and information stored in long-term memory.

In this task participants were required to make decisions as to whether or not individual second language cultural words appearing in a list had appeared in the passage they had previously read. For each word in the list participants were instructed to circle the individual second language cultural words if the word had appeared in the passage they had read previously. The task was self-paced with no time constraints. A total of 24 second-language cultural words were divided into three types: $T W, W S T$, and $W T$. The words without a translation were listed on the test form. The order of presentation of the 24 words was randomized. As the

[^8]presentation of the passage was counterbalanced, so was the list of words. Assessing recognition memory of the cultural words involved discriminating between words that were presented in the passages and those that were not. The maximum score on the cultural words recognition task was 16 points. If the participant said the cultural-specific words when recalling each story (see section 3.3.2), it was noted as cultural word production. The maximum score on the cultural word production task was 16 points. The raw score was used for the analysis.

### 3.3.9 Interviews

In order to find out more about second language cultural background knowledge, an interview was conducted after the second language cultural knowledge task had been administered. These interviews provided a more formal opportunity to discuss if, how, and why the participant believed a particular passage was more difficult to comprehend. Their engagement in a particular cultural setting could also be assessed and analyzed at the conclusion of each interview.

The interviews were semi-structured in design (Merriam, 1998) and focused on two open-ended questions. There was a possibility of adding new questions or follow-up questions to encourage participants to provide as much detail and information in order to follow through on interesting ideas. The two questions were: (a) Quelle histoire as-tu trouvée la plus facile des deux ? Pourquoi ? [Which story did you find the easiest among the two? Why?], and (b) Dans quelle histoire est-ce que tu aimerais être? Pourquoi? [In which story would you like to be? Why?] (Appendix M). Much of what the participants were asked depended on the individual participant's reading comprehension performance and second language cultural knowledge, as well as on his or her responses throughout the interview. The interviews were kept within a 5-10 minute range in duration.

The students were free to use French, English, or both during the interviews and the examiner generally used whichever language the student felt most comfortable with. Sometimes a switch was made to English if it elicited a more complete response from the participant or to French if it elicited specific words or sentence examples. The interviews were recorded on audiotape and later transcribed verbatim in the language used in the classroom, French. The researcher did not have the intention of translating the interviews to avoid misinterpretation in the translation. For the purpose of presenting and discussing the findings, in Chapters 4 and 5, excerpts chosen to substantiate the theme categories emerging from the data that were translated in English are italicized. Words were translated from French into English using The Collins Robert French-English dictionary (Atkins, Duval, Milne, Lewis, Sinclair, \& Birks, 1991). Data were also managed by carefully collecting field notes throughout the interviewing.

The interview transcripts were color-coded to mark the types of information that emerged from the data. A codebook was created with descriptions of each code, criteria and examples of text associated with each theme (Ryan \& Bernard, 2000). Both descriptive and interpretive codes were marked. Propositions that emerged from the observed data were organized into 'conceptual categories' taking into account both positive and negative cases (Taylor \& Bogden, 1984). Coded maps (Ryan \& Bernard, 2000) were established for a visual framework of the emerging analysis to enable the researcher to explore relationships between the themes. Software such as NVivo (QSR, 2006) was used for emerging themes and sub-themes. Participants' explanations of responses appeared to be related to one of the following salient categories: (a) for the first interview question, i.e., elements of the narrative and language of the text, and (b) for the second interview question, i.e., setting and social interactions. Within the context of each passage, elements of the narrative refer to the story structure and environment. Language of the text refers to the vocabulary (difficulty, length and knowledge and use of words). Setting of the story
included, curiosity, way of eating duration of lunch, and type of food. Social interactions included rapport of the characters in the story with friends and the teacher. A content analysis was performed. Participants' statements were transformed into quantitative data (frequency of occurrences of main statements) and discussed.

The results were consistent and dependable with the collected data. All interviews were audio-recorded and transcribed. This will facilitate the recording of detailed and reliable data results for referencing and analysis. This process allowed for an awareness of patterns emerging from the research (Fontana \& Frey, 2000; Johnson, 2002; Miller \& Crabtree, 2004).

### 3.3.10 Relationships Between Variables Tested in this Study

Second language literacy knowledge


Figure 2. Relationships between variables tested in the present study.

It is important to note several points from Figure 2 above. There is no posited relationship between word reading and reading comprehension. The present research intended to uncover if the same or different variables played a similar or different role in word reading and reading comprehension. Word reading as an outcome variable was only used to replicate a previous
study done by Bournot-Trites and Denizot (2005a) on predictors of word reading in French immersion students. Control for word reading in examining the relationship between morphological awareness and reading comprehension was accounted for. It will be explained in section 3.5 Data Analysis.

Spelling was not used as an outcome variable as the purpose of the present research was to establish what predicts French word reading and reading comprehension in French immersion Grade 3 students. Nevertheless this is an important question that should be addressed in a future research.

First language measures could also be part of this 'model'. Cross-linguistic contributions have been uncovered in that performance on a linguistic task in the first language is related to second language reading and vice-versa. As mentioned previously for first language literacy knowledge such as phonological awareness, French immersion students transfer English phonological knowledge to their acquisition of literacy in French (Comeau et al., 1999). For first language knowledge such as morphological awareness, French immersion students transfer English morphological knowledge to their acquisition of French literacy (Deacon et al., 2006). For the purpose of the present study participants were only tested in their second language. Larger sample sizes are needed to assess the equivalence of the transfer of phonological awareness and morphological awareness. The number of participants in the present study being equal to 72 and the ratio of 2 to 1 of first language English (45) to second language English (27) participants would not be enough. Some participants had also first languages with different orthography (14 Asian, 3 Arabic, 6 Slavic) which might have acted as an influence and/or impediment of the first language to the additional language 'French' (Geva \& Siegel, 2000).

### 3.4 Procedures of Administration

Trained graduate students and one learning assistance teacher in one school helped to conduct assessments in the schools. All experimenters were bilingual in French and English. The experimenters spoke French, the language of tests, as they administered the items for each test. Except for the researcher and the learning assistance teacher, the experimenters were not familiar to school staff and/or to participants. All the tasks were in French and the instructions for each task were given in French. If participants did not understand the instruction in French, the experimenters explained the instructions in English.

All the tasks were given in the same fixed order for all participants. This practice is common in correlational studies so that measurements will not be diluted by variance attributable to order effects. The order was as follows: spelling, morphological awareness, word reading, phonological awareness, vocabulary, verbal working memory, reading comprehension of isolated sentences, reading comprehension of narrative texts with cultural emphasis, and second language cultural knowledge. The order of presentation of the narrative passages was counterbalanced across all participants. The text "Le déjeuner" was presented first to $50 \%$ of the students of each division followed by the text "Le lunch" and vice-versa. The second language cultural knowledge task for each passage was also counterbalanced. Counterbalancing allowed the researcher to detect any practice effects.

Spelling and morphological awareness tasks were administered in a group setting in the classrooms by the researcher. The group setting lasted 60 minutes. The spelling and morphological awareness tasks were presented in the same order to each division in both schools. Participants started with the spelling task. The spelling task was presented orally and required a written answer. Participants were then given the morphological awareness task. The morphological awareness task was presented in writing and also required a written answer.

Several practice items with corrective feedback were presented before the experimental items for morphological awareness.

The remaining tasks including word reading, phonological awareness, vocabulary, verbal working memory, reading comprehension (of isolated sentences, and of narrative texts with cultural emphasis) and second language cultural knowledge were administered individually in that order. Each participant was assessed in a quiet room lasting 60 minutes. The word reading, phonological awareness, vocabulary, verbal working memory and reading comprehension of isolated sentences tasks were presented orally in the same order for each participant and required an oral answer from the child. Several practice items with corrective feedback were presented before experimental items for the phonological awareness, vocabulary, verbal working memory and reading comprehension of isolated sentences tasks. Participants needed to be successful on the practice items before continuing with the experimental items.

The participants were also given the reading comprehension of narrative texts with cultural emphasis and second language cultural knowledge tasks. Each participant was asked to first read aloud one of the narrative passage with no time constraints. Reading aloud was a common task that participants regularly performed in class. Before reading the passage, all participants were oriented to the task of reading the text carefully in order to comprehend the substance in order to recall and answer comprehension questions about the stories. Participants' reading speed was recorded. For each passage, participants started with the recall measure, followed by the literal comprehension questions and the second language cultural knowledge task (culture specific vocabulary as presented on the cultural words sheet). Participants then read the second passage following the same steps. Participants were then asked to compare the passages by answering three inferential questions.

After reading the first passage, each participant was asked to retell in oral fashion as much detail of the story read: "Imagine the teacher enters in the classroom and asks you what happened in the story because he/she did not read the story. What would you tell your teacher? Tell your teacher all you remember." In the French immersion context, the language of literacy instruction for all of the students since Kindergarten is French. Questioning was performed in French but children could recall in English or French. Although some students had a first language other than English, all students spoke English. Although language of assessment with second language populations is critical (Lee, 1986a, 1986b; Shohamy, 1982, 1984, 2001), the French immersion context is different as students start their formal literacy in French in Kindergarten. As all participants started their schooling in Canada in Kindergarten in French immersion, recalling in French did not seem to impede their performance.

Literal comprehension questions were also asked. Afterwards, participants were instructed to circle on the Cultural Words sheet any word that had appeared in the passage. The free recall and comprehension questions were presented orally but the second language cultural knowledge task was done in writing. Once participants had completed all three tasks for the first passage (recall measure, literal comprehension questions, cultural words sheet), they read the second passage following the same procedures than the first one. Participants were then asked to answer three inferential questions drawing on a comparison of the two passages. The whole procedure was audio-recorded.

### 3.5 Data Analysis

Quantitative and exploratory qualitative measures were employed in this analysis. Quantitative and qualitative data was collected, but priority was given to quantitative data. The methods used to analyze and interpret the information gathered centered mainly on the principles of quantitative data analysis using SPSS with some exploratory qualitative analysis using NVivo
(QSR, 2006). After the data were gathered, a procedure called hierarchical regression analysis was used to analyze quantitative results obtained. The exploratory qualitative analysis was done with the content analysis of interview transcripts.

In the quantitative analysis, the use of hierarchical regressions enabled the researcher to find the importance of each predictor variable (phonological awareness, spelling, verbal working memory, vocabulary, morphological awareness and second language cultural knowledge) in word reading and reading comprehension (of isolated sentences, and of narrative texts with cultural emphasis). The effect size and the percentage of explained variance each variable contributed to word reading and reading comprehension was calculated (Tabachnick \& Fidell, 2001). Data were analyzed in accordance with successful completion on the practice items, although the participant may not have been successful on the experimental items themselves. Most participants got the practice items right. If participants did not get the practice items right the first time, they were given a chance to do them a second time. All participants who were given the practice items a second time, had them right the second time. Raw scores were used for the analysis because about half of the measures used in this study did not have standardized scores. The present study did not include nonverbal intelligence as a control variable.

The computer does not take into account the theory to determine which variables are important. To take into account theory, hierarchical regressions were used to determine which variables predicted word identification, reading comprehension of isolated sentences and reading comprehension of narrative texts with cultural emphasis. In a hierarchical regression, the researcher decides not only how many predictors to enter but also in which order they enter. The order of entry is usually based on logical or theoretical considerations. The value of alpha was set at .05 , which means that a $p$ value $<.05$ showed a statistically significant result. The critical value of the $F$ value for significance was set at $p<.05$.

According to Hair, Black, Babin, Anderson, \& Tatham (2005), there should be 10 participants for each predictor variable. The sample size for this study was 72. Each separate hierarchical regression had no more than six predictor variables entered.

To answer research question 1, the first hierarchical regression included one outcome variable (word reading) and five predictor variables (vocabulary, verbal working memory, phonological awareness, spelling, and morphological awareness). To control for vocabulary and verbal working memory, these variables were entered first because they pertain to general cognitive functioning and oral language. Given the importance of phonological awareness in reading theories, it was entered in as the second variable (i.e., in the second step of the regression). This would make the findings of any further significant variables more powerful. The remaining variables were entered in the next step.

To answer research question 2 , the second hierarchical regression included one outcome variable (reading comprehension of isolated sentences) and six predictor variables (vocabulary, verbal working memory, word reading, phonological awareness, spelling, and morphological awareness). To control for vocabulary and verbal working memory, these variables were entered first because they pertain to general cognitive functioning and oral language. As mentioned in section 3.3, although a relationship exists between word reading and reading comprehension, the present research intended to uncover if the same or different variables played a similar or different role in word reading and reading comprehension. Control for word reading in examining the relationship between morphological awareness and reading comprehension was accounted for, entering it in the second step of the regression. This was an effective way of controlling for word reading and preventing this confound. Phonological awareness and spelling were entered in the third and fourth step respectively. Morphological awareness was entered in the fifth step of the regression.

To answer research question 3, four independent hierarchical regressions were conducted as there were one less and one more familiar passage. There were two independent outcome variables for each passage: comprehension questions and recall of ideas. The regression for the less familiar passage included: (a) one outcome variable (recall less familiar) and six predictor variables (second language cultural knowledge production less familiar, phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness), and (b) one outcome variable (comprehension questions less familiar passage) and six predictor variables (verbal working memory, second language cultural knowledge production less familiar vocabulary, phonological awareness, spelling, and morphological awareness). The same regressions were conducted for the more familiar passage. To control for verbal working memory, it was entered in the first step of the regression. Second language cultural knowledge was entered in the second step of the regression, followed by vocabulary, and morphological awareness. The remaining variables were entered in the next step.

Student $\boldsymbol{t}$-test was used to examine whether there were significant differences among the students reading comprehension of the two cultural passages. The differences were tested in four distinct areas: (a) reading speed, (b) recall scores (main idea, supporting idea, detail recall and connecting words), (c) comprehension questions (literal and inferential), and (d) cultural words recognition and production. A Bonferroni correction was used to correct for multiple testing within a sample. The Bonferroni correction was calculated as $\alpha / \mathrm{p}: \alpha$ is the significance level (.05), and $p$ is the number of comparisons. In the present study, 17 comparisons were done between the less and more familiar passages. As they were 17 comparisons the Bonferroni adjustment was $.05 / 17=.0029$. The conclusions were based on a .0029 significance level.

An exploratory qualitative analysis was also conducted. The analysis aimed to determine if participants perceived differences of cultural elements in the comprehension of the cultural
passages. An exploratory qualitative analysis of participants' answer to the two interview questions was performed. The objectives of the exploratory qualitative analysis identified factors that elicited information regarding the participants' comprehension of the cultural passages. The participants' perceptions of their responses as they appear to be related to one of the following salient categories: elements of the narrative, language of the text, setting and social interactions was also noted.

The general approach suggested by Creswell (2003) was adopted as a guide in the analysis of the interview transcripts. The questions of the interviews were used as a guide when creating the main coding categories. The interview transcripts were color-coded to mark the types of information that emerged from the data. The initial categories and the interviews statements they contained led to a more detailed analysis of the data. Themes and patterns were identified through repetitious surveys of the data and organized in various text summaries, analytical tables and matrix of qualitative findings (Anfara, Brown, \& Mangione, 2002). The qualitative data was then quantified by counting the number of times statements corresponding to a specific theme or category occurred.

Although analysis and interpretation are usually taken as a single process, a clear distinction exists between the two in qualitative research. According to Wolcott (1994), analysis is the process whereby key factors and relationships among data are carefully and systematically identified and isolated. Interpretation, on the other hand, is whereby one seeks to impose meaning on one's data or making sense of one's data (Wolcott, 1994). In this study my analysis of data was separated from its interpretation. The analysis consisted of categorizing data into manageable themes, identifying and isolating what was important to note, what was learned and what could be reported about the findings of my research.

Some complementary exploratory qualitative measures also helped answer some questions (for example perception in the difficulty of the narrative texts with cultural emphasis and engagement towards a cultural text) that the quantitative approach could not answer in the present study. Consistent with the requirements for analyzing data (Wolcott, 1994), the participants' own words where appropriate were used. As is customary in exploratory qualitative research, the analysis of the data presented here was done continuously. Major recurrent themes were identified and isolated as they emerged: perceptions of participants developed from the analysis of data.

The second stage at which analysis of data was done in the research was after the researcher exited the research site. This is the stage when data from the audio-taped interview was transcribed. The interpretation of data in this exploratory qualitative research was undertaken when the researcher had to make sense of the data. The data was examined in the interpretation stage against the background of the literature reviewed in Chapter 2.

Bringing together quantitative and some exploratory qualitative data analysis enabled the researcher to integrate both data in the analysis phase (Tashakkori \& Teddlie, 1998). This enhanced the validity, reliability and dependency of the results. Validity was achieved in quantitative methods by respecting empirical validity, population validity and content validity. The content of the test must be representative of the domains it is purported to measure to insure empirical validity. In the present study, the primary function for which the experimental tasks were developed was to have an individualized screening test to indicate the relative achievement of elementary pupils in phonological awareness, spelling, verbal working memory, vocabulary, morphological awareness, second language cultural knowledge, word reading and reading comprehension of isolated sentences and narrative texts with cultural emphasis. For population validity, the population whom the experimental tasks were used for was similar to those on
whom the various experimental tasks were normed. Content validity was achieved as the content of the test reflected many of the materials used in French immersion programs across British Columbia. The test was valid for the purpose for which it was intended, and the results obtained by its use were not suspect.

### 3.6 Summary of Measures and Research Questions

Table 4 shows links between the measures used in the study, the corresponding questions and the method of analysis.

Table 4

Summary of Research Questions, Quantitative and Exploratory Qualitative Measures, and
Data Analysis

| Research Question | Question 1: What is the best predictor of word reading among phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness in Grade 3 French immersion students? |  |
| :---: | :---: | :---: |
| Quantitative Measures \& Data Analysis |  | Descriptive Statistics and Hierarchical Regression Analysis |
|  | FIAT Word Identification Subtest (Wormeli \& Ardanaz, 1987) | Raw score (/86) Reliability coefficient (.96) |
|  | Phonological Awareness <br> (Bournot-Trites \& Denizot, 2005b) | Raw score (/20) Reliability coefficient (.82) |
|  | FIAT Spelling Subtest <br> (Wormeli \& Ardanaz, 1987) | Raw score (/55) Reliability coefficient (.83) |
|  | Verbal Working Memory - Digit Span Test Supplementary Verbal Test of the Wechsler Intelligence Scale for Children (WISC-R) (Wechsler, 1974) | Raw score (/28) Reliability coefficient (.81) |
|  | Échelle Vocabulaire en Images Peabody (ÉVIP) (Dunn et al., 1993b) | Raw score (/170) Reliability coefficient (.83) |
|  | Morphological Awareness (Desrochers, 2007) | Raw score (/60) Reliability coefficient (.79) |


| Research Question | Question 2: What is the best predictor of reading comprehension among phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness in Grade 3 French immersion students? |  |
| :---: | :---: | :---: |
| Quantitative <br> Measures \& Data <br> Analysis |  | Descriptive Statistics and Hierarchical Regression Analysis |
|  | Épreuve d'Évaluation de la Compétence en Lecture - Révisée (LMC-R), Compréhension en Lecture (Khomsi, 1999) | Raw score (/21) Reliability coefficient (.69) |
|  | Phonological Awareness <br> (Bournot-Trites \& Denizot, 2005b) | Raw score (/20) Reliability coefficient (.82) |
|  | FIAT Spelling Subtest (Wormeli \& Ardanaz, 1987) | Raw score (/55) Reliability coefficient (.83) |
|  | Verbal Working Memory - Digit Span Test Supplementary Verbal Test of the Wechsler Intelligence Scale for Children (WISC-R) (Wechsler, 1974) | Raw score (/28) <br> Reliability coefficient (.81) |
|  | Échelle Vocabulaire en Images Peabody (ÉVIP) (Dunn et al., 1993b) | Raw score (/170) <br> Reliability coefficient (.83) |
|  | Morphological Awareness (Desrochers, 2007) | Raw score (/60) Reliability coefficient (.79) |


| Research Question | Question 3: What is the relative role of second language cultural knowledge compared to phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness in Grade 3 French immersion students' reading comprehension? |  |
| :---: | :---: | :---: |
| Quantitative Measures \& Data Analysis |  | Descriptive statistics and Hierarchical <br> Regression Analysis |
|  | Recall of Cultural Passages | Raw score (/87) |
|  | Comprehension Questions of Cultural Passages | Raw score (/12) |
|  | Phonological Awareness <br> (Bournot-Trites \& Denizot, 2005b) | Raw score (/20) Reliability coefficient (.82) |
|  | FIAT Spelling Subtest <br> (Wormeli \& Ardanaz, 1987) | Raw score (/55) Reliability coefficient (.83) |
|  | Verbal Working Memory - Digit Span Test Supplementary Verbal Test of the Wechsler Intelligence Scale for Children (WISC-R) (Wechsler, 1974) | Raw score (/28) <br> Reliability coefficient (.81) |
|  | Échelle Vocabulaire en Images Peabody (ÉVIP) (Dunn et al., 1993b) | Raw score (/170) Reliability coefficient (.83) |
|  | Morphological Awareness (Desrochers, 2007) | Raw score (/16) <br> Reliability coefficient (.79) |
|  | Second Language Cultural Knowledge Recognition | Raw score (/16) |
|  | Second Language Cultural Knowledge Production | Raw score (/16) |


| Research Question | Question 4: What do French immersion Grade 3 students perceive as <br> different in the culturally less and more familiar text that affected <br> their reading comprehension and which cultural context do they <br> prefer and why? |  |
| :--- | :--- | :--- |
| Qualitative Measure | Participant's Interviews | Transcription, <br> compilation, and <br> thematic analysis of <br> responses. <br> Participants' <br> statements <br> transformed into <br> quantitative data <br> (frequency of main <br> statements) and <br> discussed. |

## CHAPTER 4: RESULTS

Quantitative and exploratory qualitative measures were used in the present study to answer the four main research questions. The data obtained from these measures will be reviewed in this chapter as they were analyzed by statistical, thematic organization and descriptive procedures. The measures used to obtain the data and the procedures used to analyze that data are detailed in Chapter 3. The quantitative results and the qualitative interview findings of the research questions will be presented in the following order: predictors of word reading (Question 1), predictors of reading comprehension of isolated sentences (Question 2), predictors of reading comprehension of narrative texts with cultural emphasis (Question 3), and participants' perception of differences in the culturally less and more familiar passages and engagement towards the cultural context (Question 4).

The quantitative results are outlined in the order above using the following indicators: predictors of word reading, reading comprehension of isolated sentences and reading comprehension of narrative texts with cultural emphasis are presented with the supporting descriptive statistics and quantitative results based on hierarchical regressions. Comprehension of cultural passages is assessed using participants' results on the recall, comprehension questions and propositional cultural words sheet. The exploratory qualitative data analysis from the interview questions providing findings to research question 4 substantiates the quantitative data analysis of question 3 and the ensuing discussion.

All 72 participants in the study answered the two open-ended questions on key aspects of the current research. All the respondents were assigned numbers followed by B (identifying a boy) or G (identifying a girl) to protect their anonymity and ensure confidentiality.

### 4.1 Quantitative Results

The analysis was done using hierarchical regressions with the ordinary least square as an estimation method to determine the importance of each predictor variable in word reading, reading comprehension of isolated sentences and reading comprehension of narrative texts with cultural emphasis in Grade 3 French immersion students. The variance of variables predicting word reading, reading comprehension of isolated sentences and reading comprehension of narrative texts with cultural emphasis was calculated. There were no missing values and the cases for analysis in this study were 72 participants. Quantitative results will be presented starting with descriptive statistics followed by correlations and regression analyses corresponding to research questions 1 to 3 .

### 4.1.1 Descriptive Statistics

Means, standard deviations, ranges and skewness for all variables are shown in Table 5. These are raw scores.

Table 5
Ranges, Means, Standard Deviations, and Skewness of Outcome and Predictor Variables
in Grade 3 French $(n=72)$

| Variable | Min | Max | M | SD | Skewness |
| :--- | :---: | :---: | :---: | :---: | :---: |
| 1. Word Identification (FIAT) /86 | 3 | 82 | 48.65 | 16.00 | -0.23 |
| 2. Reading Comprehension (LMC-R) /21 | 4 | 19 | 13.04 | 2.68 | -0.29 |
| 3. Comprehension Questions Less Familiar /12 | 1 | 11 | 7.33 | 2.32 | -0.77 |
| 4. Comprehension Questions More Familiar /12 | 4 | 11 | 8.19 | 1.87 | -0.28 |
| 5. Recall Ideas Connections Less Familiar /87 | 0 | 81 | 24.15 | 12.69 | 1.35 |
| 6. Recall Ideas Connections More Familiar /87 | 5 | 79 | 25.83 | 14.30 | 0.74 |
| 7. Phonological Awareness /20 | 0 | 20 | 10.22 | 4.99 | -0.25 |
| 8. Spelling (FIAT) /55 | 2 | 36 | 14,51 | 7.48 | 0.77 |
| 9. Verbal Working Memory (WISCR) /28 | 4 | 17 | 9.67 | 2.29 | 0.31 |
| 10. Vocabulary (ÉVIP) /170 | 64 | 127 | 89.13 | 13.40 | 0.52 |
| 11. Morphological Awareness /60 | 14 | 48 | 27.64 | 7.57 | 0.35 |
| 12. Cultural Word Recognition Less Familiar /16 | 0 | 16 | 9.74 | 2.82 | -0.64 |
| 13. Cultural Word Production Less Familiar /16 | 0 | 12 | 3.39 | 2.26 | 1.01 |
| 14. Cultural Word Recognition More Familiar /16 | 7 | 15 | 12.04 | 1.86 | -0.40 |
| 15. Cultural Word Production More Familiar /16 | 0 | 14 | 5.43 | 2.76 | 0.62 |

Note: Variables 1 to 6 are the outcome variables and variables 7 to 15 are the predictor variables. Cultural Word Recognition is the number of Target Words and Words Story-Theme a child recognized on the cultural words sheet after reading each passage. Cultural Word Production is the number of Target Words and Words Story-Theme a child said when recalling each passage.

Data were also inspected for each of the predictor and outcome variables for assumptions of linearity, independence of errors, normality and equality of variance.

Linearity is important because Pearson's correlation can confine the linear relationship among variables (Tabachnick \& Fidell, 2001). The linearity assumption was assessed by examining the scatterplot with the simple regression line for each predictor variable with the outcome variable looking for a straight-line relationship between variables. No violation was noted in the scatterplots of Word Identification (FIAT), Reading Comprehension of Isolated Sentences (LMC-R), Recall of Ideas and Connection of the less and more familiar passages and Comprehension Questions of the less and more familiar passages with each predictor variable as the data points were distributed equally.

In terms of the independence assumption, by looking at the design of the model and visualizing the data, there was no evidence of violation of this assumption. Each participant answered each task individually and independently of each other.

In reference to the normality assumption, grom Table 5, all the skewness values are inferior to 1 , with the exception of Recall Ideas Connections Less Familiar (skewness $=1.35$ ) and Cultural Word Production Less Familiar (skewness $=1.01$ ). The skewness values are within a safe range ${ }^{11}$. Four outcome variables, Word Identification (FIAT), Reading Comprehension of Isolated Sentences (LMC-R) and Comprehension Questions for both the less familiar and more familiar passages were negatively skewed. The two remaining outcome variables Recall of Ideas and Connections for both the less familiar and more familiar passages were positively skewed. Three predictor variables, Phonological Awareness and Cultural Word Recognition for both the less and more familiar passages were also negatively skewed. All other variables were positively skewed.

From the boxplot of the standardized residuals, the distribution of the four above mentioned negatively skewed outcome variables showed from the way that the median line is not

[^9]centered within the box and the whiskers are of different lengths (Miles \& Shevlin, 2001). The residuals points appeared to be fairly symmetrically distributed above and below the zero line and there was no violation of this assumption.

The equal variance's assumption is assumed was examined through the scatterplot for the standardized residuals and predictor variables and the scatterplot for the standardized predicted value of each predictor variable with the outcome variable. The residuals appeared as an unstructured horizontal band centered at zero (mean of residuals) with no evidence of curved or fan shape and there was no violation of this assumption.

Examining the influential data point, one outlier (data point far from the bulk of the residuals) was seen in the boxplot of the residuals for the regression on Reading Comprehension of Isolated Sentences (LMC-R), on Comprehension Questions Less Familiar, on Recall Ideas and Connections Less Familiar and on Recall Ideas and Connections More Familiar. The maximum leverage point found was .208 . All values for the regressions were below .5 and were within the safe range (Huber, 1981). The outlier was not removed from the data set.

To draw a more precise picture of differences between less and more familiar cultural passages, a paired sample $t$-test was used. The sample $t$-test examined whether significant differences existed among the students' reading comprehension of the two narrative texts with cultural emphasis. The differences were tested on five distinct areas: (a) reading speed, (b) recall scores (main idea, supporting idea, and detailed idea recall and connecting words), (c) comprehension questions (literal and inferential), (d) cultural word production, and (e) cultural word recognition (target words and words story-theme). Table 6 reports the means of the culturally less and more familiar passages and shows the tasks that were statistically significant.

Table 6

Differences for Cultural Passage Measure Between Culturally Less and More Familiar Passage Comprehension in Grade 3 French $(n=72)$

| Cultural Passage Measure | Less Familiar |  | More Familiar |  | $t(71)$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | M | SD | M | SD |  |
| Reading Speed (words/min) | 86.52 | 26.72 | 95.24 | 27.24 | -6.25*** |
| Total Idea of Unit Analysis (Recall) /87 | 24.15 | 12.69 | 25.83 | 14.30 | $-1.23$ |
| Main Ideas /27 (weighted x3) | 11.17 | 5.52 | 8.42 | 5.80 | 3.63** |
| Supporting Ideas /22 (weighted x 2 ) | 6.78 | 4.41 | 8.03 | 4.97 | $-2.06$ |
| Details /24 (weighted x1) | 3.72 | 3.66 | 6.53 | 3.93 | -6.33*** |
| Connecting Words /14 (weighted x1) | 2.49 | 2.30 | 2.86 | 2.18 | -1.41 |
| Total Comprehension Questions /12 | 7.33 | 2.32 | 8.19 | 1.87 | -3.69*** |
| Literal Questions /7 | 5.00 | 1.41 | 5.10 | 1.32 | -. 56 |
| Inferential Questions /5 | 2.33 | 1.32 | 3.10 | 1.13 | -5.09*** |
| Total Cultural Word Recognition /16 | 9.74 | 2.82 | 12.04 | 1.86 | -7.02*** |
| Target Words /8 | 5.28 | 1.66 | 5.57 | 1.17 | -1.44 |
| Words Story-Theme /8 | 4.46 | 1.70 | 6.47 | 1.18 | -8.81*** |
| Words not in the Story /8 | . 99 | 1.06 | . 79 | . 92 | 1.49 |
| Total Cultural Word Production /16 | 3.39 | 2.26 | 5.43 | 2.76 | -5.71*** |
| Target Words /8 | 1.93 | 1.30 | 2.99 | 1.45 | -5.19*** |
| Words Story-Theme /8 | 1.46 | 1.34 | 2.44 | 1.89 | -3.96*** |
| Words not in the Story /8 | . 08 | . 28 | . 14 | . 35 | -1.16 |

Note. The Bonferroni adjustment was .0029 . The conclusions were based on a .0029 significance level.

In general terms, participants performed better on the more familiar story than the less familiar story in all categories except for the recalling of main ideas where they did better in the less familiar passage. As reported in Table 6, participants read the culturally more familiar text nearly $10 \%$ faster than the culturally less familiar text. Participants recalled $6 \%$ more of the supporting ideas and $12 \%$ more details of the culturally more familiar story than the less familiar story. However, participants recalled more of the main ideas of the culturally less familiar text than the more familiar text. They recalled $10 \%$ more main ideas.

When participants recalled each story, they said $13 \%$ more of both the cultural targeted and story-theme words of the culturally more familiar story. After reading each story, participants also recognized $25 \%$ more cultural story-theme words of the culturally more familiar text compared to the less familiar text. Participants recalled on average approximately the same number of the targeted words for each passage. In terms of cultural reading comprehension measured by answering literal and inferential questions, the total score on the questions was $7 \%$ higher for the culturally more familiar passage. Participants also inferred $15 \%$ more from culturally the more familiar than the less familiar story.

### 4.1.2 Correlations

Pearson correlations among the outcome and predictor variables are shown in Table 7. None of the negative correlations were statistically significant.
Table 7
Correlation Matrix of Outcome and Predictor Variables in Grade 3 French $(n=72)$

| Variable | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1. WI | . 22 | . 11 | . 10 | -. 17 | . 02 | .62... | . $55 \cdots$ | . $35 \cdot$ | .35* | .39. | . 16 | . 11 | -. 08 | -. 00 |
| 2. RC |  | 32.* | . 09 | 27. | . 07 | . 18 | .24* | . 06 | .27* | .46... | . $31 \times$ | .25* | .29* | -. 03 |
| 3.CQLF |  |  | .57... | .44*. | .25* | . 18 | . 13 | . 01 | .39.* | . 15 | .53... | .41... | . 16 | . 21 |
| 4. CQMF |  |  |  | . 19 | .25* | -. 09 | . 14 | -. 05 | .33.* | . 12 | .42... | . 22 | .28. | .30. |
| 5. RICLF |  |  |  |  | .63... | . 15 | -. 05 | -. 17 | 20 | .30* | . 22 | .77... | . 09 | .39.* |
| 6. RICMF |  |  |  |  |  | . 19 | . 07 | -. 05 | .24. | . 21 | 23 | .50.. | . 03 | .77... |
| 7. PA |  |  |  |  |  |  | .44... | . 38. | .31* | .29* | 11 | .36. | -. 17 | . 15 |
| 8.5 |  |  |  |  |  |  |  | . 20 | .48... | . $62 \cdots$ | . 17 | .28. | -. 11 | . 05 |
| 9. vwM |  |  |  |  |  |  |  |  | . 20 | . 21 | . 04 | -. 09 | - 10 | . 12 |
| 10.v |  |  |  |  |  |  |  |  |  | .41… | . 30 | .34. | -. 02 | . 10 |
| 11. MA |  |  |  |  |  |  |  |  |  |  | .26. | .33.. | . 06 | . 15 |
| 12. CWR LF |  |  |  |  |  |  |  |  |  |  |  | .36.* | .35* | .28. |
| 13. CWP LF |  |  |  |  |  |  |  |  |  |  |  |  | -. 01 | .28. |
| 14. CWR Mr |  |  |  |  |  |  |  |  |  |  |  |  |  | . 03 |
| 15. CWP MF |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

[^10]From Table 7, Word Identification was highly correlated with phonological awareness (.62) and spelling (.55). Correlations of other measures with the outcome variable were modest, ranging from .35 to .39 . Reading Comprehension of Isolated Sentences was highly correlated with morphological awareness (.46) and vocabulary (.43). Correlations of other measures with the outcome variable were low, ranging from .06 to .24 . Also, they were not always significant.

In regards to reading comprehension of narrative text with less familiar cultural emphasis (France), cultural word recognition less familiar was highly correlated (.53) to the outcome variable Comprehension Questions Less Familiar. Correlations of other measures with the Comprehension Questions Less Familiar outcome variable were in general modest, ranging from .01 to .40 . They were not always significant. Cultural word production less familiar was highly correlated (.77) with the outcome variable Recall of Ideas and Connections Less Familiar. Correlations of other measures with the outcome variable were modest, ranging from .15 to .30 . Also, they were not always significant.

Concerning reading comprehension of narrative text with more familiar cultural emphasis (Canada), vocabulary (ÉVIP) had the highest correlation (.33) with the outcome variable Comprehension Questions More Familiar. Correlations of other measures with the outcome variable were modest, ranging from .14 to .30 . They were not always significant. Cultural word production more familiar was highly correlated (.77) with the outcome variable Recall of Ideas and Connections More Familiar. Correlations of other measures with the Recall of Ideas and Connections More Familiar outcome variable were in general modest, ranging from .03 to .24 . Also, they were not always significant.

The correlation matrices for the correlation between the predictor variables showed no correlations values above .90 (Tabachnick \& Fidell, 2001). Multicollinearity indicated that no two outcome variables were too highly correlated, all below .70 (Tabachnick \& Fidell, 2001).

The Variance Inflation Factor (VIF) values for each of the predictor variables were within the safe range, below 4 . The highest VIF value was 2.07 for spelling on Recall of Ideas and Connections More Familiar (Canada) passage. The VIF for the models were all below 2.50 . In addition, Eigenvalues were all above one, the maximum value being 2.95 for the regression on Reading Comprehension of Isolated Sentences (LMC-R). The VIF and Eigenvalues recorded no evidence of multicollinearity among the predictor variables. The models constitute a coherent representation of the data being studied.

### 4.1.3 Regression Analyses

The independent contributions of the various variables to word reading, reading comprehension of isolated sentences and reading comprehension of narrative texts with cultural emphasis in a series of hierarchical regression analyses were examined.

In addressing each research question, concurrent relationships between outcome measures and predictors to reading were analyzed. Each of the analyses is outlined in turn. In each of the subsequent tables, $B, S E B, \beta, t, R^{2}$, Adjusted $\Delta R^{2}$, and Pratt Index $\left(d_{j}\right)^{12}$ are reported. The relative Pratt Index (Thomas, Hughes, \& Zumbo, 1998) is used for ordering the importance of predictor variables. The variable ordering procedures are based on partitioning an $R^{2}$ measure for each predictor variable. One can attribute a certain proportion of the overall $R^{2}$ to each predictor and order the predictor variables in terms of the proportion of the $R^{2}$ that is attributable to each. The higher value will be first in order. If $d_{j}<1 /\left(2^{*} P\right)(\mathrm{P}=$ number of predictor variables entered in the model), the variable is considered unimportant (Thomas, 1992). For statistical analysis purposes, models that had a higher variance $\left(R^{2}\right)$ were selected and compared with each other. Looking for the $R^{2}$ change, no other models were adding a significant contribution to the

[^11]model. Subsequent sections give the candidate model for each of the regression corresponding to research questions 1 to 3 .

### 4.1.3.1 Research Question 1 (Word Reading)

The first research question was designed to identify which were the best predictors of word reading among phonological awareness, verbal working memory, spelling, vocabulary, and morphological awareness in Grade 3 French immersion students.

Table 8 provides the candidate model for the regression on word identification (FIAT). The regression model on word identification (FIAT) was statistically significant for the regression, $F(2,69)=31.61, p<.001$. As reported in Table 8, the regression analysis further revealed that phonological awareness contributed to approximately $37 \%$ and spelling (FIAT) 9\%, to word identification (FIAT).

Table 8
Model for the Hierarchical Regression on Word Identification (FLAT) in Grade 3 French ( $n=72$ ). Predictors Entered in Order: Vocabulary, Verbal Working Memory, Phonological Awareness, Spelling, and Morphological Awareness

| Outcome and <br> Predictor | $B$ | $S E B$ | $\beta$ | $t$ | $R^{2}$ | $R^{A d j} \Delta$ | $d_{j}$ | df | $F$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| WI (FIAT) |  |  |  |  |  |  |  |  |  |
| PA | 1.49 | 0.31 | .47 | $4.80^{* * *}$ | .38 | .37 | .61 |  |  |
| S (FIAT) | 0.74 | 0.21 | .35 | $3.57^{* *}$ | .48 | .09 | .39 | $(2,69)$ | $31.61^{* * *}$ |

Note. Abbreviations of variables signify the following in order: WI (FIAT) (Word Identification FIAT), PA (Phonological Awareness), and S (FIAT) (Spelling FIAT).
*** $p<.001 .{ }^{* *} p<.01 .{ }^{*} p<.05$.

According to Cohen (1992), given the relationship between the effect size $\left(f^{2}\right)^{13}$ and $R^{2}$ for the model with phonological awareness and spelling, the value of $R^{2}$ was large (.48). The effect size for the candidate model was also large (.92). The relative importance of each predictor variable to the regression model as shown in Table 8 was assessed by the relative Pratt Index (Thomas et al., 1998). According to the relative Pratt index in Table 8, phonological awareness $\left(d_{j}=.61\right)$ and spelling (FIAT) $\left(d_{j}=.39\right)$ are, in relative order, the most important predictor variables in the regression on word identification (FIAT). Based on the principle, if $d j<1 / 2 p=$ .10 ( $p$ is the number of predictor variables), all the other variables were considered unimportant. This result was also confirmed by $\sum \beta_{j}(1-1)=0<.10$. All other variables were removed.

### 4.1.3.2 Research Question 2 (Reading Comprehension of Isolated Sentences)

The second research question was directed at identifying the best predictors of reading comprehension of isolated sentences among phonological awareness, verbal working memory, spelling, vocabulary and morphological awareness in Grade 3 French immersion students.

Table 9 provides the candidate model for the regression on reading comprehension of Isolated Sentences (LMC-R). The regression model on reading comprehension of isolated sentences (LMC-R) was statistically significant, $F(1,70)=18.43, p<.001$. The regression analysis further revealed that morphological awareness contributed to approximately $20 \%$ to reading comprehension of isolated sentences (LMC-R).

[^12]
## Table 9

Model for the Hierarchical Regression on Reading Comprehension of Isolated
Sentences (LMC-R) in Grade 3 French $(n=72$ ). Predictors Entered in Order:
Vocabulary, Verbal Working Memory, Word Reading, Phonological Awareness, Spelling, and Morphological Awareness

| Outcome and <br> Predictor | $B$ | $S E B$ | $\beta$ | $t$ | $R^{2}$ | $R^{2}$ | df | $F$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| RC (LMC-R) |  |  |  |  |  |  |  |  |
| MA | 0.16 | 0.04 | .46 | $4.29^{* * *}$ | .21 | .20 | $(1,70)$ | $18.43^{* * *}$ |

Note. Abbreviations of variables signify the following in order: RC (LMC-R) (Reading Comprehension of Isolated Sentences LMC-R), and MA (Morphological Awareness).
*** $p<.001$. $^{* *} p<.01$. $^{*} p<.05$.
According to Cohen (1992), given the relationship between the effect size $\left(f^{2}\right)$ and $R^{2}$ for the model with morphological awareness, the value $R^{2}$ was large (.21). The effect size for the candidate model was medium (.27). According to the relative Pratt index in Table 9, morphological awareness $\left(d_{j}=1\right)$ is, in relative order, the most important predictor variables in the regression on reading comprehension of isolated sentences.

### 4.1.3.3 Research Question 3 (Reading Comprehension of Narrative Texts with Cultural Emphasis)

The third research question examined the relative role of second language cultural knowledge compared to phonological awareness, verbal working memory, spelling, vocabulary and morphological awareness in Grade 3 French immersion students' reading comprehension of narrative texts with cultural emphasis. Reading comprehension of narrative texts with cultural emphasis was measured respectively by comprehension questions and recall of ideas and connections. The role of second language cultural knowledge as measured by cultural word production (targeted words children said in their recall) and by cultural word recognition
(targeted words children recognized on the cultural words sheet) was compared to phonological awareness, spelling, verbal working memory, vocabulary, and morphological awareness.

Table 10 outlines the candidate model for the regression on reading comprehension of narrative texts with cultural emphasis measured by comprehension questions on the less familiar (France) and more familiar (Canada) passage. Table 11 outlines the second candidate model for the regression on reading comprehension of narrative texts with cultural emphasis measured by recall of ideas and connections on the less familiar (France) and more familiar (Canada) passage.

### 4.1.3.3.1 Comprehension Questions of Narrative Texts with Cultural

## Emphasis

Table 10 provides the candidate model for the regression on reading comprehension with cultural emphasis measured by oral literal and inferential comprehension questions. The model was statistically significant for the culturally less familiar (France) passage, $F(2,69)=17.33$, $p<.001$, and the more familiar (Canada) passage, $F(2,69)=7.69, p<.001$. The regression analysis further revealed that cultural word recognition less familiar contributed to approximately $27 \%$ and vocabulary (ÉVIP) $5 \%$ to comprehension questions of a culturally less familiar (France) passage. By contrast the regression analysis further revealed that vocabulary (ÉVIP) contributed to approximately $10 \%$ and cultural word recognition more familiar $7 \%$ to comprehension questions of a culturally more familiar (Canada) passage.

Table 10
Model for the Hierarchical Regression on Comprehension Questions of Culturally Less and More Familiar Passages in Grade 3 French $(n=72)$. Predictors Entered in Order: Verbal Working Memory, Second language Cultural Knowledge, Vocabulary, Morphological Awareness, Phonological Awareness, and Spelling

| Outcome and <br> Predictor | $B$ | $S E B$ | $\beta$ | $t$ | $R^{2}$ | $A d j$. <br> $R^{2} \Delta$ | $d_{j}$ | df | $F$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| CQ LF |  |  |  |  |  |  |  |  |  |
| CWR LF | 0.37 | 0.09 | .45 | $4.39 * * *$ | .28 | .27 | .71 |  |  |
| V (ÉVIP) | 0.04 | 0.02 | .25 | $2.44^{*}$ | .33 | .05 | .29 | $(2,69)$ | $17.33^{* * *}$ |
| CQ MF |  |  |  |  |  |  |  |  |  |
| V (ÉVIP) | 0.05 | 0.02 | .32 | $2.98^{* *}$ | .11 | .10 | .59 |  |  |
| CWR MF | 0.27 | 0.11 | .28 | $2.50^{*}$ | .18 | .07 | .41 | $(2,69)$ | $7.69^{* * *}$ |

Note. Abbreviations of variables signify the following in order: CQ LF (Comprehension Questions Less Familiar), CWRLF (Cultural Word Recognition Less Familiar), V (ÉVIP) (Vocabulary ÉVIP), CQ MF (Comprehension Questions More Familiar), CWR MF (Cultural Word Recognition More Familiar). *** $p<.001 .{ }^{* *} p<.01 .{ }^{*} p<.05$.

What participants comprehended when they answered orally both literal and inferential questions on a cultural less familiar passage (France) in Grade 3 will be examined first. According to Cohen (1992), given the relationship between the effect size $\left(f^{2}\right)$ and $R^{2}$ for the model with cultural word recognition less familiar and vocabulary (ÉVIP), the value of $R^{2}$ was large (.33). The effect size for the candidate model was large (.50). The relative importance of each predictor variable to the regression model as shown in Table 10 was assessed by the relative Pratt Index (Thomas et al., 1998). According to the relative Pratt index in Table 10, cultural word recognition less familiar $\left(d_{j}=.71\right)$ and vocabulary (ÉVIP) $\left(d_{j}=.29\right)$ are, in relative order, the most important predictor variables in the regression on comprehension questions less familiar
(France). Based on the principle, if $d j<1 / 2 p=.08$ ( $p$ is the number of predictor variables), all the other variables were considered unimportant. This result was also confirmed by $\Sigma \beta_{j}(1-1)=0<.08$. All other variables were removed.

By comparison, what subject comprehended when they answered orally both literal and inferential questions on a culturally more familiar passage (Canada) in Grade 3 will be examined next.

According to Cohen (1992), given the relationship between the effect size $\left(f^{2}\right)$ and $R^{2}$ for the model with vocabulary (EVIP) and cultural word recognition more familiar, the value of $R^{2}$ was medium (.18) The effect size for the candidate model was also medium (.22). The relative importance of each predictor variable to the regression model as shown in Table 10 was assessed by the relative Pratt Index (Thomas et al., 1998). According to the relative Pratt index in Table 10, vocabulary (ÉVIP) $\left(d_{j}=.59\right)$ and cultural word recognition more familiar $\left(d_{j}=.41\right)$ are, in relative order, the most important predictor variables in the regression on comprehension questions of the more familiar passage (Canada). Based on the principle, if $d j<1 / 2 p=.08$ (p is the number of predictor variables), all the other variables were considered unimportant. This result was also confirmed by $\sum \beta_{j}(1-1)=0<.08$. All other variables were removed.

Recall was used as a second measure of comprehension. Although, recall as a measure may be seen as bearing on memory rather than comprehension, Yuill (1998) defends recall as a measure of comprehension because the wording of a particular word or phrase is often crucial to maintaining the integrity of the interpretation.

### 4.1.3.3.2 Recall of Narrative Texts with Cultural Emphasis

Table 11 shows the second regression model on reading comprehension of narrative texts with cultural emphasis measured by oral recall of ideas and connections. As reported in Table 11, the regression model was statistically significant for the culturally less familiar (France)
$F(2,69)=50.78, p<.001$ and the more familiar (Canada), $F(2,69)=58.84, p<.001$ passages. The regression analysis further revealed that cultural word production less familiar contributed to approximately $59 \%$ and morphological awareness $8 \%$, to recall of ideas and connections of a culturally less familiar (France) passage. By contrast, the regression analysis further revealed that cultural word production more familiar contributed to approximately $59 \%$ and vocabulary (ÉVIP) 2\%, to recall of ideas and connections of a culturally more familiar (Canada) passage.

Table 11

Model for the Hierarchical Regression on Recall of Culturally Less and More Familiar Passages in Grade 3 French $(n=72)$. Predictors Entered in Order: Predictors Entered in Order: Verbal Working Memory, Second language Cultural Knowledge, Vocabulary, Morphological Awareness, Phonological Awareness, and Spelling

| Outcome and <br> Predictor | $B$ | $S E B$ | $\beta$ | $t$ | $R^{2}$ | Adj. <br> $R^{2} \Delta$ | $d_{j}$ | df | $F$ |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| RIC LF |  |  |  |  |  |  |  |  |  |
| CWP LF | 4.41 | 0.46 | .78 | $9.66^{* * *}$ | .59 | .59 | .87 |  |  |
| MA | 0.29 | 0.14 | .18 | $2.07^{*}$ | .70 | .08 | .13 | $(2,69)$ | $50.78^{* * *}$ |

RIC MF

| CWP MF | 3.91 | 0.39 | .76 | $10.16^{* * *}$ | .60 | .59 | .94 |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| V (ÉVIP) | 0.17 | 0.08 | .16 | $2.18^{*}$ | .62 | .02 | .06 | $(2,69)$ | $58.84^{* * *}$ |

Note. Abbreviations of variables signify the following in order: RIC LF (Recall Ideas Connections Less Familiar), CWP LF (Cultural Word Production Less Familiar), MA (Morphological Awareness), RIC MF (Recall Ideas Connections More Familiar), CWP MF (Cultural Word Production More Familiar), V (ÉVIP) (Vocabulary ÉVIP).
*** $p<.001 .{ }^{* *} p<.01 .{ }^{*} p<.05$.
What participants comprehended when they recalled a less familiar cultural passage
(France) in Grade 3 will be examined first. According to Cohen (1992), given the relationship
between the effect size $\left(f^{2}\right)$ and $R^{2}$ for the model with cultural word production less familiar and morphological awareness, the values of $R^{2}$ was large (.70). The effect size for the candidate model was also large (2.29). The relative importance of each predictor variable to the regression model as shown in Table 11 was assessed by the relative Pratt Index (Thomas et al., 1998). According to the relative Pratt index in Table 11, cultural word production less familiar ( $d_{j}=.87$ ) and morphological awareness $\left(d_{j}=.13\right)$ are, in relative order, the most important predictor variables in the regression on recall of ideas and connections of the less familiar passage (France). Based on the principle if $d_{j}<1 / 2 p=.08$ ( p is the number of predictor variables), all the other variables were considered unimportant. This result was also confirmed by $\sum \beta_{j}(1-1)=0<$ .08. All other variables were removed, including spelling although it appeared in the initial model.

By comparison, what participants comprehended when they recalled a more familiar cultural passage (Canada) in Grade 3 will be examined next.

According to Cohen (1992), given the relationship between the effect size $\left(f^{2}\right)$ and $R^{2}$ for the model with cultural word production more familiar and vocabulary (ÉVIP), the value of $R^{2}$ was extremely large (.62). The effect size for the candidate model was also large (1.65). The relative importance of each predictor variable to the regression model as shown in Table 11 was assessed by the relative Pratt Index (Thomas et al., 1998). According to the relative Pratt index in Table 11, cultural word production more familiar $\left(d_{j}=.94\right)$ and vocabulary (ÉVIP) ( $d_{j}=.06$ ) are, in relative order, the most important predictor variables in the regression on recall of ideas and connections of the more familiar passage (Canada). Based on the principle, if $d j<1 / 2 p=.08$ ( $p$ is the number of predictor variables), all the other variables were considered unimportant. This result was also confirmed by $\sum \beta_{j}(1-1)=0<.08$. All other variables were removed.

### 4.2 Qualitative Findings - Research Question 4 (Participants' Perception of and Preference in Cultural Reading Comprehension)

As part of the researcher's initial effort to draw a general profile of the participants reading comprehension perceptions of difference in cultural elements, two open-ended questions were asked. The two questions were "Quelle histoire as-tu trouvée la plus facile ? Pourquoi ? [Which story did you find easier? Why?]" and "Dans quelle histoire est-ce que tu aimerais être? Pourquoi ? [In which story would you like to be? Why?]" The two questions were designed to explore the interpretative resources Grade 3 children might have available for making sense of cultural narrative texts. Seventy-two participants were interviewed in the course of this study. The study yielded a total of four categories: two categories of easiness and two categories of preference of a cultural passage. To provide a richness of details, the category of easiness was further broken down into two subcategories, elements of narrative and language of the text and the category of preference into setting and social-interactions.

A synopsis of the qualitative interview findings of the participants reading comprehension perceptions of difference in cultural elements from the interview questions is presented in the following sections. Findings from the first interview question will be presented first, followed by findings from the second interview question.

### 4.2.1 Interview Question 1 (Story Easiness)

The first interview question was "Quelle histoire as-tu trouvée la plus facile? Pourquoi? [Which story did you find easier? Why?]". Relevant insights can be derived from the participants' utterances for finding the culturally more familiar text easier, as presented in Figure 3 and Table 12 below. Figure 3 shows the occurrences of participants' perceptions in terms of easiness of cultural passages.


Figure 3. Occurrences of participants' perceptions on easiness of cultural passages.

In terms of perceived easiness, the culturally more familiar 'story side' tallied four times as many as the less familiar 'story side'. There were fifty-eight occurrences for the more familiar against fourteen for the less familiar story. Table 12 lists the discerning themes for perceiving the culturally more familiar text easier, and displays the distribution of substantiating categories from interview data within each of the discerning themes.

Table 12
Reasons for Easiness of Culturally More Familiar over Less Familiar Passage Comprehension
Discerning Themes $\quad$ Substantiating Categories No of occurrences (\%)

|  | More Familiar | Less Familiar |
| :--- | :--- | :--- |

1. Elements of the narrative
1.1 Story structure
Fewer words
7 (9.72\%)
1 (1.40\%)
1.2 Setting
Familiar with setting
15 (20.83\%)
4 (5.60\%)
2. Language of the text
2.1 Vocabulary

Easier words
30 (41.67\%)
9 (12.50\%)

Shorter words
12 (16.67\%)
3 (4.17\%)

Knowledge/Use of words 19 (26.39\%)
4 (5.60\%)
Note. The number of occurrences takes into account participants mentioning more than one theme.
In terms of the reasons given for perceiving the more familiar passage as easier than the less familiar passage, the themes discerned from the interview data were the elements of the narrative and the language of the text.

### 4.2.1.1 Elements of the Narrative

The two sub-themes most strongly echoed in the elements of the narrative were the story structure and the setting of the story.

The story structure was characterized by the respondents in terms of the perception of the number of words in the story. In total, seven participants perceived to be fewer words in the
more familiar passage, as opposed to one participant for the less familiar passage. In one subject's words (Excerpt 1 -68G):
"Le lunch parce qu'il y a moins de mots. C'est plus facile à lire et je comprends mieux." [The lunch because there are fewer words. It is easier to read and I understand better.]

The number of words was perceived to make the text not only easier to read but also easier to understand.

The second key aspect in the elements of the narrative theme was the knowledge about and familiarity with the setting of the more familiar story. Fifteen participants stated they knew the environment where lunch recess took place in the more familiar passage, in contrast with four participants for the less familiar passage. Two participants described the setting in the more familiar story by drawing a parallel with their daily lunch recess experience (Excerpts 2 and 3 7G and 22B):
"... je suis familière avec le lunch dans la classe, parce que c'est dans classe comme ici." [...I am familiar with lunch in the classroom, because it is in the classroom like here.]
and
"... on mange comme ça dans la classe."
[...we eat like this in the classroom.]
Excerpts 2 and 3, respectively from a girl and a boy, highlight that participants were familiar with the environment of the more familiar text as they eat in a similar way in their classroom.

A number of participants also commented that they perceived the more familiar text as easier because they were familiar with the information in the more familiar environment. Rich informative details included the teacher's location and actions during lunch recess as one participant expressed (Excerpt 4 - 67B):
"Le professeur aussi mange son sandwich à son bureau et le téléphone ring. C'est pareil dans la classe."
[The teacher also eats his sandwich at his desk and the phone rings in the classroom. It is the same in the classroom.]

Another participant further echoed being familiar with the environment of the more familiar passage (Excerpt 5-40G):
"Le lunch parce que plus de les informations que tu connais." [Le lunch because more information that you know.]

The underlying feature of the statements is that the participants perceived the more familiar text to be easier to understand because the story had fewer words. Participants were also familiar with the setting, in particular the details of the environment. Familiarity with the setting, and details of the more familiar story echoed in excerpts 1 to 5 , which corroborate the significant differences of the quantitative results from section 4.1.1. As a result, participants recalled 6\% more of the supporting ideas and $12 \%$ more details of the culturally more familiar story than the less familiar story (see Table 6).

### 4.2.1.2 Language of the Text

The second theme emerging from the first interview question related to the language of the text. The sole item most strongly echoed was the vocabulary of the story. Among the reasons invoked, $41.67 \%$ of the participants perceived that the culturally more familiar passage had easier words (vs. $12.50 \%$ in the less familiar), $16.67 \%$ shorter words (vs. $4.17 \%$ in the less familiar) and $26.93 \%$ knew and used the words daily (vs. $5.60 \%$ in the less familiar).

Easier words were by far the largest of all vocabulary categories, with thirty out of seventy-two participants emphasizing its saliency. As one participant stated (Excerpt 6 - 14G):
"Le lunch parce que le lunch il y a les mots sont plus faciles."
[Le lunch because le lunch there are words are easier.]
Participants gave examples of which words they perceived as 'easier' in the more familiar passage. The words were grouped in the same two categories used on the Cultural Words Sheet, namely target words and story-theme words. In total four out of the eight target words in the more familiar passage were perceived as 'easier' as opposed to one target word in
the less familiar passage. The four target words perceived as easier in the more familiar passage were 'la cloche' [the bell], 'le lunch' [the lunch], 'le professeur' [the teacher], and 'nos casiers' [our lockers/compartments (in the coatroom)]. The reason mentioned for perceiving these target words as easier was their knowledge of the words. In the less familiar passage, the only target word perceived as easier was 'une table' [a table].

The same number of story-theme words was perceived as easier in both the more and less familiar passages. In the more familiar passage, the two most mentioned story-theme words perceived as easier were 'une banane' [a banana] and 'un biscuit' [a cookie]. In the less familiar passage, the two story-theme words perceived as easier were 'du fromage' [cheese] and 'un verre d'eau' [a glass of water]. As one participant further noted, the words were also easier to read and understand, which reinforces what participants echoed previously in the elements of narrative story structure category (Excerpt 7-26B):
"Le lunch parce qu'il y a les plus faciles mots et c'est plus facile à lire. Je comprends plus bon."
[Le lunch because there are easier words and it is easier to read. I understand more good.]

By contrast, in the less familiar passage, thirteen participants (18\%) perceived four target words as difficult: 'la sonnerie' [the bell], 'la cantine' [the dining hall], 'la cantinière' [the dining hall lady], 'notre maîtresse' [our teacher]. In addition, nine children (12.50\%) perceived three story-theme words in the less familiar passage as difficult. One participant illustrated these recurring story-theme words in his statement (Excerpt 8 - 30B):
"Le déjeuner les mots sont plus difficiles et plus confusing. Qui sont des mots comme 'chantilly', 'circulent', 'bifteck haché'."
[Le déjeuner words are more difficult and confusing. Who are the words like 'cream (puff)', 'move around', 'ground beef/steak'.]

The second vocabulary subcategory perceived as making the more familiar passage easier to read related to the length of words. Twelve participants perceived the words in the more
familiar passage to be shorter, as opposed to three participants in the less familiar passage. The variation of the wording varied as the following quotes exemplified (Excerpts 9 and $10-6 \mathrm{G}$ and 10B):
"C'était plus facile parce que les mots c'étaient plus petits."
[It was easier because the words it is smaller.]
and
"Le lunch parce que les mots sont plus courts." [Le lunch because the words are shorter.]

When participants were asked to provide specific examples of words they perceived to be shorter in the more familiar passage, they recounted one target word, 'la cloche' [the bell], and three story-theme words ' 11 h 45 ' [11:45], 'une banane' [a banana], and 'un biscuit' [a cookie]. No target or story-theme words were perceived to be shorter in the less familiar passage. On the contrary, fourteen participants perceived one specific target word 'la cantinière' [the dining hall lady], and one story-theme word '(chou) chantilly' [cream (puff)] as longer in the less familiar passage.

The last key aspect in the emergent vocabulary category was knowledge and use of words. Nineteen participants (26.38\%) stated they knew the words from the more familiar passage and used them daily. The following quotes illustrated the participants' knowledge of a variety of words from the more familiar passage (Excerpts 11 and $12-34 \mathrm{G}$ and 41B):
"Je connais plusieurs mots parce que j'ai compris plus et j'ai appris les mots comme longtemps, comme 'pupitre', 'sandwich'."
[I know several words because I understood more and I learned the words like long ago, like 'desk', 'sandwich'.]
and
"Parce que c'était les mots que je sais plus et que je use comme 'cloche', 'casier', 'boîte à lunch', 'pupitre', 'sandwich', 'banane', 'biscuit'. Dans le premier (le déjeuner), les mots c'est comme nouveau à moi."
[Because it is the words I know more and that I use like 'bell', 'compartment (in the coatroom)', 'lunch box', 'desk', 'sandwich', 'banana', 'cookie'. In the first (le déjeuner), the words it is like new to me.]

Fifteen participants (20.83\%) expressed knowing and using the following words.
Six Target Words: 'nos casiers' [our compartments (in the coatroom)], 'la cloche' [the bell], 'notre boîte à lunch' [our lunch box], 'le lunch' [lunch], 'le professeur' [the teacher] and 'son pupitre' [his desk].
and

Seven Story-Theme Words: '11h45' [11:45], 'une banane’ [a banana], 'un biscuit' [a cookie], 'son bureau' [his desk], 'deux jus' [two juices], 'mon sandwich' [my sandwich], and 'ranger' [to put aside].

Four participants stated that they did know some of the words in the less familiar passage, such as one target word 'le déjeuner' [the lunch], and one story-theme word 'du fromage' [cheese]. Eleven participants (15.27\%) highlighted that they did not know nor use four target words in the less familiar passage such as 'la cantine' [the dining hall], 'la cantinière' [the dining hall lady], 'se mettre en rang' [to line up], 'notre maîtresse' [our teacher], and 'un plateau' [a tray] as well as two story-theme words, 'un bifteck haché' [a ground beef/steak], and 'un chou chantilly' [a cream puff].

These findings show that vocabulary plays a major role in understanding a text with cultural emphasis as echoed in excerpts 6 to 12. Participants' perceptions of easiness of the more familiar cultural passage corroborate with the quantitative results from section 4.1.1. Results from Table 6 showed that differences in the less and more familiar passages for story-theme words recognition, target words production and story-theme words production, were statistically significant. As previously mentioned, when participants recalled each story, they produced (said a word in their recall) $13 \%$ more of both the cultural targeted and story theme words of the more familiar story. After reading each story, participants also recognized $25 \%$ more cultural storytheme words of the more familiar text compared to the less familiar text.

In terms of reading comprehension of narrative texts with cultural emphasis measured by answering literal and inferential questions, participants' total score on the questions was 7\% higher for the more familiar passage. Participants also inferred $15 \%$ more from the more familiar than the less familiar story. It was noted in Chapter 2 that second language learners considered vocabulary as the most important component in understanding what they read. Vocabulary has been identified as the most contributing factor to reading comprehension for both first and second language readers (Laufer, 1989, 2003). Having a large vocabulary and good comprehension can also be seen as an "indicator of good world knowledge" (Hsueh-Chao \& Nation, 2000, p. 405). World knowledge includes second language cultural knowledge (Bernhardt, 1991b).

Some differences were also found in the qualitative analysis of the patterns of connections made by individual participants as they constructed their interpretations of the text. When retelling and answering the literal questions about the culturally more familiar passage, the majority of readers used a sequence of connections to be able to state what happened at the end of the story. Participants who conformed to this pattern seemed to rely on their knowledge of the narrative genre (discourse features of narrative text: who, what, when, where) and lunch recess schema to generate a concluding statement. The ideas leading to a conclusion occurred more frequently in the retelling of the culturally more familiar passage.

Fifty-seven out of seventy-two participants also answered the literal question "What happened at the end?" and made a concluding statement when recalling the more familiar text. However, an overwhelming majority of participants, forty-two in total out of seventy-two, could not accurately provide an answer to the literal question "What happened at the end?" nor make a concluding statement when recalling the less familiar text. The gaps between connections steadily increased until the connections disappeared all together.

Statistically significant differences were found in the number of main ideas, supporting ideas and details recalled. Although children recalled more main ideas from the culturally less familiar passage, they recalled less supporting ideas and details from the less familiar passage. Connections were marked by recalling links between ideas (main ideas to the supporting ideas and/or supporting ideas to details) leading to a concluding statement through connecting words related to purpose (pour [for]) and succession (ensuite [then]), in both the culturally less and more familiar passage. When the participants answered explicit questions related to both passages, they inferred more from the more familiar than the less familiar passage. They showed a deeper understanding of the more familiar passage. Readers had the appropriate schema to comprehend the culturally more familiar text but a lack of it for the less familiar text.

### 4.2.2 Interview Question 2 (Story Preference)

The second interview question was "Dans quelle histoire est-ce que tu aimerais être? Pourquoi? [In which story would you like to be? Why?]". Relevant insights could be derived from the participants' utterances of preferring to engage in the less familiar passage, as presented in Figure 4 and Table 13 below. Figure 4 shows occurrences of participants' preference for each of the cultural passages.


Figure 4. Occurrences of participants' preferences of cultural passages.

In terms of preference, the less familiar 'story side' tallied forty-two occurrences, the more familiar 'story side' tallied thirty occurrences. Table 13 lists the discerning themes for preferring to engage in the less familiar text and displays the distribution of substantiating categories from interview data within each of the discerned themes.

Table 13
Reasons for Preference of Culturally Less Familiar over More Familiar Passage

## Comprehension

| Discerning Themes | Substantiating Categories | No of occurrences (\%) |  |
| :--- | :--- | ---: | ---: |
|  |  | Less Familiar | More Familiar |
| 1. Setting |  |  |  |
| 1.1 Curiosity | Discovery of new place | $20(27.77 \%)$ | $1(1.34 \%)$ |
| 1.2 Way of Eating | Relaxing, fun | $8(11.11 \%)$ | $5(6.94 \%)$ |
| 1.3 Duration | More time to eat | $9(12.50 \%)$ | $2(2.77 \%)$ |
| 1.4 Food | Quantity, variety and <br> perceived tastiness | $15(20.83 \%)$ | $11(15.30 \%)$ |

2. Social interactions

| 2.1 Friends | Better rapport with <br> friends, closeness, <br> sharing | $19(26.39 \%)$ | $5(6.94 \%)$ |
| :--- | :--- | ---: | ---: |
| 2.2 Teacher | More present, attentive | $6(8.33 \%)$ | $2(2.77 \%)$ |

Note. The number of occurrences takes into account participants mentioning more than one theme.
In terms of the reasons given for preferring to engage in the less familiar than the more familiar passage, the themes discerned from the interview data were the setting of the story and social interactions.

### 4.2.2.1 Setting

In relation to the setting or environment of the less familiar passage, the four sub-themes most strongly echoed were curiosity about the location to eat lunch, the way of eating, the duration of lunch and the food proposed.

Discovery was the most important aspect of engagement in the less familiar passage.

Twenty participants perceived to be more engaged in the less familiar story because they were curious about the setting, discovering a new place to eat lunch, as opposed to only one subject for the more familiar passage. Twelve out of the twenty participants stressed a curiosity about desiring to experience what it was like to eat in 'la cantine' [the dining hall] equating it with a cafeteria. They perceived 'la cantine' as being different from what they were used to, usually the classroom. The following quote exemplified this subcategory (Excerpt $13-8 B$ ):
"Le déjeuner parce qu'il y a une comme cafeteria. Parce que c'est différent, c'est un changement. Parce que j'ai pas allé à une comment tu dis le mot pour cafeteria?" [Le déjeuner because there is like a cafeteria. Because it is different, it is a change. Because I did not go to a how do you say the word for cafeteria?]

Few participants stated their preference for engaging in the more familiar story by being able to answer the phone. This highlights a cultural reference to the less familiar setting. In France, there are seldom phones in the classroom. One participant described his thoughts (Excerpt 14 -63B):
"Le lunch parce que je peux répondre à la téléphone. Le professeur a laisse le petit garçon comme moi parler sur la téléphone. J'aime répondre à la téléphone dans la classe." [Le lunch because I can answer the phone. The teacher let the little boy like me talk on the phone. I like answering the phone in the classroom.]

The second key aspect that emerged from the setting theme related to the perceived way of eating in the less familiar passage. A total of eight participants perceived that participants ate in a more relaxing and fun way during the lunch recess, in contrast with five participants for the more familiar passage. As one participant described (Excerpt 15-47G):
"C'est plus fun avec tes amis à une grande table avec cinq. Je veux manger à une grande table. Tu dois pas asseoir à ton pupitre. Pour que quand tu es dans les pupitres, ton ami n'est pas avec toi. Tu peux pas asseoir à côté de les mais quand tu as une grande table tu peux asseoir à coté de les, de tes amis. Je ne sais pas comment c'est."
[It's more fun with your friends at a big table with five. I want to eat at a big table. You don't have to seat at your desk. For that when you are in the desk, your friend is not with you. You can't seat near them but when you are at a big table you can seat near them, your friends. I don't know how it is.]

Participants also expressed that the duration of the lunch inspired them to prefer the less familiar passage. Nine participants preferred the less familiar story. Two participants preferred the more familiar story. The duration of lunch was not mentioned in any of the passages, only the time at which the bell rang for the lunch-recess. Participants perceived and inferred that lunch was longer in the less familiar passage, preferring the less familiar over the more familiar passage. This concurs with the previously mentioned participants' perception of lunch (see Excerpt 15) as being more relaxed as there is more time to eat. With a perceived longer lunch, participants said they would like to have more time to eat, to enjoy the food and not be rushed. As one participant summarized (Excerpt $16-56 \mathrm{G}$ ):
"Le déjeuner parce que je peux manger more calme. Ici on mange juste en 15 minutes. C'est plus more fun manger lent. Tu peux manger beaucoup des choses." [Le déjeuner because I can eat more calmly. Here we eat just in 15 minutes. It is more (more) fun to eat slow. You can eat a lot of things.]

Some participants preferred having less time to eat as inferred from the more familiar passage. They perceived to have more time to go outside and play. Although in the less familiar story, the characters also went outside to play after eating. Such a perception highlighted the familiar cultural background knowledge of the participants' similar daily experience in Canada. In one participant's words (Excerpt $17-23 B$ ):
'Le lunch il a plus short lunch hour pour manger. J'aime parce que tu peux aller dehors quand tu as fini de manger et aller vite pour jouer."
[Le lunch it has more short lunch hour to eat. I like because you can go outside when you are finished eating and go fast to play.]

Food provided another reason for preferring to engage in the less familiar story. The preference was expressed in different ways, from perceived quantity, variety and tastiness. As one participant validated (Excerpt 18 -12B):
'Je préfère être dans le premier pour que j'ai pas toujours la même nourriture. Tu peux commander et je veux avoir plus de nourriture. Comme le food qui est fresh."
[I prefer to be in the first (referring to the less familiar text) for that I don't have always the same food. You can order and I want to have more food. Like the food that is fresh.]

For eleven out of the fifteen participants, the culinary choices tallying the highest frequencies were story-theme words 'de la purée' [puree] - participants perceiving it as hash browns - 'un chou chantilly' [a cream puff], and 'du fromage' [cheese]. A fair number of participants stressed that the more familiar story reflected what they eat and drink everyday, e.g., a sandwich, cookies, and juice and characterized them as "I have always the same food".

The underlying feature of the statements is that the participants expressed a preference for the less familiar text because they wanted to discover what it was like to have lunch in ' $a$ cantine' [ a dining hall]. Alongside the discovery came the perception of being able to have time to eat in a more relaxed and fun way with a wider choice of food on the menu and perceived tastiness. Unfamiliarity with the setting where the menu is different daily (although cheese and pastry are a constant menu item of the daily lunch in France at school or at home) bears heavily on unfamiliar cultural schemata of the participants. The participants nevertheless expressed a desire to experience the culture.

### 4.2.2.2 Social Interactions

The second theme emerging from the second interview question related to the social interactions with friends and the teacher. The role of friends, being able to eat with a number of them (five in total) at a big table was perceived by $26.29 \%$ of the participants as an important factor in engaging with the less familiar story as opposed to $6.94 \%$ with the more familiar story. One participant captured well the preference of perceiving the importance of closeness, laughing, talking and having a good time in the less familiar story (Excerpt 19-28B):
"Le déjeuner c'est une bonne place à être. C'est amusant. Parce que quand il allait à la table, je peux rié en mangeant, ils ont rigole, ils ont de la fun."
[Le déjeuner it is a good place to be. It is fun. Because when he went at the table, I can laugh while eating, they laughed, they had fun.]

The perceived sense of 'inclusion' was opposed to a perceived sense of 'exclusion' in the more familiar story. Although the more familiar passage did not mention that students did not talk, the following quote exemplified a sense of quietness the participants associated with being alone or excluded (Excerpt 20-6G):
"Le lunch quand tu es toute seule tu peux pas parler et tu manges seul. Tu ne manges pas à la comment tu dis, cantine, juste sur ton pupitre."
[Le lunch when you are all alone you can not talk and you eat alone. You don't eat at the how do you say, 'cantine', just on your desk.]

The second social interaction subcategory associated with preferring the less familiar passage related to the role of the teacher in the passage. $8.33 \%$ of the participants perceived the teacher as having a more prominent role. The teacher was perceived as being more attentive in the less familiar story as opposed to $2.77 \%$ in the more familiar story. The following quotes, respectively by a boy and a girl illustrated this idea (Excerpts 21 and $22-28 \mathrm{~B}$ and 48G):
"... quand elle circule je peux être gentil parce qu'on va en rang à manger le lunch ..." [... when she goes through I can be nice because we stand in file to eat the lunch ...] and
"Le déjeuner parce qu'il y a une maîtresse qui amène les élèves à la cantine. C'est important de la maîtresse. Je sais pas ce que c'est."
[Le déjeuner because there is a teacher that brings the students to the cantine. It is important of the teacher. I don't know what it is.]

The last excerpt (Excerpt 22) also emphasized the sense of curiosity as previously mentioned in desiring to engage and discover more of the less familiar story setting.

Social interactions with classmates and teacher would appear to be a key aspect of why participants were more engaged with the culturally less familiar passage than with the more familiar passage. It may be that participants tested felt more engaged in a closer relationship with school friends and less excluded by the teacher in the less familiar cultural passage.

### 4.3 Synthesis of Results

Quantitative data analysis using SPSS with some exploratory qualitative analysis using NVivo were performed. Linear regression analysis was used to analyze quantitative results obtained. The exploratory qualitative analysis was done with the content analysis of interview transcripts.

Regressions analyses were used to find the percentage of explained variance of each predictor variable: (a) phonological awareness, spelling, verbal working memory, vocabulary, and morphological awareness in word reading, (b) phonological awareness, spelling, verbal working memory, vocabulary, and morphological awareness in reading comprehension of isolated sentences, and (c) phonological awareness, spelling, verbal working memory, vocabulary, morphological awareness and second language cultural knowledge in reading comprehension of narrative texts with cultural emphasis. The regression models were statistically significant in all cases. It means that the mean square of the models (MSM) is not zero. The null hypotheses should be rejected. All regression coefficients differed also from zero. The effect size for all four models were medium to large capturing the relationship and exploring the nature of association between the variables in the study. Table 14 below synthesizes the quantitative results on the regression on word reading, reading comprehension of isolated sentences and reading comprehension of narrative texts with cultural emphasis (measured by comprehension questions and recall of ideas and connections).

Table 14
Synthesis of Quantitative Results on Regressions in Grade 3 French ( $n=72$ )

| Outcome Variable | Predictor Variable | Proportion <br> of <br> Variance <br> $(\%)$ | Pratt <br> Index <br> $\left(d_{j}\right)$ | Effect <br> Size <br> $\left(f^{2}\right)$ |
| :--- | :--- | :---: | :---: | :---: |
| Word Identification (FIAT) | Phonological Awareness | 37 | .61 |  |
|  | Spelling (FIAT) | 9 | .39 | .92 |
| Reading Comprehension of | Morphological Awareness | 20 | 1.00 | .27 |
| Isolated Sentences |  |  |  |  |

Reading Comprehension of

Narrative Texts with Cultural Emphasis

Comprehension Questions

| Less Familiar Passage | Cultural Word Recognition | 27 | .71 |  |
| :--- | :--- | ---: | :--- | :--- |
|  | Vocabulary (ÉVIP) | 5 | .29 | .50 |
| More familiar Passage | Vocabulary (ÉVIP) | 10 | .59 |  |
|  | Cultural Word Recognition | 5 | .41 | .22 |

Recall of Ideas and Connections

Less Familiar Passage Cultural Word Production 59 . 87
Morphological Awareness 8 . 13.29
More familiar Passage Cultural Word Production 59 . 94
$\begin{array}{llll}\text { Vocabulary (ÉVIP) } & 2 & .06 & 1.65\end{array}$
Note. The relative Pratt index $d_{j i}$ is used for ordering the importance of predictor variables. The effect size $f^{2}$ represents the effect size for the candidate model.

Participants read faster and recalled more of the material dealing with the more familiar culture and tended to distort the information from the less familiar culture. The cultural origin of a text and having second language cultural knowledge lead students to achieve a more detailed reading comprehension of the culturally more familiar passage. It was also found that culturespecific vocabulary and morphological awareness were important to the comprehension of cultural passages.

The exploratory qualitative findings corroborated some of the quantitative results. Interviews revealed that participants perceived the culturally more familiar passage as easier pointing to familiarity with culture-specific vocabulary and the setting of the story. By contrast, participants perceived the less familiar cultural passage as more engaging based on their curiosity upon discovering the lunch setting. They also felt more engaged in a closer relationship with school friends and less excluded by the teacher in the less familiar cultural passage.

## CHAPTER 5: DISCUSSION

The ability to read fluently and comprehend adequately is considered a hallmark of skilled reading in first and second languages (Grabe, 2002; Koda, 2005). Reading comprehension is central to French immersion schooling. The steady increase in early French immersion enrolment combined with a high transfer rate out of the programme because of reading difficulties make predictors of French as a second language reading comprehension of prime importance. Identifying the concurrent predictors of French reading comprehension gives us a rationale to guide second language teachers on how to provide students the support needed to achieve academic success. This focused support would give students the abilities needed to succeed in French immersion and eventually encourage them to remain in the French immersion programme.

To be able to learn the content subject courses taught in French, French immersion students needed to understand what they read. It is expected that students in those programs are able to deal with narrative or expository texts in French in a daily manner. A narrative text includes such elements as theme, plot, conflict(s), resolution, characters and setting. Expository texts, on the other hand, are written to convey, describe or explain non-fictional information. The narrative text uses story to inform and distract. The expository text uses facts and details, opinions and examples to do the same. French immersion students need to understand both types of material, though "the development of fluent reading abilities by second language students is a challenging undertaking" (Carrell \& Grabe, 2002, p. 235). Fluent reading deserves a detailed analysis by teachers and administrators of French immersion programmes who take their students' academic progress and success seriously.

The present research was conducted in an effort to examine and identify the predictors of reading comprehension among French immersion Grade 3 students in British Columbia, Canada. Reading is defined as a highly complex, interactive and compensatory process in this research. The meaning and interaction between the linguistic and cultural characteristics of the text depend to a measurable extent on the reader's existing second language cultural knowledge. The current research is focused on word reading and reading comprehension with various predictors such as phonological awareness, spelling, verbal working memory, morphological awareness, vocabulary and second language cultural knowledge.

Having examined the quantitative results and the qualitative interview findings of this study, it is important to contextualize both and reflect on the theoretical, pedagogical and programme development implications of this study. In this chapter the quantitative results and the qualitative interview findings are considered in light of the compensatory model of second language reading (Bernhardt, 2005). A summary of the main quantitative results and qualitative interview findings of the present study will be presented. The quantitative results and the qualitative interview findings will also be discussed in the context of the existing research literature on second language students' reading comprehension described in Chapter 2. The theoretical, pedagogical and programme development implications will also be addressed.

### 5.1 Summary of Results

The first research question addressed the role of phonological awareness, spelling, verbal working memory, vocabulary and morphological awareness in word reading. Results from the quantitative analysis established that phonological awareness and spelling predicted word reading.

The second research question addressed the role of the same predictors mentioned above in reading comprehension of isolated sentences (Khomsi, 1999). Results from the quantitative
analysis showed that morphological awareness predicted reading comprehension of isolated sentences.

The third research question investigated predictors of reading comprehension of narrative texts with cultural emphasis. The results showed that second language cultural knowledge, vocabulary and morphological awareness were important for comprehending a text with a cultural emphasis. The more familiar text (Canada) was read faster than the less familiar text (France). Readers recalled more, and made more appropriate elaborations on the more familiar text than on the less familiar text. Participants recalled more supporting ideas and details in the passage that was culturally more familiar. However, participants recalled more of the main ideas of the less familiar text than of the more familiar text. When participants were asked to recall each story, they remembered more of the cultural targeted and story-theme words from the more familiar story than the less familiar story. In terms of reading comprehension of narrative texts with cultural emphasis measured by answering literal and inferential questions, the total score on the questions was higher for the more familiar passage than for the less familiar passage. Participants inferred more from the more familiar than the less familiar story as well.

Findings from the interview relating to the fourth research question indicated that participants perceived the more familiar passage as easier. They perceived that the more familiar passage had less words, easier words and shorter words. Participants acknowledged having a better knowledge of words and were more familiar with the setting. Participants also perceived the less familiar cultural passage as more engaging. Their perception was based on their curiosity upon discovering the lunch setting, the way of eating, the duration of lunch, and the quantity, choice and tastiness of food items in France. Participants felt that the characters in the stories were more engaged in a closer relationship with school friends and less excluded by the teacher in the less familiar cultural passage than in the Canadian setting.

### 5.2 Discussion

The present study was intended to investigate the predictors of word reading and reading comprehension of Grade 3 French immersion students. The study was also intended to investigate what the students perceived as different in the culturally less and more familiar text that affected their reading comprehension as well as which cultural context they preferred and why. This section will interpret the data by "transcending factual data and cautious analysis and probing into what is to be made of them" (Vakalisa, 1995, p. 1266). Based on the findings of the present study, the role of lower level skills (phonological awareness and spelling) in word reading, the role of higher-level skills (morphological awareness and vocabulary) in reading comprehension, and the importance of second language cultural knowledge and engagement in reading comprehension with cultural emphasis will be discussed.

### 5.2.1 The Role of Lower Level Skills in Word Reading

The first question in this study concerned the best predictors of word reading among phonological awareness, verbal working memory, spelling, vocabulary, and morphological awareness in Grade 3 French immersion students.

The results from regression analyses revealed in third grade that phonological awareness and spelling predicted early reading skills. The results of this study correspond to and reinforce previous findings found in first language and second language contexts as well as in French immersion educational settings.

Phonological awareness was the strongest predictor compared to spelling and accounted for a substantial proportion of the variance (37\%) in French word reading ability. The results confirm that French immersion Grade 3 students rely heavily on 'breaking the code', which is highly related to phonological awareness. French immersion Grade 3 students use the phonological knowledge in order to read words, leading to a phonological-based decoding that
could be automated. The present study did not differentiate phonemic or syllabic awareness within phonological awareness as previous French immersion studies did (Bruck \& Genesee, 1995; Bruck et al., 1997; Rubin \& Turner, 1989; Tingley et al., 2004). It blended phonemic and syllabic tasks under the umbrella of phonological awareness.

The findings of the present study show that phonological awareness predicts early reading skills and confirm previous results from other studies in the French immersion context that also blended phonemic and syllabic tasks (Comeau et al., 1999; Cormier \& Kelson, 2000; Lafrance \& Gottardo, 2005; Tingley et al., 2004). As a reader grasps the principles of phonology, his/her decoding improves. This suggests that the more phonological awareness training students receive in early years, the more gain could be expected to be made in word reading. Measures of phonological awareness can be of use in screening students with regard to reading readiness. Spelling also contributes to word reading in French in Grade 3 French immersion students but in weaker terms ( $9 \%$ of the variance). This finding is consistent with previous research indicating that spelling plays an important role in word reading and reading comprehension in a second language context (Lesaux et al., 2007).

The role that phonological awareness and spelling play in word reading in French immersion students would suggest that French immersion students probably use their knowledge of phonology to spell words and in turn to decode the words they read. Ehri $(1995,1996,1998)$ argues in her developmental model that children go through different phases. French immersion readers in this study recognized words on the basis of visual characteristics and reading through phonological recoding. It appears that the French immersion reader had at his/her disposal the alphabetic process and internalized the classifications of sounds that are embodied in the French conventional writing system (Treiman \& Bourassa, 2000). This result also corresponds to

Bernhardt's (2005) compensatory model of second language reading - first dimension, especially the contribution of the sound/symbol correspondences ('Beliefs about words') to word reading.

The results suggest that phonological awareness and spelling are important for French immersion students in word reading. By comparison, phonological awareness and spelling did not predict reading comprehension. A secondary goal of the present study was to investigate whether reading comprehension relies on the same or different predictors than word reading in student's literacy acquisition. However, the skills important for decoding are different from the ones important for comprehension. The findings of the present study suggest that phonological awareness is a lower level skill that contributes to decoding. Morphological awareness and vocabulary are higher level skills that contribute to reading comprehension.

### 5.2.2 The Role of Higher Level Skills in Reading Comprehension

The role of phonological awareness, verbal working memory, spelling, vocabulary and morphological awareness in the predicting of reading comprehension in Grade 3 French immersion students was examined in the present study. The role of morphological awareness, vocabulary and second language cultural knowledge on reading comprehension in the present study will be discussed. The plausible reason why verbal working memory did not emerge as a predictor of reading comprehension of isolated sentences will also be addressed.

Khomsi's (1999) test was used to measure reading comprehension of isolated sentences in the present study. Two narrative texts were also used to measure reading comprehension with cultural emphasis. Morphological awareness was most strongly related to reading comprehension of isolated sentences in French measured by Khomsi (1999) in the present study. It explained $20 \%$ of the variance. Morphological awareness also played a role in the recall protocol of the culturally less familiar passage. It accounted for $8 \%$ of the variance. These results are in line with French monolingual (Casalis \& Louis-Alexandre, 2000; Plaza \& Cohen, 2003) and second
language learners (Bindman, 2004; Deacon et al., 2007; Droop \& Verhoeven, 1998b; Wang et al., 2006) studies. It should be noted that syntax and morphological knowledge measures were combined in the Bindman (2004) and Droop and Verhoeven (1998b) studies.

The results of the present study suggest that the higher order process, morphology, is important in French reading comprehension. This result supports Bialystok's (1988) view on the relationship between morphological awareness and reading comprehension. According to Bialystok's (1988), increasing reading comprehension would depend on the readers' ability to detect, extract, or articulate some structural property of language. The structural property of language includes awareness of morphology or concept of word, which draw primarily on a reader's knowledge of linguistic structure. Furthermore, according to Geva's et al. (1997) second language proficiency based hypothesis, higher order processes such as morphology may be important in French because French is highly inflected. Inflection is the way language modifies word forms to handle grammatical relations such as tense conjugation, person and number. French has more inflection than English for example, especially in verb conjugation. A single morpheme usually carries information about person, number, tense, aspect and mood. Adjectives, nouns and articles are considerably less inflected, but they still have different forms according to number and grammatical gender. Therefore, this could also explain why morphological awareness is important in French reading comprehension.

In addition, the measure of morphological awareness used was not a pure measure of morphological awareness. It also measured reading skills. It probably also measured reading comprehension because many of the morphological facets measured are entangled with semantic contrasts (e.g., singularity vs. plurality; action occurring in the past, present or future). The link between morphological awareness and higher-order processes needs to be qualified as morphological awareness was strongly correlated with spelling (.62). Indeed, as French is a
highly inflected language, many sublexical markers (e.g., plural markers, gender markers, and tense markers) are important in reading comprehension.

Finally, reading comprehension in French in the present study was assessed using l'Épreuve d'évaluation de la compétence en lecture - Révisée (LMC-R), Compréhension en lecture (Khomsi, 1999). As this test is designed to detect students with reading difficulties, the oral sight-reading of sentences matching it with the appropriate picture among four choices, drew on the morphological structure.

In the reading comprehension of isolated sentences task, vocabulary was also needed to a lesser extent than morphological awareness because the participants had pictures all related to the topic of the sentence read. This gave the participants support for any vocabulary they may have not known. The reading comprehension of isolated sentences task may have required readers to be aware of the internal morphology of sentences, which allowed them to understand with accuracy the meaning of the sentences being read in order to point to the right picture. French immersion students need to develop enhanced awareness and control of morphological structures of the French language to increase their reading comprehension. Some comprehension difficulties, which are often observed in French immersion students, could be due to a lack of morphological awareness or impairment in the ability to use morphological awareness in a productive way. The similarity in methodology between the reading comprehension of isolated sentences and morphological awareness tasks might be an alternative explanation for the high correlation and independent contribution of morphological awareness to the reading comprehension of isolated sentences measure.

It is important to note that some of the relationships between French reading-related abilities and French reading may have been driven by strong correlations. As posited by Ehri (1995, 1996, 1998), in the fourth stage 'consolidated alphabetic' larger spelling units (onset-
rhyme) but also morphemic units (roots) are used to recognize words as wholes. Specific language features such as morphological complexity and depth of lexical familiarity may interact with more global second language proficiency effects in the development of second language reading skills (Geva et al., 1997). Vocabulary development may also have an impact on the transfer of morphological knowledge in a second language. Thus, the magnitude of the relationships uncovered in the present study to reading requires further study.

The research data analyzed in the present study suggests that morphological awareness does play a role in the literacy of French immersion students. Morphological deficiency would be a major impediment to comprehending texts for French immersion students. Knowledge of the morphology may help facilitate the parsing of sentences. It may also lead to more effective processing of ambiguities and resolution of breakdowns in comprehension which in turn may lead to speedier text comprehension (Carlisle et al., 1999; Leong, 1984).

Reading comprehension of narrative texts with cultural emphasis required a higher skill level of semantics. Reading comprehension of narrative texts with cultural emphasis was measured using comprehension questions (literal and inferential) and recall of ideas and connections of both a culturally less familiar narrative passage (taking place in France) and a more familiar narrative passage (taking place in Canada).

Results from regression analyses showed that oral receptive vocabulary ${ }^{14}$ was a more important predictor in reading comprehension of a culturally more familiar than a less familiar text. When reading comprehension was measured using literal and inferential comprehension questions, oral receptive vocabulary (ÉVIP) accounted for $10 \%$ of the variance in the more familiar passage and for $5 \%$ in the less familiar passage.

[^13]It is not surprising that vocabulary emerges as an important predictor of reading comprehension of narrative texts with cultural emphasis. This finding is concurrent with that of Alderson (2000). Alderson (2000) noted that higher level skills, such as lexical skills (vocabulary) is important to comprehension. Results of the present study also confirmed that vocabulary is important in reading comprehension of narrative texts with cultural emphasis (Campbell, 1981; Droop \& Verhoeven, 1998a; Garcia, 1991; Jiménez et al., 1995, 1996). In Garcia's (1991) study with English second language elementary students, English general vocabulary was the major factor that adversely affected the Spanish students' reading test performance in English. The relationships between vocabulary knowledge and reading comprehension are complex and dynamic. When second language learners come to a word they cannot understand in a sentence, they can use other clues to arrive at an understanding (Tunmer et al., 1987). These clues include knowledge of the meaning of the sentences as well as knowledge of the morphology, which is an aspect of grammatical form in Bernhardt's (2005) compensatory model of second language reading. This contextual facilitation contributes to the reader's vocabulary acquisition and may result in an overall improvement in reading skills.

Contrary to other studies in English, French or French immersion, verbal working memory did not predict reading comprehension in the present study. The type of task that was administered could explain this result. In a previous French immersion study, verbal working memory was measured by sentence repetition in Grade 3 students and predicted reading comprehension (measured by Curriculum Based Assessment Reading Comprehension), by contributing 3\% of the variance (Bournot-Trites \& Denizot, 2005a). In the present study, verbal working memory was measured by a number task (Digit Span). Such a task prevented vocabulary and syntactic demands to be confounded with verbal working memory in the assigned exercise. This explanation is corroborated by the findings of a recent study by Lesaux et
al. (2006) with English as a second language Grade 4 students. The Lesaux et al. (2006) study found that verbal working memory for numbers also failed to predict reading comprehension. The Lesaux et al. (2006) study would seem to indicate that verbal working memory is a complex skill. This area of language research needs further study to determine in what ways and why different measures play a role in reading comprehension.

Reading comprehension requires the higher levels skills of morphological awareness and vocabulary. Vocabulary is even more important when reading text with cultural emphasis. Reading requires proper sampling and integration of information (graphemic to decode and morphology to comprehend) and semantic (lexical) information. That is the interplay of morphology and vocabulary in text processing. Morphological awareness and vocabulary knowledge do play an important role in second language reading comprehension and are part of Bernhardt's (2005) compensatory model of second language reading - second dimension second language knowledge.

When reading texts with cultural emphasis, French immersion Grade 3 students may be able to integrate information across the text when they have well-developed corresponding second language cultural knowledge as discussed in the next section.

### 5.2.3 The Role of Second Language Cultural Knowledge in Reading

 ComprehensionThe study also addressed the relative role of second language cultural knowledge as a predictor of reading comprehension in a more or less culturally familiar narrative text, as compared to phonological awareness, verbal working memory, spelling, vocabulary and morphological awareness in Grade 3 French immersion students. Reading comprehension of narrative texts with cultural emphasis was measured using comprehension questions (literal and
inferential) and recall of ideas and connections of both a culturally less familiar narrative passage (taking place in France) and a more familiar narrative passage (taking place in Canada).

The quantitative results from the recall protocols and comprehension questions as well as the findings of the exploratory qualitative interview data showed clearly that second language cultural knowledge affects the processing and comprehension of text of Grade 3 French immersion students. In the present study, second language cultural knowledge was important to reading comprehension of narrative text with cultural emphasis. The correct answers to the comprehension questions and amount of information recalled differed according to whether participants were reading the culturally more familiar or less familiar passage.

Results from regression analyses showed that cultural receptive vocabulary ${ }^{15}$ was the most important predictor for the culturally less familiar text. It predicted comprehension questions accounting for $27 \%$ of the variance. Cultural oral productive vocabulary predicted recall of ideas and connections accounting for $59 \%$ of the variance. Cultural oral productive vocabulary was also an important predictor of the more familiar passage when reading comprehension was measured using oral recall protocol of ideas and connections accounting for $59 \%$ of the variance. However, cultural receptive vocabulary accounted only for $7 \%$ of the variance in the comprehension questions of the more familiar passage.

Being able to recognize and produce cultural terms, such as target and story-theme words, probably helped readers activate appropriate second language cultural knowledge more efficiently. When counting the target words in the participants' responses when they recalled each passage, the participants significantly said more target and story-theme words in the culturally more familiar text. Participants also recognized more story-theme words in the more

[^14]familiar passage on the Cultural Word Sheet than the culturally less familiar text. This recognition factor was significant in the texts examined.

A striking example concerned the concept of the bell ringing. In the more familiar text, the sentence was 'the bell rings' and in the less familiar text 'we hear the bell'. The word 'sonnerie' was used for the word 'bell' in the less familiar text. The word 'cloche' was used for the word 'bell' in the more familiar text. Only nine participants recalled that the bell rang in the less familiar text as opposed to thirty-three participants in the more familiar text. This may be explained by the use of the target word 'la sonnerie' used in France as opposed to the word 'la cloche' in their Canadian context.

The study also addressed whether students perceived a difference of cultural elements in the less and more familiar text that affected their reading comprehension. The interview data about this question indicated that readers perceived those same words from the culturally more familiar passage as easier. The interview data suggest that the understanding of these key terms contributed to the participants more successful overall performance. By contrast, participants tended not to recall cultural unfamiliar terms in the less familiar passage. They did not understand their meaning perceiving them as 'difficult and long' (e.g., 'bifteck hache' [ground beef], 'chou chantilly' [cream puff], 'circulent' [move around] as expressed in section 4.2.1.2 Language of the Text). These words affected the participants' comprehension of the less cultural familiar passage.

These results are very interesting as the word frequencies were similar for the two measures. Participants should have been familiar with many of the culture-specific words in the story about France. Participants themselves appeared to note that they were not familiar with many of the words in the story about France as discussed in section 5.2.2. The culturally less familiar story should not have been linguistically less familiar for the participants. It may be the
case that participants lacked the relevant second language cultural knowledge and vocabulary required for the less familiar text.

The themes discerned from the qualitative analysis of the interview data provided evidence that participants were able to integrate their local understandings more quickly when reading the culturally more familiar passage than the less familiar passage. These findings suggest that having the relevant cultural schemata for a reading passage facilitates the reading process. The following excerpt from one particpant's response illustrates this point exactly (Excerpt 21-7B):
"Le lunch parce que c'est dans la classe et je suis familière avec les choses de la classe pendant le lunch. Je comprends bon."
[The lunch because it is in the classroom and I am more familiar with the things in the classroom during the lunch. I understand good.]

Consistent with schema theory are the findings that participants made more elaborations, or culturally appropriate extensions of the text, when reading the culturally more familiar text. For instance, the culturally more familiar passage stated that "... vers nos casiers au fond de la classe pour aller chercher notre boîte à lunch" - [... to the coatroom at the back of the classroom to get our lunch box]. Participants made inferences about the graphic descriptions of the lunch box and about getting their coats from the coatroom. Both are important factors in the more familiar school culture. The culturally more familiar passage also stated "Le téléphone de la classe sonne ..." - [The classroom phone rings ...]. Although this was the only time the phone was mentioned, some responses made reference to the number of times the phone rang.

One possible explanation for this finding lies in the different cultural roles and responsibilities children might have in the classroom. Answering a telephone call being an example. Whatever the specific tasks, characters in the culturally more familiar passage appear to be more 'active' (answering the phone, getting their lunch box, getting their lunch out of their
lunch box, perceiving to eat faster so they can go and play, etc.). Characters in the less familiar passage on the other hand may be perceived more as 'passive'. Passivity may be perceived because the characters in the more familiar story were led by the teacher to go to the 'cantine', were given the food, were perceived as taking more time to eat and were supervised by the teacher while eating.

By way of contrast, when reading culturally less familiar material participants relied more heavily on accepting ambiguity (cantine vs. cafeteria). They concentrated on getting the main ideas of the passage rather than the details. This does not necessarily imply superficial reading. Participants may have left aside supporting ideas and details because they encountered difficulty in relating stimulus sentences to other portions of the text or to their second language cultural knowledge. The recall results also suggest that these differences in understanding what participants read may have been related to differences in the comprehension of text. As predicted by schema theory, readers who possessed accurate cultural content knowledge directly relating to the material they were reading comprehended that material more effectively than readers who lacked such schemata. Significantly more supporting and detailed ideas were recalled from the culturally more familiar than from the culturally less familiar passage.

The number of cultural omissions that surfaced in the participants' retellings of the culturally less familiar text also supports the importance of schemata in text comprehension. It involved "outright omissions from one's own culture" (Steffensen et al., 1979, p. 15). For example, the retellings of the culturally less familiar passage contained very few references to the following supporting ideas that are different than in the Canadian culture:
'on sort de la classe' [we go out of the classroom (to the cantine)], 'les maîtresses circulent entre les tables' [the teachers move around the tables], 'après le déjeuner, on se remet en rang' [after lunch we go back in a file/line].
and the following detailed ideas:
'tout le monde se lève' [everyone stands up], 'sans faire de bruit' [without making noise], 'en entrant, nous prenons un plateau, une assiette ...' [going in, we take a tray, a plate], '... des carottes râpées, de la purée, un bifteck haché sur mon assiette ... et je prends un chou chantilly' [... grated carrots, purée, a ground beef steak on my plate... and I take a cream puff].

The participants' familiarity with the more familiar story seemed to provide 'ideational scaffolding' (Anderson et al., 1977) for selected categories of ideas in the stories while reading. Presumably, there is a slot established in the schema for which supporting and detailed ideas in 'Le lunch' are leading candidate ideas by the time the specific phrases are encountered. Evidence for encoding or retrieving information lies in the fact that a schema operative when a passage is read affects encoding, possibly by directing attention to text elements that are significant in the light of the schema (Anderson \& Pearson, 1984). The schema affects remembering, in part providing the plan for searching the memory. The schema also provides a basis for inferential elaboration when a passage is read and for inferential reconstruction when there are gaps and inconsistencies. Lack of second language culturally determined knowledge seemed to affect recall of propositions from the culturally less familiar story.

The schema for 'Le déjeuner' was either nonexistent or culturally biased. Passages in this story were ambiguous to the participants because of the lack of knowledge of the language and the lack of schema for the cultural situation in the story. The qualitative analysis of the interviews also highlights the influence of the participants' native school culture. This influence was clearly evident in the participants' perception of easiness associated with being able to recall significantly more elaborations and details of the culturally more familiar passage. These findings suggest that differences in cultural schemata are a significant source of differences in comprehension processing of a culturally more and less familiar narrative text.

In her compensatory model of second language reading, Bernhardt (2005) identified a dimension not yet explained in reading comprehension, of which 'engagement'. Additional
insights from the exploratory qualitative findings suggest that engaged reading is strategic. "Engaged reading is strategic and conceptual as well as motivated and intentional" (Guthrie, Wigfield, Barbosa, Perencevich, Taboada, Davis, Scafiddi, \& Tonks, 2004, p. 404). When readers are intrinsically motivated, they are reading for something they really want to know about. Readers would like to recognize words as they relate to the comprehension of the text.

The data collected in the present study suggest participants perceived to be more engaged with the less familiar passage. The more participants would recognize words, the more they would comprehend the text and the more they would be involved in the story and intrinsically motivated to read it. It would follow that readers would recall more information and achieve a greater integration of text information with their knowledge (Kintsch, Kozminsky, Streby, McKoon, \& Keenan, 1975; Kintsch \& van Dijk, 1978). The quantitative results and qualitative interview findings further suggest that the less readers are familiar with a cultural passage, the less they understand because of a lack of second language cultural knowledge. Overall comprehension is also relating and integrating new information with the second language cultural knowledge and effectively utilizing, confirming and integrating strategies to construct meaning and text.

Participants also used their cultural knowledge and the situational context as well as linguistic strategies such as vocabulary and morphology to construct an interpretation of the meaning of a text. When reading the culturally more familiar passage, vocabulary and second language cultural knowledge provided the basis for a better understanding compared to the culturally less familiar passage. Morphological awareness was also related to the reading comprehension of the culturally less familiar passage. For the less familiar passage, participants used morphological knowledge to comprehend the text.

It would appear that when a narrative text is culturally more familiar, the participants used the general vocabulary (ÉVIP) to understand what they were reading and did not need to compensate with morphological awareness. When reading a less culturally familiar narrative text, the participants compensated the unknown vocabulary and part of the missing cultural schemata with morphological awareness to understand what they were reading. The role of cultural knowledge was also crucial for comprehending written discourse. Knowing the second language cultural content enabled a reader to differentiate information in a text. When appropriate schemata are available, readers may differently allocate cognitive resources to what they perceive as important. The schema representing a reader's cultural knowledge about the content of culturally more familiar materials appeared to facilitate and to enable him/her to develop a unified meaning of the text. The unified meaning implied connecting ideas together from the main ideas to the details. When reading culturally less familiar materials, participants lacked the relevant cultural knowledge, resulting in fewer connections and greater ambiguity. In the present study, participants appeared to abandon the search for a detailed understanding and compensated with morphology to understand the text at hand. Participants also tended to be less successful in their comprehension of the text.

The research reported here adds to the current second language knowledge and corresponds to existing theoretical framework of second language reading. It shows that reading is an interactive process. The nature of this process and its ultimate success depends on a variety of factors. The underlying skills, phonological awareness and spelling processing are strongly related to word reading in French. The quantitative results and qualitative interview findings of this study indicate that three of the most important factors in reading comprehension are morphology, vocabulary and the second language cultural knowledge of the reader.

It seems that French immersion Grade 3 students in the present study drew on skills that had been thought of being "higher level" (Ehri, 1999). The findings of the present study suggest that French immersion Grade 3 students used French morphological information for understanding a French text more effectively. Morphology and vocabulary knowledge which are part of Bernhardt's (2005) second dimension - second language knowledge - played an important role. Morphological awareness covered different parts of the speech such as nouns, verbs, adjectives, prepositions, conjunctions and punctuation. Morphological awareness at least measured by cloze sentences appeared to be important. Readers also used semantic information to comprehend texts with cultural emphasis.

Elements such as content and domain knowledge (which includes second language cultural knowledge) and to a lesser extent engagement correspond to Bernhardt's (2005) third dimension - hypothetical variables. The findings of the present study further suggest that when reading texts with cultural emphasis second language cultural knowledge was also crucial for comprehending written discourse. Participants recalled more information and achieved a greater integration of text information when given culturally familiar text material. The contribution of the present study in French supports a compensatory reading model of French immersion Grade 3 students. This model is presented next.

### 5.3 Compensatory Model of Predictors of Second Language Reading

Figure 5 below shows the compensatory model of second language reading resulting from this study.

Second language literacy knowledge


Second language knowledge dimension


Figure 5. Compensatory model of predictors of second language reading.
Note. The number in front of the predictors indicates their role in order of importance as predictors of the dependent variables.

The main contribution is that this research demonstrated a compensatory effect between the variables used to predict reading comprehension in French as a second language in the French immersion context. As shown in Figure 5, for the three reading comprehension tasks, three predictors appeared in one or several of them. These were morphological awareness, receptive vocabulary and second language cultural knowledge.

From the above model, it is interesting to note that the role of predictors is different in different reading comprehension tasks. When reading comprehension with more familiar cultural emphasis was tested with a narrative text, general receptive vocabulary (ÉVIP) was the main predictor of reading comprehension. When reading comprehension with less familiar cultural emphasis was tested with a narrative text, second language cultural knowledge (measured by cultural receptive vocabulary), general receptive vocabulary (ÉVIP) and morphological awareness predicted reading comprehension. When reading comprehension was tested with isolated sentences with pictorial support, morphological awareness emerged as the single predictor of reading comprehension. It seems that depending on the reading comprehension task at hand and the readers' background knowledge (linguistic or content), readers use different tools at their disposition to understand what they read. In that way, the model described above is compensatory.

For example, when a narrative text was culturally more familiar, the participants used the general vocabulary (ÉVIP) to understand what they were reading and did not need to compensate with morphological awareness. But, when reading a less culturally familiar narrative text, the participants may have compensated the unknown vocabulary and part of the missing cultural schemata with morphological awareness to understand what they were reading. When participants read isolated sentences with pictorial support, they did not need to know as much vocabulary due to the support given to them by the picture. Schemata were also not crucial to understand isolated sentences on very general topics. Therefore, participants relied more on morphological awareness to understand what they read with accuracy to choose among the four pictures related to the same theme. Indeed, the test was more about accuracy since each picture and sentence were about the same topic with some subtle differences that could only be understood with the support of morphological awareness.

It seems that depending on the reading comprehension task at hand and the readers' knowledge (linguistic or content), readers use different tools at their disposition to understand what they read. As found in first and second language, vocabulary is very important. However, this research shows that morphological awareness and second language cultural knowledge are also very important. Indeed, morphological awareness takes more importance when context is missing or limited. These three variables compensate with each other. In that way, the model described above is compensatory and interactive. In view of the discussions and model above, implications for French immersion policy and practice are suggested from the results of this study in the following section.

### 5.4 Implications: Turning the Tide

Several theoretical, pedagogical and programme development implications can be drawn from the present research. Developing reading skills in French immersion should help Grade 3 students notice phonemes and spelling when decoding words. The development of reading comprehension through morphological awareness and vocabulary including lexical choices and the selection of reading materials, which enhance and broaden francophone cultural background knowledge must be addressed.

### 5.4.1 Theoretical Implications

The present study provides empirical support for the compensatory model of second language reading in French immersion as described before. The pattern of results from this study also contributes to current theoretical discussions.

During the initial stages of literacy acquisition, word reading seems to be the product of phonological awareness and spelling. In Gough, Juel and Griffith (1992), to break the 'cipher', children have to understand the rule-governed relationships between letters in words' spelling patterns and the phonemes for which they stand. As reading skill develops, the child can be
thought of as abstracting more and more sophisticated, but implicit, rules about the relationships between print and sound. To support effective generalization to new words, the mappings need to operate at the level of graphemes and phonemes. The process of learning to read an alphabetic script (as French in the present study) involves the creation of mappings between graphemic and phonological representations. Viewed in this way it seems natural to expect phonological awareness to be an important predictor or early reading skills.

The present research identified which variables are reliable precursors of reading comprehension skills including morphological skills. Although a significant body of data is available on letter knowledge and word decoding skills, less is known on the role of morphological skills. The present research has determined that morphological awareness is also a predictor of reading comprehension skills. The inclusion of morphological awareness is useful, particularly given the potential overlap between knowledge of patterns and of morphology. It may be the case that higher order processes, such as morphology, are more important in French because the French language is highly inflected.

Comprehension can be said to be a product of a higher-level skill set when reading a second language cultural text. These skills include semantics, second language cultural knowledge and to a lesser extent morphological processing. The combined influence of these factors appears to be strong. These skill indicators will require further investigation to identify if the importance of each varies according to the level of literacy development in French immersion students and the types of texts they read.

The results and findings of the present study are further cause to consider the effects of instructional context. Pedagogical implications emanating from the results and findings of this research will be explored in the next section.

### 5.4.2 Pedagogical Implications

If French is not spoken in the home, reading acquisition and language development relies very heavily on classroom instruction. In some cases parents teach reading in English to their children before they come to school. The skills acquired by those children in one language are transferred to the second language. Cases such as these are not common.

The results of this study have a number of practical implications. They suggest that teachers could help their students' reading development by helping them notice phonemes when decoding, by making them aware of grammar in particular morphology through a counterbalanced approach (Lyster, 2007) and by expanding their vocabulary. The present study also indicates that instructional practices bridging the cultural knowledge gap between the native culture of the readers and the culture of the second language could improve the reading comprehension of texts taken with a francophone cultural emphasis. This could be done by expanding lexical knowledge and second language cultural knowledge in French immersion students. Readers could make relations between the francophone schematic knowledge and text information. The pedagogical implications in regards to phonological awareness, morphological awareness, vocabulary and second language cultural knowledge development will be discussed next.

### 5.4.2.1 Development of French Phonological Skills

The present study indicates that a strong emphasis on a balanced approach to early literacy development, which includes teaching of French phonemes and spelling in the primary grades seems important to success in any French immersion programme. Findings from intervention studies in English first language (Castiglioni-Spalten \& Ehri, 2003; Ehri et al., 2001; Elbro \& Petersen, 2004; Lundberg et al., 1988) and French immersion (Bournot-Trites, 2005) suggest that second language reading skills can be significantly improved with targeted phonics
instruction in the primary grades. Intervention studies at the Kindergarten and Grade 1 level for students identified as 'at-risk' ${ }^{16}$ of word reading have demonstrated the efficacy of instruction in phonological skills on reading acquisition (Bradley \& Bryant, 1983b; Lundberg et al., 1988). These 'at-risk' students improved their performance with phonological awareness and phonics instruction. Teachers could formulate more suitable techniques to read for decoding such as using La méthode phonique (Molzan \& Lloyd, 2001). La méthode phonique puts the emphasis on phonics, graphemes, spelling or games (Sones, Goulet, \& Christen, 2007; Webster, Deuling, \& Frizzell, 2000). The training of phonological awareness skills in French should therefore be encouraged for French immersion students as soon as Kindergarten. The results also showed the important role of morphological awareness skills in literacy. Another pedagogical implication is the development of morphological ability.

### 5.4.2.2 Development of Morphological Ability

The present study points to the need to have a strong emphasis on a counterbalanced approach (Lyster, 2007). A counterbalanced approach implies using corrective feedback to help students become aware of French morphological and syntactic rules. Such an approach also helps French immersion students to better comprehend the texts they are reading. Lyster's approach helps in the processing of language through noticing, awareness and production activities.

Formal oral language games might be considered in drawing students' attention to the language structure before the onset of learning to read and beyond. Combining phonological and morphological training on reading acquisition would facilitate later reading achievement and produce a better reading achievement such as comprehension aspects (Demont \& Gombert, 1996). Students could benefit from a counterbalanced approach of grammatical skills and more

[^15]particularly morphological skills required for second language reading. This approach would imply the negotiation of language through content by means of interactional strategies that involve teacher scaffolding and corrective feedback.

The findings of this study also showed that vocabulary helps reading comprehension. Educators should be encouraged to work on the improvement of general vocabulary, second language culture-specific lexical choices and overall proficiency in the French language to lessen any difficulties in reading comprehension.

### 5.4.2.3 Development of Vocabulary

Vocabulary knowledge exerts a strong and direct influence on reading comprehension. Vocabulary knowledge and culture-specific lexical choices appear to be an extremely important factor in French immersion. A strong focus should be placed on vocabulary at multiple levels within the elementary school immersion programme. Instruction should be focused on two main objectives: (a) exposing French immersion students to many words of varying difficulty in numerous contexts, and (b) providing French immersion students with a deep understanding of words important to the texts they are listening to or reading. These words should be representative of academic or literary language used in texts throughout their school years. French immersion students should also build a large sight vocabulary in order to access word meanings automatically. Low-frequency words are of particular concern. In order that students better grasp the meaning of these difficult words, lessons should be designed to illustrate how both high and low frequency words are core to the material being studied (Sökmen, 1997).

Research by Coyne et al. (2004) indicates that the use of sophisticated words and related activities that structure students' opportunities to analyze and use words in many contexts is important to comprehension success. Instruction should be aimed at a deeper level of processing. Numerous encounters with a word in many different contexts should be provided as well as
lexical choices across francophone culture. French immersion students who encounter a word in a variety of activities and different contexts develop a more accurate understanding of its meaning and use. Better learning can also be fostered when a deeper level of semantic processing is required and the encoding of a word is more detailed. Students should practice words they have learned in multiple subject areas or contexts to promote the building of vocabulary knowledge (Goldman \& Rakestraw, 2000; Kame'enui, Dixon, \& Carnine, 1987).

As French immersion students are confronted with texts containing more complex and abstract language, reading comprehension will naturally become more challenging. This will occur as students move on to higher grades where education gets more decontextualized in content areas in French immersion such as Science or Social Studies. The difficulties in reading may appear to be considerable for second-language learners due to their more limited French oral proficiency. Students should be encouraged to read, play games (flash cards, riddles), do word associations (words, antonyms, sentences including the definition, visual representations) and use a dictionary. Extensive vocabulary training is crucial for efficient second language reading comprehension. Carver (1994) reported for example that $90 \%$ of the words in a text should be familiar for global reading comprehension.

In French immersion classes students have to read texts from francophone cultures with specific content. Students should be taught different words which have the same meaning in different francophone cultures as soon as is possible. Another pedagogical implication is the instruction of culture.

### 5.4.2.4 Development of Second Language Cultural Knowledge

Since second language cultural knowledge has been shown to be an important predictor of reading comprehension, teachers should read books from different francophone cultures. It would help build second language cultural knowledge in French immersion students, which
would in turn help them understand what they read. Teachers should also monitor students' problems in reading less familiar texts. Helping students cope with less familiar texts and/or specific lexical terminology would involve training them in such skills as inferring unknown meaning from the context. If students are not exposed to texts from francophone cultures that are progressively more diverse, those texts may still remain unfamiliar to them. Readers may then be unable to make hypotheses about the meaning of the text. Students may therefore fail to develop strategies necessary to read the text. Teachers need to implement instructional practices that enable students to make the connection between their semantic knowledge and text information they are reading. Reading then could become a more valuable source of exposure to the language, especially in written form.

Scaffolding would help French immersion students understand what they read and learn about specific cultural aspects included or alluded to in the text. Scaffolding instruction as a teaching strategy originates from Vygotsky's (1978) sociocultural theory and his concept of the zone of proximal development (ZPD).

In scaffolding instruction, a more 'knowledgeable other' provides supports to facilitate learner's development. The scaffolds facilitate a student's ability to build on prior knowledge and internalize new information. The 'more capable other' provides the scaffolds so that the learner can accomplish, with assistance, the task he or she could otherwise not complete. The 'more capable other' helps the learner through the ZPD (Bransford, Brown, \& Cocking, 2000). In the second language educational setting, the scaffolds are activities and tasks that may include models, hints, cues, cue-cards, prompts, partially completed examples, questions, think-aloud modeling and direct instruction of scenarios (Hartman, 2002) in the second language culture. These activities would help bridge the cultural knowledge gap between the more familiar culture
of the reader and the less familiar cultural information in the text (Andersson \& Barnitz, 1984; Barnitz, 1985; Carrell, Carson, \& Zhe, 1993; Carrell \& Eisterhold, 1988).

The results and findings of the present research have also implications for the programme development of French immersion in British Columbia. These will be explored next.

### 5.4.3 Programme Development Implications

The results and findings of the present research have also implications for the programme development of French immersion in British Columbia. Research that examines reading comprehension in the context of French immersion is particularly relevant in view of the increasingly multilingual nature of student populations in French immersion. The insights obtained through this research could be used to guide teachers in providing French immersion students the support required for academic success. This success could act to encourage more students to remain in the French immersion programme to secondary school graduation level.

The present research can contribute to the important task of making sure that all French immersion students are provided with equal opportunities to master the two official languages of Canada. The insights obtained through this research could add to the body of knowledge in the present bilingual Canadian context and should be of great interest to second language students, educators, scholars, and policy makers seeking to improve levels of bilingual literacy obtained by all members of Canadian society.

## CHAPTER 6: LIMITATIONS AND FUTURE RESEARCH

Although the present study provides new findings and insights, it has some limitations. In view of these limitations, suggestions for future research are also addressed in the following sections.

### 6.1 Limitations

The findings of this research provide further evidence that phonological awareness and spelling are important for word reading. Language development tasks, such as morphological and vocabulary knowledge, are important for reading comprehension. Emphasizing second language cultural knowledge in all areas of language development is also important.

The study was restricted to a set of variables considered important for the explanation of word reading and reading comprehension development: phonological awareness, spelling, morphological awareness, verbal working memory, vocabulary and second language cultural knowledge. While these components have been found to be extremely relevant for second language reading comprehension (Bernhardt, 2005), more in-depth study of actual secondlanguage reading behavior, attitudes, and second-language contact could provide a more complex picture of French immersion reading comprehension process. The tasks undertaken in this research were not content specific in reducing the possible effect of confounding variables regarding culture specific reading comprehension measurement. There is a limitation in the type of text used. The results of the present research are applicable to narrative texts only. The use of different types of text or genres would possibly show different results about the best predictors in second language comprehension.

With respect to the measurement instruments, the morphological awareness task required the participant to read a sentence in French and fill in the missing word to make the sentence
complete. The missing word covered different parts of the speech, such as nouns, verbs, adjectives, prepositions, conjunctions and punctuation. The reading comprehension of isolated sentences task also required readers to be aware of the internal morphology of sentences. The morphology of sentences allowed them to understand the meaning of the sentences being read in order to point to the right picture. The similarity in methodology might be an alternative explanation for the high correlation and independent contribution of morphological awareness to the reading comprehension of isolated sentences measure.

All the tasks were in the French language. Although, participants had the choice of recalling in English, all recalled the narrative texts in French. Lee (1986b) showed that second language students recall second language text better in the first language than in the second language. Nevertheless, French is the only language of instruction of the participants until Grade 3. They receive no formal reading instruction in their first language, which is often, but not exclusively English. They are exposed to informal literacy in first language at home or in their communities. Providing French immersion Grade 3 students with questions in English could have put some in an even more disadvantaged position. There is also a limitation in the measurement properties of the experimental dependent variable of reading comprehension of narrative texts with cultural emphasis and the experimental independent variable of second language cultural knowledge. Depending on the level of the reliability, the power of these tasks to reflect group differences and relationships among variables may be reduced due to measurement error.

With respect to the methods of analysis, the researcher used quantitative methods as the main approach with exploratory qualitative measures. The exploratory qualitative measures were complementary and helped answer some questions (for example difficulty encountered in reading comprehension of narrative texts with cultural emphasis and engagement towards a
cultural text) that the quantitative approach could not answer. A more in-depth study with a more developed qualitative approach would bring much more insight into the perceptions and the strategies that students use when reading in a second language. However, this was not the main goal of this research.

Replicating this study with a larger number of participants would result in a more definite answer to the research questions. The number of participants in the present study limits the extent to which these findings might be generalized to other French immersion groups. This limitation extends to the generalization of the research findings to other French immersion contexts. The present study involved participants at a particular age, living in a particular sociopolitical and sociocultural context. Caution should be taken if these research results are generalized to another city or province. French immersion curricular programmes in British Columbia are the source of linguistic experience. The attrition rate in any sample of developing bilingual children is important. In this research, the attrition rate was extremely low, $2.7 \%$. The analyses reported in this study can only be generalized to individuals who remain in the French immersion programme. It has been noted that only $50 \%$ to $60 \%$ of the students starting in Kindergarten continue until Grade 6 (Stern, 1991). Of this $50 \%$ to $60 \%$, some may not have continued due to geographic relocation. Others because parents decided to transfer their child from the French immersion to the English programme. Another portion may not have continued because their ability to read French content for comprehension may have been less advanced than those who remained. Immersion students may have had difficulties in achieving satisfactory growth within the French language programme.

The ratio of first language English to second language English participants in this study was 2 to 1 . Some participants had first languages with different orthography (14 Asian, 3 Arabic, 6 Slavic) which might have acted as an influence and/or impediment of the first language to the
third language 'French' (Geva \& Siegel, 2000). Readers of the present research should approach and engage with their own French immersion realities which will vary from province to province or country to country (Cummins, 2000; Genesee, 2006).

### 6.2 Suggestions for Future Research

This study is intended to serve as a first study in order that similar research can be conducted in other French immersion contexts. Because of the limited number of participants and the number of analyses on the data, this study should also be replicated in other immersion settings across British Columbia and Canada to see if similar results are obtained. It may be that the heterogeneity of immersion programs, such as early vs. late, rural vs. urban, or some provinces being more bilingual (e.g., New Brunswick) than others may provide different results.

An obvious next step requires the investigation of comprehension in French immersion students' reading development through middle and high school. At these levels the demands on reading comprehension abilities continue to increase and reading comprehension becomes central to academic success. Beyond Grade 3, heavier demands are placed on the readers, not just for obtaining a deeper understanding of text material, but also for working with more challenging aspects of foundational reading processes. Words to be read and spelled become more phonologically and morphologically complex as course material becomes more difficult (Leach, Scarborough, \& Rescorla, 2003). Furthermore, a true longitudinal design could also be useful. Such a design is necessary to identify valid longitudinal predictors of students 'at risk' of reading difficulties.

French immersion students also need to learn to read a different genre of informative texts in Science or Social Studies courses. Students generally only read narrative texts up to Grade 3. For second language speakers, progress in reading can falter when they are faced with a more difficult reading text material as they reach higher grades. Conducting longitudinal
research through the middle and high school years in French immersion would shed light on whether gains made in previous grades are retained and progress maintained.

Reading comprehension is crucial for second language acquisition to occur when factors known to affect text processing, such as morphological awareness, vocabulary and second language cultural knowledge, are accounted for. A future study could be to test the compensatory model of reading comprehension depending on the tasks at hand. This would involve testing the compensation between morphological awareness, vocabulary and second language cultural knowledge in reading comprehension depending on the type of text read. In practical terms, to test the compensatory model, a future study could involve reading comprehension of different types of texts to see if the same variables are the best predictors for the different types of texts: narrative, informative, argumentative, etc.

The present research offers clear evidence that word reading and reading comprehension are far from being influenced by a single process. The present research outlined the dominant roles played by phonological awareness and spelling in word reading, morphological and lexical knowledge in reading comprehension as well as second language cultural knowledge in the reading of texts with cultural emphasis. All these skills play a role in the reading process of developing French immersion students into bilingual students. The present research could be enriched by a longitudinal study from Grade 3 on to observe the evolution of each of the abilities when reading for comprehension. The results and findings of the present study encourage the consideration of additional directions for research to elaborate on the current compensatory model of second language reading and current theories of second language reading development.

## BIBLIOGRAPHY

Abu-Rabia, S., Share, D., \& Mansour, M. S. (2003). Word recognition and basic cognitive processes among reading-disabled and normal readers in Arabic. Reading and Writing: An Interdisciplinary Journal, 16(5), 423-442.
Abu-Rabia, S., \& Siegel, L. S. (2002). Reading, syntactic, orthographic, and working memory skills of bilingual Arabic-English speaking Canadian children. Journal of Psycholinguistic Research, 31(6), 661-678.
Adams, B. C., Bell, L. C., \& Perfetti, C. A. (1995). A trading relationship between reading skill and domain knowledge in children's text comprehension. Discourse Processes, 20(3), 307-323.
Adams, M. J. (1990). Beginning to read: Thinking and learning about print. Cambridge, MA: The MIT Press.
Adams, M. J., \& Collins, A. (1979). A schema-theoretic view of reading. In R. O. Freedle (Ed.), New directions in discourse processing (pp. 1-22). Norwood, NJ: Ablex Publishing.
Adams, S. (1982). Scripts and the recognition of unfamiliar vocabulary: Enhancing second language reading skills. The Modern Language Journal, 66(2), 155-159.
Alderson, J. C. (2000). Assessing reading. Cambridge, England: Cambridge University Press. Alderson, J. C., \& Urquhart, A. H. (1988). This test is unfair: I'm not an economist. In P. L. Carrell, J. Devine \& D. E. Eskey (Eds.), Interactive approaches to second language reading (pp. 168-182). Cambridge, England: Cambridge University Press.
Alegria, J., Pignot, E., \& Morais, J. (1982). Phonetic analysis of speech and memory codes in beginning readers. Memory and Cognition, 10(5), 451-456.
Alloway, T. P., Gathercole, S. E., Adams, A.-M., Willis, C., Eaglen, R., \& Lamont, E. (2005). Working memory and phonological awareness as predictors of progress towards early learning goals at school entry. British Journal of Developmental Psychology, 23(5), 417426.

Anderson, R. C., \& Nagy, W. (1991). Word meanings. In R. Barr, M. L. Kamil, P. B. Mosenthal \& P. D. Pearson (Eds.), Handbook of reading research (Vol. II, pp. 690-724). Mahwah, NJ: Erlbaum.
Anderson, R. C., \& Pearson, P. D. (1984). A schema-theoretic view of basic processes in reading comprehension. In P. D. Pearson, R. Barr, M. L. Kamil \& P. B. Mosenthal (Eds.), Handbook of reading research (pp. 255-291). Mahwah, NJ: Longman.
Anderson, R. C., Reynolds, R. E., Schallert, D. L., \& Goetz, E. T. (1977). Frameworks for comprehending discourse. American Educational Research Journal, 14(4), 367-381.
Anderson, R. C., Reynolds, R. E., Steffensen, M. S., \& Taylor, M. A. (1982). Cultural schemata and reading comprehension. Reading Research Quarterly, 17(3), 353-366.
Anderson, R. T. (2004). Phonological acquisition in preschoolers learning a second language via immersion: A longitudinal study. Clinical Linguistics \& Phonetics, 18(3), 183-210.
Andersson, B. V., \& Barnitz, J. G. (1984). Cross-cultural schemata and reading comprehension instruction. Journal of Reading, 28(2), 102-108.
Anfara, V. A., Jr., Brown, K. M., \& Mangione, T. L. (2002). Qualitative analysis on stage: Making the research process more public. Educational Researcher, 31(7), 28-38.
Armand, F. (2000). Le rôle des capacités métalinguistiques et de la compétence langagière orale dans l'apprentissage de la lecture en français langue première et seconde. The Canadian Modern Language Review/La Revue canadienne des langues vivantes, 56(3), 469-495.

Atkins, B. T., Duval, A., Milne, R. C., Lewis, H. M. A., Sinclair, L., \& Birks, R. (1991). The Collins Robert French-English Dictionnary (2nd ed.). Glasgow, England: Harper Collins. Australian Council for Educational Research. (1986). Progressive Achievement Test in Reading Comprehension and Vocabulary. Teacher's Handbook (2nd ed.). Hawthorn, Australia: Australian Council for Educational Research Limited.
Ausubel, D. P. (1963). The psychology of meaningful verbal learning. New York: Grune \& Stratton.
Bachman, L. F. (1990). Fundamental considerations in language testing. Oxford, England: Oxford University Press.
Baddeley, A., Aggleton, J., \& Conway, M. (Eds.). (2002). Episodic memory: New directions in research. New York: Oxford University Press.
Baddeley, A. D. (1983). Working memory. Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences, 302(1110, Functional aspects of human memory), 311-324.
Baddeley, A. D. (1986). Working memory. Oxford, England: Oxford University Press.
Baddeley, A. D. (1998). Human memory: Theory and practice. Needham Heights, MA: Allyn \& Bacon.
Baddeley, A. D. (2000). The episodic buffer: A new component of working memory. Trends in Cognitive Sciences, 4(11), 417-423.
Barnett, M. A. (1986). Syntactic and lexical/semantic skill in foreign language reading: Importance and interaction. The Modern Language Journal, 70(4), 343-349.
Barnitz, J. G. (1985). Reading development of non-native speakers of English. Orlando, FL: Harcourt, Brace, Jovanovich.
Barr, R., Kamil, M. L., Mosenthal, P. B., \& Pearson, P. D. (Eds.). (1991). Handbook of reading research (Vol. II). Mahwah, NJ: Erlbaum.
Barry, S., \& Lazarte, A. A. (1998). Evidence for mental models: How do prior knowledge, syntactic complexity, and reading topic affect inference generation in a recall task for nonnative readers of Spanish? The Modern Language Journal, 82(2), 176-193.
Bartlett, F. C. (1932). Remembering. Cambridge, England: Cambridge University Press.
Baudot, J. (1992). Fréquences d'utilisation des mots en français écrit contemporain. Montréal, Québec, Canada: Les Presses de l'Université de Montréal.
Baumann, J. F., Kame'enui, E. J., \& Ash, G. (2003). Research on vocabulary instruction: Voltaire redux. In J. Flood, J. R. Lapp, J. R. Squire \& J. Jensen (Eds.), Handbook of research on teaching the English language arts (2nd ed., pp. 752-785). Mahwah, NJ: Erlbaum.
Ben-Zeev, S. (1977). The influence of bilingualism on cognitive development and cognitive strategy. Child Development, 48(2), 1009-1018.
Bennett, M. J. (1993). Towards ethnorelativism: A developmental model of intercultural sensitivity. In R. M. Paige (Ed.), Education for intercultural experience ( $2 \mathrm{ed} ., \mathrm{pp} .21-$ 72). Yarmouth, ME: Intercultural Press.

Bentin, S., Deutsch, A., \& Liberman, I. Y. (1990). Syntactic competence and reading ability in children. Journal of Experimental Child Psychology, 48(1), 147-172.
Bernhardt, E. B. (1985). Reconstruction of literary texts by learners of German. In M. Heid (Ed.), New Yorker Werkstattgespräch 1984: Literarische Texte im Fremdsprache Unterricht (pp. 255-289). München, Germany: Kemmler \& Hoch.

Bernhardt, E. B. (1990). A model of L2 text reconstruction: The recall of literary text by learners of German. In A. Labarca \& L. M. Bailey (Eds.), Issues in L2: Theory as practice/practice as theory (pp. 21-43). Norwood, NJ: Ablex Publishing.
Bernhardt, E. B. (1991a). A psycholinguistic perspective on second language literacy. In J. H. Hulstijn \& J. F. Matter (Eds.), Reading in two languages, AILA Review 8(1) (pp. 31-44). Amsterdam: Free University Press.
Bernhardt, E. B. (1991b). Reading development in a second language: Theoretical, empirical, and classroom perspectives. Norwood, NJ: Ablex Publishing.
Bernhardt, E. B. (2005). Progress and procrastination in second language reading. Annual Review of Applied Linguistics, 25, 133-150.
Bernhardt, E. B. (2009). Increasing reading opportunities for English language learners. In E. H. Hiebert (Ed.), Reading more, reading better: Are students reading enough of the right stuff? (pp. 1-27). New York: Guilford Press.
Bernhardt, E. B., \& Kamil, M. L. (1995). Interpreting relationships between L1 and L2 reading: Consolidating the linguistic threshold and the linguistic interdependence hypotheses. Applied Linguistics, 16(1), 15-34.
Bialystok, E. (1988). Levels of bilingualism and levels of linguistic awareness. Developmental Psychology, 24(4), 560-567.
Bialystok, E., \& Herman, J. (1999). Does bilingualism matter for early literacy? Bilingualism: Language and Cognition, 2(1), 35-44.
Bindman, M. (2004). Grammatical awareness across languages and the role of social context: Evidence from English and Hebrew. In T. Nunes \& P. Briant (Eds.), Handbook of children's literacy (pp. 691-709). Dordrecht, The Netherlands: Kluwer Academic.
Blachman, B. A. (1994). Early literacy acquisition: The role of phonological awareness. In A. C. Davis (Ed.), Language learning disabilities in school-age children and adolescents: Some principles and applications (pp. 253-274). New York: Macmillan College.
Block, E. L. (1992). See how they read: Comprehension monitoring of L1 and L2 readers. TESOL Quarterly, 26(2), 319-343.
Bournot-Trites, M. (2005, June 24-26). Preventing reading difficulties in French immersion and francophone schools through phonemic awareness and phonics. Paper presented at the Twelfth Annual Meeting of the Society for the Scientific Study of Reading, Toronto, Ontario, Canada.
Bournot-Trites, M., \& Denizot, I. (2005a). Conscience phonologique en immersion française au Canada. In M. Billières \& N. Spanghero-Gaillard (Eds.), Colloque international de didactique cognitive: Actes des communications orales et affichées (pp. 26-37). Toulouse, France: Université de Toulouse Le Mirail, Laboratoire Jacques Lordat.
Bournot-Trites, M., \& Denizot, I. (2005b). Relations entre la conscience phonologique en français et en anglais et la lecture de mots et la compréhension en lecture en immersion française. Revue PArole, 34-35-36, 45-69.
Bournot-Trites, M., Denizot, I., \& Siegel, L. (In preparation). Comparing phonological awareness in French immersion and in the regular English programme.
Bournot-Trites, M., \& Séror, J. (2003). Students' and teachers' perception about strategies which promote proficiency in second language writing. The Canadian Journal of Applied Linguistics, 6(2), 129-157.
Bowey, J. A. (1986). Syntactic awareness in relation to reading skill and ongoing reading comprehension monitoring. Journal of Experimental Child Psychology, 41(2), 282-299.

Bowey, J. A. (1994a). Grammatical awareness and learning to read: A critique. In E. M. H. Assink (Ed.), Literacy acquisition and social context (pp. 122-149). London: Harvester Wheatsheaf.
Bowey, J. A. (1994b). Phonological sensitivity in novice readers and nonreaders. Journal of Experimental Child Psychology, 58, 134-159.
Bradley, L., \& Bryant, P. E. (1983a). Categorizing sounds and learning to read - a causal connection. Nature, 301, 419-421.
Bradley, L., \& Bryant, P. E. (1983b). Phonological skills before and after learning to read. In S. A. Brady \& D. P. Shankweiler (Eds.), Phonological processes in literacy: A tribute to Isabelle Y. Liberman (pp. 37-45). Hillsdale, NJ: Erlbaum.
Bransford, J. D., Brown, A. L., \& Cocking, R. R. (2000). How people learn: Brain, mind, and experience and school. Washington, DC: National Academy Press.
Bransford, J. D., \& Johnson, M. K. (1973). Considerations of some problems for understanding: Some investigations of comprehension and recall. In W. G. Chase (Ed.), Visual information processing (pp. 383-438). New York: Academic Press.
Brooks, N. (1968). Teaching culture in the foreign language classroom. Foreign Language Annals, 1(3), 204-217.
Bruck, M. (1988). The word recognition and spelling of dyslexic children. Reading Research Quarterly, 23(1), 51-69.
Bruck, M., \& Genesee, F. (1995). Phonological awareness in young second language learners. Journal of Child Language, 22(2), 307-324.
Bruck, M., Genesee, F., \& Caravolas, M. (1997). A cross-linguistic study of early literacy acquisition. In B. A. Blachman (Ed.), Foundations of reading acquisition and dyslexia: Implications for early intervention (pp. 145-162). Mahwah, NJ: Erlbaum.
Bruck, M., \& Treiman, R. (1990). Phonological awareness and spelling in normal children and dyslexics: The case of initial consonant clusters. Journal of Experimental Child Psychology, 50(1), 156-178.
Bruner, J. (1996). The culture of education. Cambridge, MA: Harvard University Press.
Bryant, P. E., MacLean, M., \& Bradley, L. (1990a). Rhyme, language, and children's reading. Applied Psycholinguistics, 11(3), 237-252.
Bryant, P. E., MacLean, M., Bradley, L., \& Crossland, J. (1990b). Rhyme and alliteration, phoneme detection, and learning to read. Developmental Psychology, 26(3), 429-438.
Bugel, K., \& Buunk, B. P. (1996). Sex differences in foreign language text comprehension: The role of interests and prior knowledge. The Modern Language Journal, 80(1), 15-31.
Byram, M. (1997). Teaching and assessing intercultural communicative competence. Clevedon, England: Multilingual Matters.
Byrne, B., \& Fielding-Barnsley, R. (1989). Phonemic awareness and letter knowledge in the child's acquisition of the alphabetic principle. Journal of Educational Psychology, 81(3), 313-321.
Byrne, B., \& Fielding-Barnsley, R. (1993). Evaluation of a program to teach phonemic awareness to young children: A 1-year follow-up. Journal of Educational Psychology, 85(1), 104-111.
Cain, K. (2007). Syntactic awareness and reading ability: Is there any evidence for a special relationship? Applied Psycholinguistics, 28(4), 679-694.
Cain, K., Oakhill, J. V., \& Bryant, P. E. (2000). Investigating the causes of reading comprehension failure: The comprehension-age match design. Reading and Writing: An Interdisciplinary Journal, 12(1-2), 31-40.

Cain, K., Oakhill, J. V., \& Bryant, P. E. (2004a). Children's reading comprehension ability: Concurrent prediction by working memory, verbal ability, and component skills. Journal of Educational Psychology, 96(1), 31-42.
Cain, K., Oakhill, J. V., \& Lemmon, K. (2004b). Individual differences in the inference of word meanings from context: The influence of reading comprehension, vocabulary knowledge, and memory capacity. Journal of Educational Psychology, 96(4), 671-681.
Calfee, R. C., Lindamood, P., \& Lindamood, C. (1973). Acoustic-phonetic skills in reading: Kindergarten through 12th grade. Journal of Educational Psychology, 64(3), 293-298.
Campbell, A. J. (1981). Language background and comprehension. The Reading Teacher, 35(1), 10-14.
Caravolas, M. (1993). Language-specific influences of phonology and orthography on emergent literacy. In J. Altarriba (Ed.), Cognition and culture: A cross-cultural approach to psychology (pp. 177-205). New York: Elsevier Science.
Carlisle, J. F. (1995). Morphological awareness and early reading achievement. In L. B. Feldman (Ed.), Morphological aspects of language processing (pp. 189-209). Hilsdale, NJ: Erlbaum.
Carlisle, J. F., Beeman, M., Davis, L. H., \& Spharim, G. (1999). Relationship of metalinguistic capabilities and reading achievement for children who are becoming bilingual. Applied Psycholinguistics, 20(4), 459-478.
Carrell, P. L. (1981a). Culture-specific schemata in L2 comprehension. In R. A. Orem \& J. F. Haskell (Eds.), Selected papers from the ninth Illinois TESOL/BE Annual Convention and the first Midwest TESOL Conference (pp. 123-132). Chicago, IL: TESOL/BE.
Carrell, P. L. (1981b, March). The role of schemata in L2 comprehension. Paper presented at the 15th Annual TESOL Convention, Detroit, MI.
Carrell, P. L. (1983a, March, 17). Some classroom implications and applications of recent research into schema theory and EFL/ESL reading. Paper presented at the Annual TESOL Convention, Toronto, Ontario, Canada.
Carrell, P. L. (1983b). Some issues in studying the role of schemata, or background knowledge, in second language comprehension. Reading in a Foreign Language, 1(2), 81-82.
Carrell, P. L. (1983c). Three components of background knowledge in reading comprehension. Language Learning, 33(2), 183-207.
Carrell, P. L. (1984a). The effects of rhetorical organization on ESL readers. TESOL Quarterly, 18(3), 441-469.
Carrell, P. L. (1984b). Evidence of a formal schema in second language comprehension. Language Learning, 34(2), 87-112.
Carrell, P. L. (1985). Facilitating ESL reading by teaching text structure. TESOL Quarterly, 19(4), 727-752.
Carrell, P. L. (1987). Content and formal schemata in ESL reading. TESOL Quarterly, 21(3), 461-481.
Carrell, P. L. (1988). Introduction. In P. L. Carrell, J. Devine \& D. E. Eskey (Eds.), Interactive approaches to second language reading (pp. 1-7). Cambridge, England: Cambridge University Press.
Carrell, P. L., Carson, J. G., \& Zhe, D. (1993). First-and- second language reading strategies: Evidence from cloze. Reading in a Foreign Language, 10(1), 953-965.
Carrell, P. L., Devine, J., \& Eskey, D. E. (1988). Interactive approaches to second language reading. New York: Cambridge University Press.

Carrell, P. L., \& Eisterhold, J. C. (1988). Schema theory and ESL reading pedagogy. In P. L. Carrell, J. Devine \& D. E. Eskey (Eds.), Interactive approaches to second language reading (pp. 73-92). Cambridge, England: Cambridge University Press.
Carrell, P. L., \& Grabe, W. (2002). Reading. In N. Schmitt (Ed.), An introduction to applied linguistics (pp. 233-250). London: Arnold.
Carrell, P. L., \& Wallace, B. (1983). Background knowledge: Context and familiarity in reading comprehension. In M. A. Clarke \& J. Handscombe (Eds.), TESOL '82 (pp. 245-308). Washington, DC: TESOL.
Carrell, P. L., \& Wise, T. E. (1998). The relationship between prior knowledge and topic interest in second language reading. Studies in Second Language Acquisition, 20(3), 285-309.
Carroll, J. M. (2004). Letter knowledge precipitates phoneme segmentation, but not phoneme invariance. Journal of Research in Reading, 27(3), 212-225.
Carrow-Woolfolk, E. (1985). Test for auditory comprehension of language (TACL-R Test). Allen, TX: DLM Teaching Resources.
Carver, R. P. (1994). Percentage of unknown vocabulary words in text as a function of the relative difficulty of the text: Implications for instructions. Journal of Reading Behavior, 26(4), 413-437.
Casalis, S., \& Louis-Alexandre, M.-F. (2000). Morphological analysis, phonological analysis and learning to read French: A longitudinal study. Reading and Writing: An Interdisciplinary Journal, 12(3), 303-335.
CASLT. (2008). FSL programs in Canada: Fact sheet. Retrieved June 29, 2008, from http:///www.caslt.org/pdf/eng/facts/FSL_Programs_in_Canas_Fact_Sheet.pdf
Castiglioni-Spalten, M. L., \& Ehri, L. C. (2003). Phonemic awareness instruction: Contribution of articulatory segmentation to novice beginners' reading and spelling. Scientific Studies of Reading, 7(1), 25-52.
Catts, H. W., Adolf, S. M., \& Ellis Weismer, S. (2006). Language deficits in poor comprehenders: A case for a simple view of reading. Journal of Speech Language and Hearing Research, 49(2), 278-293.
Chen, H.-C., \& Graves, M. F. (1995). Effects of previewing and providing background knowledge on Taiwanese college students' comprehension of American short stories. TESOL Quarterly, 29(4), 663-686.
Chiappe, P., Hasher, L., \& Siegel, L. S. (2000). Working memory, inhibitory control, and reading disability. Memory \& Cognition, 28(1), 8-17.
Chiappe, P., \& Siegel, L. S. (1999). Phonological awareness and reading acquisition in Englishand Punjabi-speaking Canadian children. Journal of Educational Psychology, 91(1), 2028.

Chiappe, P., Siegel, L. S., \& Gottardo, A. (2002a). Reading-related skills of kindergartners from diverse linguistic backgrounds. Applied Psycholinguistics, 23(1), 95-116.
Chiappe, P., Siegel, L. S., \& Wade-Woolley, L. (2002b). Linguistic diversity and the development of reading skills: A longitudinal study. Scientific Studies of Reading, 6(4), 369-400.
Cisero, C. A., \& Royer, J. M. (1995). The development and cross-language transfer of phonological awareness. Contemporary Educational Psychology, 20(3), 275-303.
Clapham, C. (1996). The development of IELTS: A study of the effect of background knowledge on reading comprehension (Vol. 4). Cambridge, England: Cambridge University Press.
Clarke, M. A. (1980). The short circuit hypothesis of ESL reading or when language competence interferes with reading performance. The Modern Language Journal, 64(2), 203-209.

Cohen, J. (1992). A power primer. Psychological Bulletin, 112(1), 155-159.
Comeau, L., Cormier, P., Grandmaison, É., \& Lacroix, D. (1999). A longitudinal study of phonological processing skills in children learning to read in a second language. Journal of Educational Psychology, 91(1), 29-43.
Connor, U. (1984). Recall of text: Differences between first- and second-language readers. TESOL Quarterly, 18(2), 239-255.
Content, A. (1991). The effect of spelling-to-sound regularity on naming in French. Psychological Research, 53(1), 3-12.
Cormier, P., Grandmaison, É., MacDonald, G. W., \& Ouellette-Lebel, D. (1995). Développement d'un test d'analyse auditive en français: Normes et validation de construit (Development of a test of auditory analysis in French: Norms and construct validation). Revue des Sciences de l'Éducation, 21(2), 223-240.
Cormier, P., \& Kelson, S. (2000). The roles of phonological and syntactic awareness in the use of plural morphemes among children in French immersion. Scientific Studies of Reading, 4(4), 267-293.
Council of Europe. (2001). Common European framework of reference for languages. Cambridge, England: Cambridge University Press.
Coyne, M., Simmons, D., Kame'enui, E. J., \& Stoolmiller, M. (2004). Vocabulary instruction for young children at risk for experiencing reading difficulties: Teaching word meanings through shared storybook readings. In J. F. Baumann \& E. J. Kame'enui (Eds.), Vocabulary instruction: From research to practice (pp. 41-58). New York: Guildford.
CPF. (2006). The state of French-second-language education in Canada. Annual Report, Appendix 2, 93.
Creswell, J. W. (2003). Research design: Qualitative, quantitative and mixed methods approaches (2nd ed.). Thousand Oaks, CA: Sage Publications.
Cummins, J. (2000). Immersion education for the millennium: What we have learned from 30 years of research on second language immersion. Retrieved August 25, 2004, from http://www.iteachilearn.com/cummins/immersion2000.html
Cunningham, A. E., \& Stanovich, K. E. (1990). Assessing print exposure and orthographic processing skills in children: A quick measure of reading experience. Journal of Educational Psychology, 82(4), 733-740.
Cupples, L., \& Holmes, V. M. (1992). Evidence for a difference in syntactic knowledge between skilled and less skilled adult learners. Journal of Psycholinguistic Research, 21(4), 249274.

Cutler, A., Mehler, J., Norris, D., \& Segui, J. (1986). The syllables differing role in the segmentation of French and English. Journal of Memory and Language, 25(4), 385-400.
Da Fontura, H. A., \& Siegel, L. S. (1995). Reading, syntactic, and working memory skills of bilingual Portuguese-English Canadian children. Reading and Writing: An Interdisciplinary Journal, 7(1), 139-153.
Davydovskaia, M., Goetry, V., \& Wade-Woolley, L. (2004). Orthographic differentiation between first- and second-language in the reading and spelling of French immersion students, Queen's University, Toronto, Ontario, Canada.
Day, R. R., \& Bamford, J. (1998). Extensive reading in the second language classroom. Cambridge, England: Cambridge University Press.
Deacon, S., Wade-Woolley, L., \& Kelly, K. (2006). Flex those muscles: The variety of skills that developing bilingual children use when they read. Paper presented at the 30th Annual Boston University Conference on Language Development, Sommerville, MA.

Deacon, S., Wade-Woolley, L., \& Kirby, S. (2007). Crossover: The role of morphological awareness in French immersion children's reading. Developmental Psychology, 43(3), 732-746.
Deacon, S. H., \& Kirby, J. R. (2004). Morphological awareness: Just "more phonological"? The roles of morphological and phonological awareness in reading development. Applied Psycholinguistics, 25(2), 223-238.
Demont, E. (2001). Contribution de l'apprentissage précoce d'une deuxième langue au développement de la conscience linguistique et à l'apprentissage de la lecture. International Journal of Psychology, 36(4), 274-285.
Demont, E., \& Gombert, J.-É. (1996). Phonological awareness as a predictor of recoding skills and syntactic awareness as a predictor of comprehension skills. British Journal of Educational Psychology, 66(3), 315-332.
Desrochers, A. (2007). Échelle de compétences grammaticales en français écrit. Unpublished document, Laboratoire de psychologie cognitive du langage, Université d'Ottawa, Ottawa, Ontario, Canada.
Droop, M., \& Verhoeven, L. (1998a). Background knowledge, linguistic complexity, and second language reading comprehension. Journal of Literary Research, 30(2), 253-271.
Droop, M., \& Verhoeven, L. (1998b). Reading comprehension problems in second language learners. In P. Reitsma \& L. Verhoeven (Eds.), Problems and interventions in literacy development (pp. 193-208). Dordrecht, The Netherlands: Kluwer Academic.
Droop, M., \& Verhoeven, L. (2003). Language proficiency and reading ability in first- and second-language learners. Reading Research Quarterly, 38(1), 78-103.
Dunn, L. M., \& Dunn, L. M. (1997). Peabody Picture Vocabulary Test, (PPVT-III) (3rd ed.). Circle Pines, MN: American Guidance Service.
Dunn, L. M., Thériault-Whalen, C. M., \& Dunn, L. M. (1993a). Manuel pour les formes $A$ et $B$ de l'échelle de vocabulaire en images Peabody: Adaptation française du Peabody Picture Vocabulary Test. Toronto, Ontario, Canada: PSYCAN.
Dunn, L. M., Thériault-Whalen, C. M., \& Dunn, L. M. (1993b). Échelle de vocabulaire en images Peabody: Adaptation française du Peabody Picture Vocabulary Test. Toronto, Ontario, Canada: PSYCAN.
Durgunoğlu, A. Y., Nagy, W. E., \& Hancin-Bhatt, B. J. (1993). Cross-language transfer of phonological awareness. Journal of Educational Psychology, 85(3), 453-465.
Ehri, L. C. (1986). Sources of difficulty in learning to spell and read. In M. L. Wolraich \& D. Routh (Eds.), Advances in developmental and behavioral pediatrics (Vol. 7, pp. 121195). Greenwich, CT: JAI Press.

Ehri, L. C. (1989). Apprendre à lire et à écrire les mots. In L. Rieben \& C. A. Perfetti (Eds.), L'apprenti lecteur: Recherches emiriques et implications pédagogiques (pp. 103-127). Neuchâtel, Suisse: Delachaux \& Niestlé.
Ehri, L. C. (1991). Learning to read and spell words. In L. Rieben \& C. A. Perfetti (Eds.), Learning to read: Basic research and its implications (pp. 57-73). Hillsdale, NJ: Lawrence Erlbaum.
Ehri, L. C. (1995). Phases of development in learning to read words by sight. Journal of Research in Reading, 18(2), 116-125.
Ehri, L. C. (1996). Word reading by sight and by analogy in beginning readers. In C. Hulme \& R. M. Joshi (Eds.), Reading and spelling: Development and disorders (pp. 87-112). Mahwah, NJ: Lawrence Erlbaum.

Ehri, L. C. (1998). Grapheme-phoneme knowledge is essential to learning to read words in English. In J. L. Metsala \& L. C. Ehri (Eds.), Word recognition in beginning literacy (pp. 3-40). Mahwah, NJ: Erlbaum.
Ehri, L. C. (1999). Phases of development in learning to read words. In J. V. Oakhill \& R. Beard (Eds.), Reading development and the teaching of reading (pp. 79-108). Oxford, England: Blackwell.
Ehri, L. C., Nunes, S. R., Stahl, S. A., \& Willows, D. M. (2001). Systematic phonics instruction helps students learn to read: Evidence from the National Reading Panel's meta-analysis. Review of Educational Research, 71(3), 393-447.
Ehri, L. C., \& Wilce, L. S. (1983). Development of word identification speed in skilled and less skilled beginning readers. Journal of Educational Psychology, 75(1), 3-18.
Elbro, C., \& Petersen, D. K. (2004). Long-term effects of phoneme awareness and letter sound training: An intervention study with children at risk for dyslexia. Journal of Educational Psychology, 96(4), 660-670.
Eskey, D. E. (1986). Theoretical foundations. In F. Dublin, D. E. Eskey \& W. Grabe (Eds.), Teaching second language and reading for academic purposes (pp. 3-23). Reading, MA: Addison-Wesley.
Favreau, M., Komoda, M. K., \& Segalowitz, N. S. (1980). Second language reading: Implications of the word superiority effect in skilled bilinguals. Canadian Journal of Psychology/Revue canadienne de psychologie, 34(4), 370-380.
Favreau, M., \& Segalowitz, N. S. (1982). Second language reading in fluent bilinguals. Applied Psycholinguistics, 3(4), 329-341.
Favreau, M., \& Segalowitz, N. S. (1984). Automatic and controlled processes in the first- and second-language reading of fluent bilinguals. Memory and Cognition, 11(6), 565-574.
Floyd, P., \& Carrell, P. L. (1987). Effects on ESL reading of teaching cultural content schemata. Language Learning, 37(1), 89-108.
Fontana, A., \& Frey, J. H. (2000). The interview: From structured questions to negotiated texts. In N. K. Denzin \& Y. S. Lincoln (Eds.), Handbook of qualitative research (pp. 645-672). Thousand Oaks, CA: Sage Publications.
Freebody, P. (2007). Literacy education in school: Research perspectives from the past, for the future. Australian Educational Review, 52, 1-83.
Freebody, P., \& Anderson, R. C. (1983a). Effects of vocabulary difficulty, text cohesion, and schema availability on reading comprehension. Reading Research Quarterly, 18(3), 277294.

Freebody, P., \& Anderson, R. C. (1983b). Effects on text comprehension of differing proportions and locations of difficult vocabulary. Journal of Reading Behavior, 15(3), 19-39.
Garcia, G. E. (1991). Factors influencing the English reading test performance of Spanishspeaking Hispanic children. Reading Research Quarterly, 26(4), 371-392.
Gatbonton, E. C., \& Tucker, G. R. (1971). Cultural orientation and the study of foreign literature. TESOL Quarterly, 5(2), 137-143.
Gaux, C. (1996). Liens entre maîtrises phonologique \& morpho-syntaxique orales et niveaux de lecture chez les pré-adolescents. Unpublished Thèse de Doctorat, Université de Bourgogne, Dijon, France.
Gaux, C., \& Gombert, J.-É. (1999a). Implicit and explicit syntactic knowledge and reading in pre-adolescents. British Journal of Developmental Psychology, 17(2), 169-188.
Gaux, C., \& Gombert, J.-É. (1999b). La conscience syntaxique chez les préadolescents: Questions de méthodes. L'année psychologique, 99(1), 45-74.

Geertz, C. (1973). The interpretation of cultures. New York: Random House. Genesee, F. (1979). Acquisition of reading skills in immersion programs. Foreign Language Annals, 12(1), 71-77.
Genesee, F. (1987). Learning through two languages: Studies of immersion and bilingual education. Cambridge, MA: Newbury House.
Genesee, F. (2006). The suitability of French immersion for students who are at risk: A review of research evidence (pp. 1-44): McGill University, Montreal, Québec, Canada.
Genesee, F. (2007). Literacy outcomes in French immersion. Retrieved December 13, 2007, from http://www.literacyencyclopedia.ca/pdfs/topic.php?topID=27
Geva, E. (2000). Issues in the assessment of reading disabilities in L2 children: Beliefs and research evidence. Dyslexia, 6(1), 13-28.
Geva, E., \& Siegel, L. S. (2000). Orthographic and cognitive factors in the concurrent development of basic reading skills in two languages. Reading and Writing, 12(1), 1-30.
Geva, E., \& Wade-Woolley, L. (1998). Component processes in becoming English Hebrew literate. In A. Y. Durgunoğlu \& L. Verhoeven (Eds.), Literacy development in multilingual context: Cross-cultural perspectives (pp. 85-110). Mahwah, NJ: Erlbaum.
Geva, E., Wade-Woolley, L., \& Shany, M. (1997). Development of reading proficiency in first and second language. Scientific Studies of Reading, 1(2), 119-144.
Geva, E., Yaghoub-Zadeh, Z., \& Schuster, B. V. (2000). Understanding individual differences in word recognition skills of ESL children. Annals of Dyslexia, 50, 123-154.
Gholamain, M., \& Geva, E. (1999). Orthographic and cognitive factors in the concurrent development of basic reading skills in English and Persian. Language Learning, 49(2), 183-217.
Goldman, S. R., \& Rakestraw, J. A. (2000). Structural aspects of constructing meaning from text. In M. L. Kamil, P. B. Mosenthal, P. D. Pearson \& R. Barr (Eds.), Handbook of reading research (Vol. III, pp. 311-335). Mahwah, NJ: Erlbaum.
Gombert, J.-É. (1992). Metalinguistic development. New York: Harvester Wheatsheaf.
Gombert, J.-É., Colé, P., Valdois, S., Goigoux, R., Mousty, P., \& Fayol, M. (2000). Enseigner la lecture au cycle 2. Paris: Nathan Pédagogie.
Gombert, J.-É., Gaux, C., \& Demont, E. (1994). Capacités métalinguistiques en lecture. Quels liens? Repères, 9, 61-73.
Goode, T., Sockalingam, S., Brown, M., \& Jones, W. (2000). A planner's guide. Infusing principles, content and themes related to cultural and linguistic competence into meetings and conferences. Washington, DC: Georgetown University Center for Child and Human Development, National Center for Cultural Competence.
Goodman, K. S. (1968). The psycholinguistic nature of the reading process. Detroit, MI: Wayne State University Press.
Goodman, K. S. (1970). Reading: A psycholinguistic guessing game. In H. Singer \& R. B. Ruddell (Eds.), Theoretical models and processes of reading (1st ed., pp. 259-272). Newark, DE: International Reading Association.
Goodman, K. S. (1988). The reading process. In P. L. Carrell, J. Devine \& D. E. Eskey (Eds.), Interactive approaches to second language reading (pp. 11-21). Cambridge, England: Cambridge University Press.
Goodrich, R. L., \& St-Pierre, R. G. (1979). Opportunities for studying later effects of Follow Through. Cambridge, MA: Abt Assoicates.

Gottardo, A., Stanovich, K. E., \& Siegel, L. S. (1996). The relationships between phonological sensitivity, syntactic processing, and verbal working memory in the reading performance of third-grade children. Journal of Experimental Child Psychology, 63(3), 563-582.
Gottardo, A., Yan, B., Siegel, L. S., \& Wade-Woolley, L. (2001). Factors related to English reading performance in children with Chinese as a first language: More evidence of cross-language transfer of phonological processing. Journal of Educational Psychology, 93(3), 530-542.
Gough, P. B. (1972). One second of reading. In F. J. Kavanagh \& G. Mattingly (Eds.), Language by ear and by eye (pp. 331-358). Cambridge, MA: The MTT Press.
Gough, P. B., Juel, C., \& Griffith, P. L. (1992). Reading, speaking and the orthographic cipher. In P. B. Gough, L. C. Ehri \& R. Treiman (Eds.), Reading acquisition. Hillsdale, NJ: Erlbaum.
Gough, P. B., \& Tunmer, W. E. (1986). Decoding, reading, and reading disability. Remedial and Special Education, 7(1), 6-10.
Grabe, W. (1988). Reassessing the term "interactive". In P. L. Carrell, J. Devine \& D. E. Eskey (Eds.), Interactive approaches to second language reading (pp. 56-70). Cambridge, England: Cambridge University Press.
Grabe, W. (2000). Reading research and its implications for reading assessment. In A. J. Kuman (Ed.), Fairness and validation in language assessment: Selected papers from the 19th language testing research colloquium (pp. 226-262). Cambridge, England: Cambridge University Press.
Grabe, W. (2002). Reading in a second language. In R. B. Kaplan (Ed.), The Oxford handbook of applied linguistics (pp. 49-59). Oxford, England: Oxford University Press.
Graesser, A., Singer, M., \& Trabasso, T. (1994). Constructing inferences during narrative text comprehension. Psychological Review, 101(3), 371-395.
Graves, M. F. (1986). Vocabulary learning and instruction. In E. Z. Rotzkopf \& L. C. Ehri (Eds.), Review of Educational research (Vol. 13, pp. 49-89). Washington, DC: American Educational Research Association.
Guthrie, J. T., Wigfield, A., Barbosa, P., Perencevich, K. C., Taboada, A., Davis, M. H., et al. (2004). Increasing reading comprehension and engagement through concept-oriented reading instruction. Journal of Educational Psychology, 96(3), 403-423.
Haas, E., \& Willows, D. (1998, December). The development of spelling in a balanced literacy program: Assessing growth of phonological and orthographic knowledge. Paper presented at the National Reading Conference, Austin, TX.
Hair, J. F., Black, B., Babin, B., Anderson, R., \& Tatham, R. (2005). Multivariate data analysis (6th ed.). Upper Saddle River, NJ: Prentice Hall.
Hammadou, J. (1990). The effects of analogy on French reading comprehension. The French Review, 64(2), 239-252.
Hammadou, J. (1991). Interrelationships among prior knowledge, inference, and language proficiency in foreign language reading. The Modern Language Journal, 75(1), 27-38.
Harris, T. L., \& Hodges, R. H. (1995). The literacy dictionary: The vocabulary of reading and writing. Newark, DE: International Reading Association.
Hartman, H. (2002). Scaffolding and cooperative learning. In H. Hartman (Ed.), Human learning and instruction (pp. 23-69). New York: City College of City University of New York.
Hasher, L., Zacks, R. T., \& May, C. P. (1999). Inhibitory control, circadian arousal, and age. In D. Gopher \& A. Koriat (Eds.), Attention and performance XVII, Cognitive regulation of
performance: Interaction of theory and application (pp. 653-675). Cambridge, MA: MTT Press.
Henderson, E. H. (1985). Teaching spelling. Boston: Houghton Mifflin.
Hogan, T. P., Catts, H. W., \& Little, T. D. (2005). The relationship between phonological awareness and reading: Implications for the assessment of phonological awareness. Language Speech and Hearing Services in Schools, 36(4), 285-293.
Hogan, T. P., \& Harris, R. (2005). Reading development in first and second languages: The case of French immersion in an urban school district. Paper presented at the 4th Annual Network Conference of Canadian Language and Literacy Research Network, Toronto, Ontario, Canada.
Hoover, W. A., \& Gough, P. (1990). The simple view of reading. Reading and Writing: An Interdisciplinary Journal, 2(2), 127-160.
Hsueh-Chao, M. H., \& Nation, P. (2000). Unknown vocabulary density and reading comprehension. Reading in a Foreign Language, 13(1), 403-430.
Huber, P. J. (1981). Robust statistics. New York: John Wiley \& Sons.
Hudson, T. (1982). The effects of induced schemata on the "short circuit" in L2 reading: Nondecoding factors in L2 reading performance. Language Learning, 32(1), 1-31.
Iversen, S., \& Tunmer, W. E. (1993). Phonological processing skills and the reading recovery program. Journal of Educational Psychology, 85(1), 112-126.
Jiménez, R. T., Garcia, G. E., \& Pearson, P. D. (1995). Three children, two languages, and strategic reading: Case studies in bilingual/monolingual reading. American Educational Research Journal, 32(1), 67-97.
Jiménez, R. T., Garcia, G. E., \& Pearson, P. D. (1996). The reading strategies of bilingual Latina/o students who are successful English readers: Opportunities and obstacles. Reading Research Quarterly, 31(1), 90-112.
Johnson, J. M. (2002). In-depth interviewing. In J. F. Gubrium \& J. A. Holstein (Eds.), The handbook of interview research: Context \& method (pp. 103-120). Thousand Oaks, CA: Sage Publications.
Johnson, P. (1981). Effects of reading comprehension of language complexity and cultural background of a text. TESOL Quarterly, 15(2), 169-181.
Johnson, P. (1982). Effects of reading comprehension of building background knowledge. TESOL Quarterly, 16(4), 503-516.
Johnson, R. E. (1970). Recall of prose as a function of the structural importance of linguistic units. Journal of Verbal Learning and Verbal Behavior, 9(1), 12-20.
Johnston, A. M., Barnes, M. A., \& Desrochers, A. (2008). Reading comprehension: Developmental process, individual differences and interventions. Canadian Psychology, 49(2), 125-132.
Johnston, P. H. (1984). Prior knowledge and reading comprehension test bias. Reading Research Quarterly, 19(2), 219-239.
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(4), 835851.

Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. Journal of Educational Psychology, 80(4), 437-447.
Juel, C., Griffith, P. L., \& Gough, P. B. (1986). Acquisition of literacy: A longitudinal study of children in first and second grade. Journal of Educational Psychology, 78(4), 243-255.

Just, M. A., \& Carpenter, P. A. (1987). The psychology of reading and language comprehension. Boston, MA: Allyn and Bacon.
Kame'enui, E. J., Dixon, R. C., \& Carnine, D. W. (1987). Issues in the design of vocabulary instruction. In M. G. McKeown \& M. E. Curtis (Eds.), The nature of vocabulary acquisition (pp. 129-145). Hillsdale, NJ: Erlbaum.
Kang, H. W. (1992). Cultural inference in second language reading. International Journal of Applied Linguistics, 2(1), 95-119.
Kant, I. (1781). Critique of pure reason (N. K. Smith, Trans.). London: Macmillan.
Keep, L. J. (1993). French immersion attrition: Implications for model building. Unpublished doctoral dissertation, University of Alberta, Calgary, Canada.
Kendall, J. R., Lajeunesse, G., Chmilar, P., Shapson, L. R., \& Shapson, S. M. (1987). English reading skills of French immersion students in kindergarten and grades 1 and 2. Reading Research Quarterly, 22(2), 135-159.
Kerkhoff, A., \& Vallen, T. (1985). Culture biases in second language testing for children. In G. Extra \& T. Valle (Eds.), Ethnic minorities and Dutch as a second language (pp. 133145). Dordrecht, The Netherlands: Foris.

Khomsi, A. (1990). Épreuve d'évaluation de la compétence en lecture: Lecture de mots et compréhension. Paris: Les Editions du Centre de Psychologie Appliquée.
Khomsi, A. (1997). Evaluation des compétences scolaires au Cycle des Apprentissages Fondamentaux (ECS-II). Paris: Les Editions du Centre de Psychologie Appliquée.
Khomsi, A. (1998). Évaluation des compétences scolaires au Cycle des Approfondissements (ECS-III). Paris: Les Editions du Centre de Psychologie Appliquée.
Khomsi, A. (1999). Épreuve d'évaluation de la compétence en lecture: Lecture de mots et compréhension (Rév. ed.). Paris: Les Editions de Centre de Psychologie Appliquée.
Khomsi, A. (February 19, 2007). Épreuve de la compétence en lecture: Lecture de mots et compréhension. In I. Denizot, Research Proposal (Ed.). Vancouver, British Columbia, Canada: The University of British Columbia.
Kintsch, W. (1998a). Comprehension: A framework for cognition. Cambridge, England: Cambridge University Press.
Kintsch, W. (1998b). Comprehension: A paradigm for cognition. Cambridge, England: Cambridge University Press.
Kintsch, W., \& Greene, E. (1978). The role of culture-specific schemata in the comprehension and recall of stories. Discourse Processes, 1(1), 1-13.
Kintsch, W., Kozminsky, E., Streby, W. J., McKoon, G., \& Keenan, J. M. (1975).
Comprehension and recall of text as a function of content variables. Journal of Verbal Learning and Verbal Behavior, 14(2), 196-214.
Kintsch, W., \& van Dijk, T. A. (1978). Toward a model of text comprehension and production. Psychological Review, 85(5), 363-394.
Koda, K. (2005). Insights into second language reading: A cross-linguistic approach. Cambridge, England: Cambridge University Press.
Kramsch, C. (1991). Culture in language learning: A view from the States. In K. de Bot, R. B. Ginsberg \& C. Kramsch (Eds.), Foreign language research in cross-cultural perspective (pp. 217-240). Amsterdam: John Benjamins.
Kramsch, C. (1993). Context and culture in language teaching. Oxford, England: Oxford University Press.

Kramsch, C. (2003). Teaching culture along the faultine. In D. L. Lange \& R. M. Paige (Eds.), Culture as the core: Perspectives in second language education (pp. 19-35). Greenwich, CT: Information Age Publishing.
Kucera, H., \& Francis, W. (1967). Computational analysis of present-day American English. Providence, RI: Brown University Press.
LaBerge, D., \& Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. Cognitive Psychology, 6(2), 293-323.
Lafrance, A. C., \& Gottardo, A. (2005). A longitudinal study of phonological processing skills and reading in bilingual children. Applied Psycholinguistics, 26(4), 559-578.
Laufer, B. (1989). What percentage of text-lexis is essential for comprehension? In C. Lauren \& M. Nordman (Eds.), Special language: From humans thinking to thinking machines (pp. 316-323). Philadelphia: Multilingual Matters.
Laufer, B. (2003). Vocabulary acquisition in a second language: Do learners really acquire most vocabulary by reading? Some empirical evidence. The Canadian Modern Language Review/La Revue canadienne des langues vivantes, 59(4), 567-587.
Laufer, B., \& Yano, Y. (2001). Understanding unfamiliar words in a text: Do L2 learners understand how much they don't understand? Reading in a Foreign Language, 13(2), 549-566.
Leach, J. M., Scarborough, H. S., \& Rescorla, L. (2003). Late-emerging reading disabilities. Journal of Educational Psychology, 95(2), 211-224.
Lee, J. F. (1986a). Background knowledge and L2 reading. The Modern Language Journal, 70(4), 350-354.
Lee, J. F. (1986b). On the use of the recall task to measure L2 reading comprehension. Studies in Second Language Acquisition, 8(2), 201-211.
Lee, J. F., \& Riley, G. L. (1990). The effect of prereading, rhetorically-oriented frameworks on the recall of two structurally different expository texts. Studies in Second Language Acquisition, 12(1), 25-41.
Lefrançois, P., \& Armand, F. (2003). The role of phonological and syntactic awareness in second-language reading: The case of Spanish-speaking learners of French. Reading and Writing: An Interdisciplinary Journal, 16(3), 219-246.
LeLoup, J. W. (1993). The effect of interest level in selected texts topics on second language reading comprehension. Dissertation Abstracts International, 54, 1709-A.
Leong, C. K. (1984). Cognitive processing, language awareness, and reading in grade 2 and grade 4 children. Contemporary Educational Psychology, 9(4), 369-383.
Lesaux, N. K., Lipka, O., \& Siegel, L. S. (2006). Investigating cognitive and linguistic abilities that influence the reading comprehension skills of children from diverse linguistic backgrounds. Reading and Writing, 19(1), 99-131.
Lesaux, N. K., Rupp, A. A., \& Siegel, L. S. (2007). Growth in reading skills of children from diverse linguistic backgrounds: Findings from a 5-year longitudinal study. Journal of Educational Psychology, 99(4), 821-834.
Lesaux, N. K., \& Siegel, L. S. (2003). The development of reading in children who speak English as a second language. Developmental Psychology, 39(6), 1005-1019.
Liberman, I. Y., Shankweiler, D. P., Fischer, F. W., \& Carter, B. (1974). Explicit syllable and phoneme segmentation in the young child. Journal of Experimental Child Psychology, 18(2), 201-212.
Lin, Z. (2002). Discovering EFL learners' perception of prior knowledge and its roles in reading comprehension. Journal of Research in Reading, 25(2), 172-190.

Lundberg, I., Frost, J., \& Peterson, O. P. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. Reading Research Quarterly, 23(3), 263284.

Lyster, R. (2007). Learning and teaching languages through content: A counterbalanced approach. Philadelphia: Johns Benjamins Publishing.
Mahony, D., Singson, M., \& Mann, V. (2000). Reading ability and sensitivity to moprhological relations. Reading and Writing: An Interdisciplinary Journal, 12(3), 191-218.
Malik, A. A. (1990). A psycholinguistic analysis of the reading behavior of EFL-proficient readers using culturally familiar and culturally non-familiar expository texts. American Educational Research Journal, 27(1), 205-223.
Mann, V. A. (1993). Phoneme awareness and future reading ability. Journal of Learning Disabilities, 26(4), 259-269.
Maria, K. (1990). Reading comprehension: Instruction, issues and strategies. Parkton, MD: York Press.
McBride-Chang, C., Cho, J.-R., Liu, H., Wagner, R. K., Shu, H., Zhou, A., et al. (2005). Changing models across cultures: Associations of phonological awareness and morphological structure awareness with vocabulary and word recognition in second graders from Beijing, Hong Kong, Korean, and the United States. Journal of Experimental Child Psychology, 92(2), 140-160.
McBride-Chang, C., Shu, H., Zhou, A., Wat, C. P., \& Wagner, R. K. (2003). Morphological awareness uniquely predicts young children's Chinese character recognition. Journal of Educational Psychology, 95(4), 743-751.
McNamara, D. S., Kintsch, E., Songer, N. B., \& Kintsch, W. (1996). Are good texts always better? Interactions of text coherence, background knowledge, and levels of understanding in learning from text. Cognition and Instruction, 14(3), 1-43.
Merriam, S. B. (1998). Qualitative research and case study applications in education (2nd ed.). San Francisco: Jossey-Bass.
Meyer, B. J. F. (1975a). The organization of prose and its effects on memory. Amsterdam: North-Holland Publishing.
Meyer, B. J. F. (1975b). The structure of prose and its effects on memory. Amsterdam: NorthHolland Publishing.
Miller, W. L., \& Crabtree, B. F. (2004). Depth interviewing. In S. N. Hesse-Biber \& P. Leavy (Eds.), Approaches to qualitative research: A reader on theory and practice (pp. 185202). Oxford, England: Oxford University Press.

MLA Ad Hoc Committee on Foreign Languages. (2007). Foreign languages and higher education: New structure for a changed world. New York: The Modern Language Association of America.
Mohammed, M. A. H., \& Swales, J. M. (1984). Factors affecting the successful reading of technical instructions. Reading in a Foreign Language, 2(2), 206-217.
Molzan, J., \& Lloyd, S. (2001). Le manuel phonique. Essex, England: Jolly Learning.
Mousty, P., Leybaert, J., Alegria, J., Content, A., \& Morais, J. (1994). BÉLÉC: Batterie d'évaluation du langage écrit et de ses troubles. In J. Grégoire \& B. Piérart (Eds.), Évaluer les troubles de la lecture: Les nouveaux modèles théoriques et leurs implications diagnostiques (pp. 127-145). Bruxelles, Belgique: DeBoeck Université.
Muter, V., Hulme, C., Snowling, M. J., \& Stevenson, J. (2004). Phonemes, rimes, vocabulary, and grammatical skills as foundations of early reading development: Evidence from a longitudinal study. Developmental Psychology, 40(5), 665-681.

Muter, V., \& Snowling, M. J. (1998). Concurrent and longitudinal predictors of reading: The role of metalinguistic and short-term memory skills. Reading Research Quarterly, 33(3), 320337.

Nagy, W. E. (2005). Why vocabulary instruction needs to be long-term and comprehensive. In E. H. Hiebert \& M. L. Kamil (Eds.), Teaching and learning vocabulary: Bringing research to practice (pp. 27-44). Mahwah, NJ: Erlbaum.
Nagy, W. E., Herman, P. A., \& Anderson, R. C. (1985). Learning words from context. Reading Research Quarterly, 20(2), 233-253.
Naslund, J. C., \& Schneider, W. (1996). Kindergarten letter knowledge, phonological skills, and memory processes: Relative effects on early literacy. Journal of Experimental Child Psychology, 62(1), 30-59.
Nassaji, H. (2007). Schema theory and knowledge-based process in second language reading comprehension: A need for alternative perspectives. Language Learning, 57(1), 79-113.
Nation, I. S. P. (2001). Learning vocabulary in another language. Cambridge, England: Cambridge University Press.
National Reading Panel. (2000). Teaching children to read: An evidence-based assessment of the scientific research literature and its implications for reading instruction (Report of the subgroups). Washington, DC: U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health and the National Institute of Child Health and Human Development.
National Standards in Foreign Language Education Project. (1996). Standards for foreign language learning in the 21st century. Yoners, NY: National Standards in Foreign Language Education Project.
Nolte, K. F. (1937). Simplification of vocabulary and comprehension in reading. The Elementary School Journal, 14, 119-124.
Nunan, D. (1985). Content familiarity and the perception of textual relationships in second language reading. RELC Journal, 16(1), 43-51.
Oakhill, J. V., Cain, K., \& Bryant, P. E. (2003). Dissociation of a single-word reading and text comprehension skills. Language and Cognitive Processes, 18(4), 443-468.
OECD. (2007). Futures for schooling. Retrieved November, 2008, from http://www.oecd.org/document/42/0,2340,en_2649 34521_35413930_1 1 1 1, 1,00.html
Olah, E. (1984). How special is special English? In A. K. Pugh \& J. M. Ulijn (Eds.), Reading for professional purposes: Studies and practices in native and foreign languages (pp. 223226). London: Heinemann Educational Books.

Omaggio, A. C. (1979). Pictures and second language comprehension: Do they help? Foreign Language Annals, 12(2), 107-116.
Parry, K. J. (1987). Reading in a second culture. In J. Devine, P. L. Carrell \& D. E. Eskey (Eds.), Research in reading in English as a second language (pp. 59-70). Washington, DC: TESOL.
Pearson, P. D., Hansen, J., \& Gordon, C. (1979). The effect of background knowledge on young children's comprehension of explicit and implicit information. Journal of Reading Behavior, ll(3), 201-209.
Pearson, P. D., \& Johnson, D. D. (1978). Teaching reading comprehension. New York: Holt, Rinehart and Winston.
Perfetti, C. A. (1985). Reading ability. New York: Oxford University Press.
Perfetti, C. A., Beck, I., Bell, L. C., \& Hughes, C. (1987). Phonemic knowledge and learning to read are reciprocal. Merrill-Palmer Quarterly, 33(3), 283-319.

Perkins, K., \& Angelis, P. J. (1985). Schematic concept formation: Concurrent validity for attained English as a second language reading comprehension. Language Learning, 35(2), 269-283.
Perragaux, C. (1994). Les enfants à deux voix. Bern, Suisse: Peter Lang.
Piaget, J. (1926). The language and thought of the child. New York: Harcourt, Brace.
Plaza, M., \& Cohen, H. (2003). The interaction between phonological processing, syntactic awareness, and naming speed in the reading and spelling performance of first-grade children. Brain and Cognition, 53(2), 287-292.
Pratt, A. C., \& Brady, S. (1988). Relation of phonological awareness to reading disability in children and adults. Journal of Educational Psychology, 80(3), 319-323.
Pritchard, R. (1990). The effects of cultural schemata on reading processing strategies. Reading Research Quarterly, 25(4), 273-295.
Pulido, D. (2003). Modeling the role of second language proficiency and topic familiarity in second language incidental vocabulary acquisition through reading. Language Learning, 53(2), 233-284.
Pulido, D. (2004). The relationship between text comprehension and second language incidental vocabulary acquisition: A matter of topic familiarity? Language Learning, 54(3), 469523.

Pulido, D. (2007a). The effects of topic familiarity and passage sight vocabulary on L2 lexical inferencing. Applied Linguistics, 28(1), 66-86.
Pulido, D. (2007b). The relationship between text comprehension and second language incidental vocabulary acquisition: A matter of topic familiarity? Language Learning, 57(1), 155199.

QSR. (2006). NVivo 7. Melbourne, Australia: QSR International Pty Ltd.
Raymond, P. M. (1993). The effects of structure strategy training on the recall of expository prose for university students reading French as a second language. The Modern Language Journal, 77(7), 445-458.
Rego, L. L. B., \& Bryant, P. E. (1993). The connection between phonological, syntactic and semantic skills and children's reading and spelling. European Journal of Psychology of Education, 8(3), 235-246.
Ridgway, T. (1997). Thresholds on the background knowledge effect in foreign language reading. Reading in a Foreign Language, 11(1), 151-168.
Rosenblatt, L. M. (1994). The transactional theory of reading and writing. In R. R. Ruddell \& N. J. Unrau (Eds.), Theoretical models and processes of reading (pp. 1363-1398). Newark, DE: International Reading Association.
Rosner, J. (1972). The Auditory Analysis Test. Pittsburgh, PA: Learning Resource and Development Centre, University of Pittsburgh.
Rosner, J., \& Simon, D. P. (1971). The auditory analysis test: An initial report. Journal of Learning Disabilities, 4(7), 384-392.
Rubin, H., \& Turner, A. (1989). Linguistic awareness skills in grade one children in a French immersion setting. Reading and Writing: An Interdisciplinary Journal, 1(1), 73-86.
Rumelhart, D. E. (1977). Toward an interactive model of reading. In S. Dornic (Ed.), Attention and performance VI (pp. 573-603). Hillsdale, NJ: Erlbaum.
Rumelhart, D. E. (1980). Schemata: The building blocks of cognition. In R. J. Spiro, B. C. Bruce \& W. F. Brewer (Eds.), Theoretical issues in reading comprehension (pp. 33-58). Hillsdale, NJ: Erlbaum.

Rumelhart, D. E., \& Ortony, A. (1977). The representation of knowledge in memory. In R. C. Anderson, R. J. Spiro \& W. E. Montague (Eds.), Schooling and the acquisition of knowledge (pp. 99-135). Hillsdale, NJ: Erlbaum.
Ryan, G. W., \& Bernard, H. R. (2000). Data management and analysis methods. In N. K. Denzin \& Y. S. Lincoln (Eds.), Handbook of qualitative research (pp. 445-479). Thousand Oaks, CA: Sage Publications.
Ryder, R. J., \& Hughes, M. (1985). The effect on text comprehension of word frequency. Journal of Educational Research, 78(5), 286-291.
Schank, R. C., \& Abelson, R. P. (1977). Scripts, plans, goals and understanding. Hillsdale, NJ: Erlbaum.
Schatschneider, C., Fletcher, J. M., Francis, D. J., Carlson, C. D., \& Foorman, B. R. (2004). Kindergarten prediction of reading skills: A longitudinal comparative analysis. Journal of Educational Psychology, 96(2), 265-282.
Schatschneider, C., Harrell, E. R., \& Buck, J. (2007). An individual-differences approach to the study of reading comprehension. New York: Guilford Press.
Seigneuric, A., \& Ehrlich, M.-F. (2005). Contribution of working memory capacity to children's reading comprehension: A longitudinal investigation. Reading and Writing, 18(7-9), 617656.

Selinker, L. (1991). Along the way: Interlanguage systems in second language acquisition. In L. M. Malavé \& G. Duquette (Eds.), Language, culture and cognition: A collection of studies in first and second language acquisition (pp. 23-35). Clevedon, England: Multilingual Matters.
Share, D. L., Jorm, A. F., Maclean, R., \& Matthews, R. (1984). Sources of individual differences in reading acquisition. Journal of Educational Psychology, 76(6), 1309-1324.
Share, D. L., \& Stanovich, K. E. (1995). Cognitive processes in early reading development: Accommodating individual differences into a model of acquisition. In J. S. Carlson (Ed.), Issues in education: Contributions from psychology (Vol. 1, pp. 1-57). Greenwich, CT: JAI Press.
Sharifian, F. (2003). On cultural conceptualizations. Journal of Cognition and Culture, 3(3), 187-207.
Shaywitz, S. E. (1996). Dyslexia. Scientific American, 275(5), 98-104.
Shohamy, E. (1982). Affective considerations in language testing. The Modern Language Journal, 66(1), 3-17.
Shohamy, E. (1984). Does the testing method make a difference? The case of reading comprehension. Language Testing, 1(2), 147-170.
Shohamy, E. (2001). The power of tests: A critical perspective on the uses of language tests. New York: Longman.
Siegel, L. S. (2002). Bilingualism and reading. In L. T. Verhoeven, C. Elbro \& P. Reitsma (Eds.), Precursors of functional literacy (pp. 287-302). Amsterdam: J. Benjamins.
Siegel, L. S., \& Ryan, E. B. (1988). Development of grammatical-sensitivity, phonological, and short-term memory skills in normally achieving and learning disabled children. Developmental Psychology, 24(1), 28-37.
Siegel, L. S., \& Ryan, E. B. (1989). The development of working memory in normally achieving and subtypes of learning disabled children. Child Development, 60(4), 973-980.
Snowling, M. J. (1981). Phonemic deficits in developmental dyslexia. Psychological Research, 43(2), 219-234.

So, D., \& Siegel, L. S. (1997). Learning to read Chinese: Semantic, syntactic, phonological and working memory skills in normally achieving and poor Chinese readers. Reading and Writing: An Interdisciplinary Journal, 9(1), 1-21.
Sones, É., Goulet, F., \& Christen, M. (2007). Activités d'éveil à la conscience phonologique. Vancouver, British Columbia, Canada: École Bilingue.
Sprenger-Charolles, L., \& Siegel, L. S. (1997). A longitudinal study of the effects of syllabic structure on the development of reading and spelling skills in French. Applied Psycholinguistics, 18(4), 485-505.
Sprenger-Charolles, L., Siegel, L. S., \& Bonnet, P. (1998). Reading and spelling acquisition in French: The role of phonological mediation and orthographic factors. Journal of Experimental Child Psychology, 68(2), 134-165.
St. Pierre, L., Laing, D., \& Morton, L. L. (1995). The influence of French on the English spelling of children in early French immersion. The Canadian Modern Language Review/La Revue canadienne des langues vivantes, 51(2), 330-347.
Stahl, S. A., \& Fairbanks, M. M. (1986). The effects of vocabulary instruction: A model-based meta-analysis. Review of Educational Research, 56(1), 72-110.
Stanovich, K. E. (1980). Toward an interactive-compensatory model of individual differences in the development of reading fluency. Reading Research Quarterly, 16(1), 32-71.
Stanovich, K. E. (1986). Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. Reading Research Quarterly, 21(4), 360-406.
Stanovich, K. E. (1988). Explaining the difference between the dyslexic and the garden-variety poor reader: The phonological-core variable-difference model. Journal of Learning Disabilities, 21(10), 590-604.
Stanovich, K. E., Cunningham, A. E., \& Cramer, B. B. (1984). Assessing phonological awareness in kindergarten children: Issues of task comparability. Journal of Experimental Child Psychology, 38(2), 175-190.
Stanovich, K. E., \& Siegel, L. S. (1994). Phenotypic performance profile of children with reading disabilities: A regression-based test of the phonological-core variable-difference model. Journal of Educational Psychology, 86(1), 24-53.
Stanovich, K. E., West, R., F., \& Cunningham, A. E. (1991). Beyond phonological processes: Print exposure and orthographic processing. In S. A. Brady \& D. E. Shankweiler (Eds.), Phonological processes in literacy: A tribute to Isabelle Y. Liberman (pp. 219-235). Hillsdale, NJ: Lawrence Erlbaum Associates.
Statistics Canada. (2006a). Census family income. Retrieved January 16, 2007, from http://www.statcan.gc.ca/daily-quotidien/060525/dq060525c-eng.htm
Statistics Canada. (2006b). Census tract profile. Retrieved January 12, 2007, from http://www12.statcan.ca/english/census06/data/profiles/ct/ctdata.cfm?Lang=E\&CTCOD $\mathrm{E}=2380 \& \mathrm{CACODE}=933 \& \mathrm{PRCODE}=59 \& \mathrm{PC}=\mathrm{V} 5 \mathrm{~B} 4 \mathrm{~K} 7$
Steffensen, M. S., Goetz, E. T., \& Cheng, X. (1999). A cross-linguistic perspective on imagery and affect in reading: Dual coding in Chinese and English. Journal of Literacy Research, 31(3), 293-319.
Steffensen, M. S., Joag-Dev, C., \& Anderson, R. C. (1979). A cross-cultural perspective on reading comprehension. Reading Research Quarterly, 15(1), 10-29.
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, Department of Education, Toronto, Ontario, Canada.

Stevens, K. C. (1980). The effect of background knowledge on the reading comprehension of ninth graders. Journal of Reading Behaviour, 12(2), 151-154.
Stevens, K. C. (1982). Can we improve reading by teaching background information? Journal of Reading, 25(4), 326-329.
Stuart, M., \& Masterson, J. (1992). Patterns of reading and spelling in 10-year-old children related to prereading phonological abilities. Journal of Experimental Child Psychology, 54(2), 168-187.
Swan, D., \& Goswami, U. (1997). Phonological awareness deficit in developmental dyslexia and the phonological representations hypothesis. Journal of Experimental Child Psychology, 66(1), 18-41.
Swanson, H. L. (1993). Individual differences in working memory: A model testing and subgroup analyses of learning-disabled and skilled readers. Intelligence, 17(3), 285-332.
Swanson, H. L. (1999). Reading comprehension and working memory in learning-disabled readers: Is the phonological loop more important than the executive system. Journal of Experimental Child Psychology, 72(1), 1-31.
Sökmen, A. (1997). Current trends in teaching second language vocabulary. In N. Schmitt \& M. McCarthy (Eds.), Vocabulary: Description, acquisition and pedagogy (pp. 237-257). Cambridge, England: Cambridge University Press.
Tabachnick, B. G., \& Fidell, L. S. (2001). Using multivariate statistics (4th ed.). New York: Allyn and Bacon.
Tang, Y. (2006). Beyond behavior: Goals of cultural learning in the second language classroom. The Modern Language Journal, 90(1), 86-99.
Tashakkori, A., \& Teddlie, C. (1998). Mixed methodology: Combining qualitative and quantitative approaches. Thousand Oaks, CA: Sage Publications.
Taylor, S. J., \& Bogden, R. (1984). Introduction to qualitative research: The search for meaning (2nd ed.). New York: John Wiley.
Thomas, D. R. (1992). Interpreting discriminant functions: A data analytic approach. Multivariate Behavorial Research, 27(3), 335-362.
Thomas, D. R., Hughes, E., \& Zumbo, B. D. (1998). On variable importance in linear regression. Social Indicators Research: An International and Interdisciplinary Journal for Quality-of-Life Measurement, 45(1-3), 253-275.
Tingley, P. A., Dore, K. A., Lopez, A., Parsons, H., Campbell, E., Kay-Raining Bird, E., et al. (2004). A comparison of phonological awareness skills in early French immersion and English children. Journal of Psycholinguistic Research, 33(3), 263-287.
Torgesen, J. K., \& Burgess, S. R. (1998). Consistency of reading-related phonological processes throughout early childhood: Evidence from longitudinal, correlational and instructional studies. In J. L. Metsala \& L. C. Ehri (Eds.), Word recognition in beginning literacy (pp. 161-188). Mahwah, NJ: Erlbaum.
Trabasso, T. (1981). On the making of inferences during reading and their assessment. In J. T. Guthrie (Ed.), Comprehension and teaching: Research reviews (pp. 56-76). Newark, DE: International Reading Association.
Treiman, R., \& Bourassa, D. C. (2000). The development of spelling skills. Topics in Language Disorders, 20(3), 1-18.
Treiman, R., \& Zukowski, A. (1991). Levels of phonological awareness. In S. A. Brady \& D. P. Shankweiler (Eds.), Phonological processes in literacy: A tribute to Isabelle Y. Liberman (pp. 67-83). Hillsdale, NJ: Erlbaum.

Treiman, R., \& Zukowski, A. (1996). Children's sensitivity to syllables, onsets, rimes, and phonemes. Journal of Experimental Child Psychology, 61(3), 193-215.
Troike, R. C. (1978). Research evidence for the effectiveness of bilingual education. NABE Journal, 3(1), 13-24.
Tulving, E. (1972). Episodic and semantic memory. In E. Tulving \& W. Donaldson (Eds.), Organizations of memory (pp. 381-403). New York: Academic Press.
Tunmer, W. E. (1989). The role of language-related factors in reading disability. In D. P. Shankweiler \& I. Y. Liberman (Eds.), Phonology and reading disability: Solving the puzzle (pp. 144-168). New York: Springer-Verlag.
Tunmer, W. E., \& Bowey, J. A. (1984). Metalinguistic awareness and reading acquisition. In W. E. Tunmer, J. A. Bowey, C. Pratt \& M. L. Herriman (Eds.), Metalinguistic awareness in children: Theory, research, and implications. Berlin: Springer-Verlag.
Tunmer, W. E., Herriman, M. L., \& Nesdale, A. R. (1988). Metalinguistic abilities and beginning reading. Reading Research Quarterly, 23(2), 134-158.
Tunmer, W. E., Nesdale, A. R., \& Wright, A. D. (1987). Syntactic awareness and reading acquisition. British Journal of Developmental Psychology, 5(1), 25-34.
Umberger, F. G. (1985). Peabody Picture Vocabulary Test-Revised. In D. J. Keyser \& C. Sweetland (Eds.), Test critiques (Vol. 3, pp. 489-495). Kansas City, MS: Westport.
Urquhart, A. H., \& Weir, C. J. (1998). Reading in a second language: Process, product and practice (1st ed.). London: Longman.
Vakalisa, N. C. G. (1995). African science teachers' perceptions on how in-service education influences classroom teaching: A case study. Unpublished dissertation, Ohio State University, Columbus, OH.
Vellutino, F. R., \& Scanlon, D. M. (1987). Phonological coding, phonological awareness, and reading ability: Evidence from a longitudinal and experimental study. Merrill-Palmer Quarterly, 33(3), 321-363.
Vygotsky, L. S. (1934). Thought and language (E. Hanfmann \& G. Vakar, Trans.). Cambridge, MA: The MIT Press.
Vygotsky, L. S. (1978). Mind in society: The development of higher psychological processes. Cambridge, MA: Harvard University Press.
Wagner, R. K., \& Torgesen, J. K. (1987). The nature of phonological processing and its causal role in the acquisition of reading skills. Psychological Bulletin, 101(2), 192-212.
Wagner, R. K., Torgesen, J. K., \& Rashotte, C. A. (1994). Development of reading-related phonological processing abilities: New evidence of a bidirectional causality from a latent variable longitudinal study. Developmental Psychology, 30(1), 73-87.
Wagner, R. K., Torgesen, J. K., Rashotte, C. A., Hecht, S. A., Barker, T. A., Burgess, S. R., et al. (1997). Changing relations between phonological processing abilities and word-level reading as children develop from beginning to skilled readers: A 5-year longitudinal study. Developmental Psychology, 33(3), 468-479.
Walton, C. M. (1997). The development of phonological awareness and spelling competence in beginning spellers. Vancouver, Canada: University of British Columbia.
Wang, M., Cheng, C., \& Chen, S.-W. (2006). Contribution of morphological awareness to Chinese-English biliteracy acquisition. Journal of Educational Psychology, 98(3), 542553.

Wascowitz, J., Apel, K., Masterson, J. J., \& Withney, A. (2004). SPELL-Links to reading and writing. Evanston, IL: Learning by Design.

Weber, R. (1991). Linguistic diversity and reading in American society. In R. Barr, M. L. Kamil, P. B. Mosenthal \& P. D. Pearson (Eds.), Handbook of reading research (pp. 97-119). New York: Longman.
Webster, J. B., Deuling, C., \& Frizzell, L. (2000). Developing skills in phonological awareness. Whitehorse, Yukon, Canada: PowerEd.
Wechsler, D. (1974). WISC-R (Wechsler Intelligence Scale for Children - Revised). New York: The Psychological Corporation.
Weir, C. J., Huizhong, Y., \& Yan, J. (2000). An empirical investigation of the componentiality of L2 reading in English for academic purposes. In Studies in Language Testing 12. Cambridge, England: Cambridge University Press.
Wiig, E. H. (1984). Review of the Peabody Picture Vocabulary Test-Revised. In J. V. J. Mitchell (Ed.), The ninth mental measurement yearbook (pp. 926-927). Lincoln, NB: University of Nebraska Press.
Wilkinson, G. S. (1993). The Wide Range Achievement Test 3. Wilmington, DE: Jastak Associates.
Williams, J. P., Hall, K. M., Lauer, K. D., Stafford, K. B., DeSisto, L. A., \& deCani, J. S. (2005). Expository text comprehension in the primary grade classroom. Journal of Educational Psychology, 97(4), 538-550.
Willig, A. C. (1985). A meta-analysis of selected studies on the effectiveness of bilingual education. Review of Educational Research, 55(3), 269-318.
Wittock, M. C., Marks, C., \& Doctorow, M. (1975). Generative processes in reading comprehension. Journal of Educational Psychology, 67(4), 484-489.
Wolcott, H. F. (1994). Description analysis and interpretation in qualitative inquiry. In H. F. Wolcott (Ed.), Transforming qualitative data: Description, analysis and interpretation (pp. 9-54). Thousand Oaks, CA: Sage Publications.
Wolff, D. (1987). Some assumptions about second language comprehension. Studies in Second Language Acquisition, 9(3), 307-326.
Woodcock, R. W. (1987). Woodcock Reading Mastery Tests-Revised. Circle Pines, MN: American Guidance Services.
Wormeli, C. T., \& Ardanaz, N. (1987). The Canada F.I.A.T. Vancouver, Canada: University of British Columbia, Faculty of Education, Education Clinic.
Yuet, C., \& Chan, H. (2003). Cultural content and reading proficiency: A comparison of Mainland Chinese and Hong Kong learners of language. Language, Culture and Curriculum, 16(1), 60-69.
Yuill, N. (1998). Reading and riddling: The role of riddle appreciation in understanding and improving poor text comprehension in children. Cahiers de Psychologie Cognitive, 17(2), 313-342.
Zarate, G., Lévy, D., \& Kramsch, C. (Eds.). (2007). Précis du plurilinguisme et du pluriculturalisme. Paris: Éditions des archives contemporaines.
Ziarko, H., \& Mélançon, J. (1999). De la maternelle à la première année: Évolution des habiletés métalinguistiques et compréhension de l'écrit. The Canadian Journal of Research in Early Childhood Education, 8(1), 37-64.
Ziegler, J. C., Perry, C., \& Coltheart, M. (2003). Speed of lexical and nonlexical processing in French: The case of the regularity effect. Psychonomic Bulletin \& Review, 10(4), 947953.

Zuck, L. V., \& Zuck, J. G. (1984). The main idea: Specialist and non-specialist judgments. In A. K. Pugh \& J. M. Ulijn (Eds.), Reading for professional purposes: Studies and practices in native and foreign languages (pp. 130-135). London: Heinemann Educational Books.

APPENDICES

# Appendix A UBC Research Ethics Certificate 

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## CERTIFICATE OF APPROVAL - MINIMAL RISK

|  | UAC GREB NUMAER: <br> 407-00509 |
| :---: | :---: |
| INSTITUTION(S) WHERE RESEARCH WILL BE CARRIED OUT: |  |
|  | S |
| CO-INVESTIGATOR(S): NIA |  |
| SPONSORING AGENCIES: WiA |  |
| PROSECT TITLE: <br> The Role al Cuitural Background Knowledge in Grade Three Fiench Immerson Students Reading Compretmensiun |  |
| CERTIFICATE EXPIRY DATE: May 3, 2008 |  |
| DOCUMENTS INCLUDED IN THIS APPROVAL: | DATE APPROVED: May 3. 2007 |
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The applicalion for ethical revien and the ducurent(s) listed atuove have been reviewed and the procedures wete fount to the accoptation on athirat grounds for rosearch involung human subucts

Approval is issued on behalf of the Benswioural Resoaren Ethics Board and signed electronically by ane of the following:

# Appendix B Letter to Parents 

## THE UNIVERSITY OF BRITISH COLUMBIA



April 27, 2007

## Informed Consent Form

## The Role of Cultural Background Knowledge in Grade 3 French Immersion Students' Reading Comprehension

Investigator: The principal investigator is Dr. Monique Bournot-Trites, Department of Language and Literacy Education and this is a research for Isabelle Denizot's graduate degree, Department of Language and Literacy Education.

Purpose: The purpose of this study is to understand how children develop the skills necessary for successful reading comprehension in French, in French immersion. All of the children in your child's class are being asked to participate in an effort to improve reading achievement in the school.

Study Procedures: The children will be pulled out of class and seen individually in May for about 60 minutes each. The tasks that are administered will measure language skills (phonological and syntactic awareness, vocabulary, spelling, memory, cultural background knowledge) and word reading and reading comprehension. The tasks will be in French.

Confidentiality: The results will be discussed with your child's teacher only with your consent and after you have been informed first of the results and will not be available to anyone else without your written consent. You will also be able to access these results by contacting the school. When you give your consent, you are also asked whether or not you consent that your child's results be shared with the school and your child's teacher. All data will be placed in a locked file cabinet at UBC. Participants will not be identified in reports of the completed study. Your child will be assigned a code number and the code numbers will be used in the analysis. No specific child will be referred to by name of identified in any way in the report of the results.

Contact for concerns about the rights of your child: You or your child may refuse participation in this project or withdraw during the project without any consequence to your child's class standing. Your participation and that of your child is entirely voluntary and you or your child may refuse to participate or withdraw from the study at any time, even after signing this consent form. Refusing to participate or withdrawal will not jeopardize your child's education. If you give your permission for your child's participation, I will still obtain his or her assent before proceeding to any evaluation. This will consist of verbal process where your child will be told about the study and the alternatives and ask if he or she agrees to participate. If you have any concerns about your child's treatment or rights as a research subject, you may contact Isabelle Denizot or Dr. Monique Bournot-Trites by e-mail at idenizot@interchange.ubc.ca and monique.bournot-trites@ubc.ca respectively, or the Research Subject Information Line in the UBC Office of Research Services.

I am writing to request your permission for your son or daughter to participate in this study entitled: "The Role of Cultural Background Knowledge in Grade 3 French Immersion Students' Reading Comprehension". On the next page, you will find the statement of informed consent to be signed by you and sent back to your school as soon as possible, whether or not you wish your child to participate in the project. The second copy is for you to keep.

Thank you for your participation in this study.

Isabelle Denizot, BA, BEd, MA
PhD Student

Monique Bournot-Trites, PhD
Assistant Professor Director of Modern Language Education

## Statement of Informed Consent (copy to keep)

Title of the project: "The Role of Cultural Background Knowledge in Grade 3 French Immersion Students' Reading Comprehension".
Researcher: The principal investigator is Dr. Monique Bournot-Trites, Department of Language and Literacy Education and this is a research for Isabelle Denizot's graduate degree, Department of Language and Literacy Education.

## Please fill out the information below.

Be sure to keep p. 1 to 2 for your own records and to return a signed copy of page 3 (Statement of Informed Consent) to the office of your school by next day or as soon as possible.

I have read and understand the attached letter regarding the project entitled "The Role of Cultural Background Knowledge in Grade 3 French Immersion Students' Reading Comprehension". I have kept copies of both the letter describing the project and a permission form (Statement of Informed Consent).
'I consent / I do not consent (circle one) to my child's participation in this study.'
'I consent / I do not consent (circle one) to the sharing of the results of my child's with his/her teacher.'

Printed name of the child

Printed grade and teacher's name of your child

Parent's or Guardian's Signature Date

Printed name of the parent or guardian signing above

## Statement of Informed Consent (copy to send back to the school)

Title of the project: "The Role of Cultural Background Knowledge in Grade 3 French Immersion Students' Reading Comprehension".
Researcher: The principal investigator is Dr. Monique Bournot-Trites, Department of Language and Literacy Education and this is a research for Isabelle Denizot's graduate degree, Department of Language and Literacy Education.

## Please fill out the information below.

Be sure to keep p. 1 to 2 for your own records and to return a signed copy of page 3 (Statement of Informed Consent) to the office of your school by next day or as soon as possible.

I have read and understand the attached letter regarding the project entitled "The Role of Cultural Background Knowledge in Grade 3 French Immersion Students' Reading Comprehension". I have kept copies of both the letter describing the project and a permission form (Statement of Informed Consent).
'I consent / I do not consent (circle one) to my child's participation in this study.'
'I consent / I do not consent (circle one) to the sharing of the results of my child's with his/her teacher.'

Printed name of the child

Printed grade and teacher's name of your child

Parent's or Guardian's Signature Date

Printed name of the parent or guardian signing above

## Statement of Student's Assent

Title of the project: "The Role of Cultural Background Knowledge in Grade 3 French Immersion Students' Reading Comprehension"
Researcher: The principal investigator is Dr. Monique Bournot-Trites, Department of Language and Literacy Education and this is a research for Isabelle Denizot's graduate degree, Department of Language and Literacy Education.

Please fill out the information below.

The teacher has explained to me what I was going to do and for what purpose. I understand the purpose of the activities that I am going to do and I agree to do them.
'I assent / I do not assent (circle one) to participate in this study.'

Printed name of the child

Child's Signature Date

## Appendix C Word Reading Task

## Word Identification Canada FIAT (Wormeli \& Ardanaz, 1987)

Base $=\mathbf{6}$ bonnes réponses consécutives - Plafond $=\mathbf{6}$ erreurs consécutives
CONSIGNES POUR LA TÂCHE DE LECTURE DE MOTS:
Examinateur: « Maintenant, tu vas voir des mots. Regarde chaque mot et dis-le à voix
haute. Prononce bien. »Si l'élève n'a pas dès le début 6 bonnes réponses, recommencer à 1'Item 1.

Commencez à l'Item 6 ('de') p. 7 du manuel Canada F.I.A.T. pour tous les enfants. Arrêtez après 6 erreurs consécutives.

## NOTATION:

Écrivez 1 devant le mot si la réponse est bonne et $\mathbf{0}$ si la réponse est fausse.
Niveau (Grade)
$1 \quad 1 . \quad \mathrm{a}$
_ 2. b
_ 3. c
_ $4 . \quad \mathrm{f}$

- $5 . \quad 1$

2 _ 6. de
_ 7. vite
_ 8. et
_ 9. tulipe
10. avec

There were 86 test items.
Total: $\qquad$ /86

## Appendix D Reading Comprehension of Isolated Sentences Task

Compréhension en lecture - LMC-R (Khomsi, 1999)

## CONSIGNES POUR LA TÂCHE DE COMPRÉHENSION EN LECTURE:

Examinateur: «On va jouer à montrer des images. Moi, je vais te présenter chaque fois 4 images et une étiquette sur laquelle il y a des phrases écrites. Toi, tu vas lire ce qu'il y a sur l'étiquette et me montrer l'image où il y a ce qui est écrit. Tu peux lire silencieusement dans ta tête, ou à voix haute, comme tu préfères: je n'ai pas besoin d'entendre comment tu lis, juste que tu me montres l'image qui va avec ce qui est écrit. » On utilise les planches d'entraînement 01 et 02.

Code des images

| 1 | 2 |
| :--- | :--- |
| 3 | 4 |

## ESSAIS:

Une fois la consigne donnée, on tourne à la planche d'entraînement 01 et l'on continue: Examinateur: «Là, quelle est l'image où il y a ce qui est écrit ? » L'élève doit montrer l'image 4 (le garçon court).
Si l'enfant montre la bonne image, l'examinateur dit: « Bravo ! » On tourne à la planche d'entraînement 02 .

Pour chacun des énoncés, une deuxième désignation sera immédiatement demandée en cas de première désignation erronée. Cette demande est formulée de façon implicite (il est indispensable de ne pas insister). Elle sera présentée comme suit:
Examinateur: «Regarde bien ce qui est écrit et montre-moi l'image où il y a ce qui est écrit. » Si l'enfant montre la bonne image, l'examinateur dit: «Bravo ! » On tourne à la planche d'entraînement 02.

Examinateur: «Maintenant, montre-moil l'image où il y a ce qui est écrit ? » L'élève doit montrer l'image 2 (le bol n'est pas cassé). Si l'enfant montre la bonne image, l'examinateur dit: «Bravo ! »

## TEST:

On utilise les planches 1 à 21.
Une fois que le sujet a bien compris, on tourne à la planche marquée pour le début de l'application, on tourne à la planche 1 en disant: «Très bien ! Maintenant nous allons regarder d'autres images. Tu peux lire à voix haute ou dans ta tête, comme tu préfères. »
En cas de désignation correcte, on passe à l'énoncé suivant. En cas de désignation erronée, on demande implicitement une deuxième désignation en disant: «Regarde bien ce qui est écrit et montre-moi l'image où il y a ce qui est écrit. » Ne rien dire d'autre, ne fournir aucune aide.
Quelque soit la deuxième désignation, on passe à l'énoncé suivant.

## NOTATION:

Deux tirets sont prévus pour noter les désignations des enfants (première et éventuellement, deuxième désignation) selon la catégorie de l'énoncé Ig1 - Ig2 et If1 - If2. Les images sont numérotées selon le code ci-contre et le numéro de l'image correspondant à la désignation correcte apparaît entre les deux tirets dans la feuille de passation.

Plusieurs cas de figures sont possibles:
a) L'enfant montre une seule image et c'est l'image correcte: on note le numéro de l'image sur le premier tiret.
b) L'enfant montre plusieurs images successivement: on note sur le premier tiret, l'ordre de la désignation (en utilisant le code proposé pour le numéro de l'image).
c) Si la dernière image montrée correspond à la désignation correcte, on la notera aussi avec le numéro de l'image après les chiffres correspondants aux désignations précédentes et on passera à l'énoncé suivant.
d) La notation de la deuxième désignation, quand elle est sollicitée, se fait dans les mêmes conditions que la première, sur le deuxième tiret. Quelque soit la deuxième désignation on passera à l'énoncé suivant. Lors de la deuxième passation, un certain nombre d'enfants produisent une désignation très rapidement, dès que l'examinateur commence à parler, sans se donner la peine de relire l'énoncé. On la notera par I pour 'Interruption'.

## Faites passer l'ensemble des 21 planches.

L'examinateur ne notera pas les autres indicateurs car ils seront déterminés par le chercheur selon les réponses données par l'enfant.

Pour le chercheur, trois autres indicateurs peuvent être calculés (encerclez celui qui s'applique, si nécessaire):
a) Le nombre d'autocorrections 'AC': nombre de désignation correctes en deuxième désignation.
b) Le nombre de persévérations ' $P$ ': nombre de désignation, identiques en première et deuxième présentation.
c) Le nombre de changements de désignation non adéquat 'CD': nombre de changements de désignation, en deuxième présentation, qui n'aboutissent pas à la désignation de l'image considérée comme « correcte ».

ESSAIS:

1. Le garçon court.
2. Le bol n'est pas cassé.

Ig1 Ig2
$\qquad$

TEST:

1. Les enfants mettront leurs chaussures.

Ig1 Ig2 If1 If2
2. La petite fille le regarde.
1 $\mathrm{AC}-\mathrm{P}-\mathrm{CD}$
3. Le monsieur va partir.
$-1-$
$\mathrm{AC}-\mathrm{P}-\mathrm{CD}$
$-3$
$\mathrm{AC}-\mathrm{P}-\mathrm{CD}$
4. La petite fille est lavée par le garçon.
-1 -
$\mathrm{AC}-\mathrm{P}-\mathrm{CD}$
5. Qui est cette fille?

$\mathrm{AC}-\mathrm{P}-\mathrm{CD}$
6. L'oiseau a fait son nid.
 cette table?
12. Le chat dont j 'ai tiré la queue m'a griffé.
$-2 \ldots \mathrm{AC}-\mathrm{P}-\mathrm{CD}$
13. Pierrette et sa maman ont fini leurs courses. $\qquad$ 3
$\mathrm{AC}-\mathrm{P}-\mathrm{CD}$
14. La petite fille lui brosse les cheveux.
_ 2
$\mathrm{AC}-\mathrm{P}-\mathrm{CD}$
15. Je mange les cerises que maman cueille. $\qquad$ $\mathrm{AC}-\mathrm{P}-\mathrm{CD}$
16. Le camion est suivi par la voiture.
17. J'aimerais bien aller dehors !
18. La petite fille est-elle tombée?

$\mathrm{AC}-\mathrm{P}-\mathrm{CD}$


3 $\mathrm{AC}-\mathrm{P}-\mathrm{CD}$
19. Philippe va lire un livre.
20. Maman a dit que je mette ma veste.


1 $\mathrm{AC}-\mathrm{P}-\mathrm{CD}$
21. Pourquoi as-tu cassé le jouet de ta sœur? $\qquad$ 3 $\mathrm{AC}-\mathrm{P}-\mathrm{CD}$

CI = Ig1: If1: $\qquad$ $; \mathbf{C G}=\operatorname{Ig} 2:$ $\qquad$ If2: $\qquad$ ; AC: $\qquad$ P: $\qquad$ CD: $\qquad$

Total: $\qquad$ /21

## Appendix E Reading Comprehension of Narrative Texts with Cultural Emphasis Task

## A. Texte narratif moins familier - Le déjeuner

## 1. VITESSE DE LECTURE:

Temps de lecture: $\qquad$ minutes $\qquad$ secondes.
$140 \times 60 /$ Nombre de secondes que l'enfant prend pour lire le texte. $8400 /$ $\qquad$ secondes que l'enfant prend pour lire le texte = $\qquad$ mots/minute.

Le déjeuner
Il est midi, on entend la sonnerie et Madame Joly, notre maîtresse, nous dit que c'est l'heure d'aller manger à la cantine. Tout le monde se lève pour se mettre en rang et sortir de la classe sans faire de bruit. Ensuite, nous allons à la cantine.

En entrant, nous prenons un plateau, une assiette, un couteau, une fourchette et une cuillère. La cantinière met des carottes râpées, de la purée, un bifteck haché sur mon assiette et je prends du fromage, un morceau de pain, un chou chantilly et un verre d'eau.

Je m'assois à une table avec cinq autres de mes copains. Nous rions beaucoup et nous parlons tous ensemble pendant que les maîtresses circulent entre les tables.

Quand on a fini de déjeuner, on se remet en rang pour sortir dans la cour de récréation.

## 2. COMPRÉHENSION:

## a. Free Recall

Examinateur: «Imagine que ton professeur entre dans la classe et te demande ce qui s'est passé dans l'histoire parce qu'il/elle n'a pas lu l'histoire. Que dirais-tu à ton professeur ? Dis à ton professeur tout ce dont tu te rappelles.» Un récit en anglais n'est pas pénalisé mais est noté E . Commencez à enregistrer en indiquant la date, le nom de famille et le prénom de l'élève et sa division en appuyant sur 'Rec' ET notez sa réponse par écrit le plus précisément possible ci-dessous (par mesure de précaution). Quand l'élève a fini, appuyez de nouveau sur 'Rec' qui est en fait pause.

Réponse de l'élève:

## b. Questions ouvertes littérales

Examinateur: «Je vais te poser cinq questions sur le texte. Je veux que tu me donnes le plus de détails possible. » Des réponses en anglais ne sont pas pénalisées mais sont notées E . Continuez à enregistrer ce que dit l'enfant en appuyant sur 'Rec' ET notez sa réponse par écrit le plus précisément possible ci-dessous (par mesure de précaution). Quand l'enfant a fini, appuyez de nouveau sur 'Rec' qui est en fait pause.

## NOTATION:

Attribuez 1 point par bonne réponse.

## QUESTIONS:

## Littérales

## 1. Où se passe l'histoire ? (1 point)

Réponse: a) À l'école.
Réponse de l'élève: $\qquad$

## 2. Qui parle ? (1 point)

Réponse: a) Un élève / Une fille / Un garçon.
Réponse de l'élève: $\qquad$

## 3. À quel moment de la journée se passe l'histoire? (1 point)

Réponse: a) Au moment du déjeuner / dîner (Québec) / lunch (Québec).
Réponse de l'élève: $\qquad$
4. Décris ce qui se passe ? Donne-moi trois activités. (3 points)

Réponses:
a) Les élèves vont manger le déjeuner (à la cantine).
b) Les élèves prennent un plateau (une assiette, un couteau, une fourchette et une cuillère).
c) Les élèves prennent de la nourriture (carottes râpées, purée, bifteck, fromage, pain, chou chantilly, verre d'eau).
d) Les élèves s'assoient ensemble avec leurs copains.
e) Les élèves rient et parlent.

Réponse de l'élève: $\qquad$

## 5. Que font les élèves à la fin ? (1 point)

Réponse: a) Ils vont dans la cour de récréation / Ils vont s'amuser dehors. Réponse de l'élève: $\qquad$
Total Questions Littérales: $\qquad$

## B. Texte narratif plus familier - Le lunch

## 1. VITESSE DE LECTURE:

Temps de lecture: $\qquad$ minutes $\qquad$ secondes.

135 X 60/Nombre de secondes que l'enfant prend pour lire le texte. 8100/ $\qquad$ secondes que l'enfant prend pour lire le texte = $\qquad$ mots/minute.

Le lunch
La cloche sonne. À 11 h 45 , la matinée est finie et nous écoutons sans faire de bruit les annonces de la journée. Ensuite, nous nous précipitons vers nos casiers au fond de la classe pour aller chercher notre boîte à lunch.

Chacun revient à son pupitre. Je prends mon sandwich, ma banane, mon biscuit et mes deux jus. Monsieur Nick, le professeur, aussi mange son sandwich à son bureau. Le téléphone de la classe sonne et je demande à Monsieur Nick si je peux répondre. C'est la secrétaire du bureau qui veut voir mon ami Jonathan.

Tout le monde mange vite pour aller dehors avec ses amis. Mais avant de sortir je dois nettoyer mon pupitre et ranger ma boîte à lunch.

Je me dépêche car il ne reste que vingt minutes de pause.

## 2. COMPRÉHENSION:

## a. Free Recall

Examinateur: «Imagine que ton professeur entre dans la classe et te demande ce qui s'est passé dans l'histoire parce qu'ilelle n'a pas lu l'histoire. Que dirais-tu à ton professeur ? Dis à ton professeur tout ce dont tu te rappelles. » Un récit en anglais n'est pas pénalisé mais est noté E. Commencez à enregistrer en indiquant la date, le nom de famille et le prénom de l'élève et sa division en appuyant sur 'Rec' ET notez sa réponse par écrit le plus précisément possible ci-dessous (par mesure de précaution). Quand l'élève a fini, appuyez de nouveau sur 'Rec' qui est en fait pause.

Réponse de l'élève:

Total Free Recall: $\qquad$ /87 M: $\qquad$ /27; S: $\qquad$ /22; D: $\qquad$ /24; C: $\qquad$ /14

## b. Questions ouvertes littérales

Examinateur: «Je vais te poser cinq questions sur le texte. Je veux que tu me donnes le plus de détails possible. » Des réponses en anglais ne sont pas pénalisées mais sont notées E . Continuez à enregistrer ce que dit l'enfant en appuyant sur 'Rec' ET notez sa réponse par écrit le plus précisément possible ci-dessous (par mesure de précaution). Quand l'enfant a fini, appuyez de nouveau sur 'Rec' qui est en fait pause.

## NOTATION:

Attribuez 1 point par bonne réponse.
QUESTIONS:

## Littérales

1. Où se passe l'histoire? (1 point)

Réponse: a) À l'école.
Réponse de l'élève:

## 2. Qui parle ? (1 point)

Réponse: a) Un élève / Une fille / Un garçon.
Réponse de l'élève: $\qquad$

## 3. À quel moment de la journée se passe l'histoire ? (1 point)

Réponse: a) Au moment du déjeuner / dîner (Québec) / lunch (Québec).
Réponse de l'élève: $\qquad$
4. Décris ce qui se passe ? Donne-moi trois activités. (3 points)

Réponses:
a) Les élèves prennent leur boîte à lunch.
b) Les élèves mangent à leur pupitre.
c) Les élèves prennent de la nourriture (sandwich, banane, biscuit, jus).
d) Le professeur mange dans la classe aussi.
e) Les élèves mangent vite.

Réponse de l'élève: $\qquad$

## 5. Que font les élèves à la fin ? (1 point)

Réponse: a) Ils vont dehors / Ils vont s'amuser.
Réponse de l'élève: $\qquad$
Total Questions Littérales: $\qquad$ 17

## 3. COMPARAISON DES DEUX TEXTES:

a. Questions ouvertes inférentielles

Examinateur: «Je vais te poser trois questions sur les deux textes. Je veux que tuy répondes le plus précisément possible. » Des réponses en anglais ne sont pas pénalisées mais sont notées E. Continuez à enregistrer ce que dit l'enfant en appuyant sur 'Rec' ET notez sa réponse par écrit le plus précisément possible ci-dessous (par mesure de précaution). Quand l'enfant a fini, appuyez de nouveau sur 'Rec' qui est en fait pause.

Question 1: Compare Madame Joly et Monsieur Nick. Qu'est-ce qu'ils font? Donne deux détails pour chacun. (4 points)

Réponses: Madame Joly
a) Elle nous amène à la cantine.

Monsieur Nick
b) Elle surveille à la cantine.
a) Il reste dans la classe.
b) Il mange dans la classe.
(Une femme et un homme n'est pas accepté - reposez la question sur ce qu'ils font)
Réponse de l'élève: $\qquad$

Question 2: Compare ce que les élèves mangent et boivent? Donne un détail de ce qu'ils mangent (la nourriture) et de ce qu'ils boivent (une boisson) pour chacun. (4 points)

Réponses: Le déjeuner
a) Carottes râpées, purée, bifteck haché, fromage, pain, chou chantilly.
b) De l'eau.
b) Du jus.
(Vous pouvez redonner le titre de chaque passage à l'élève)
Réponse de l'élève: $\qquad$
a) Sandwich, banane, biscuit.

## Question 3: Comment mangent les élèves? Donne un détail pour chacun. (2 points)

Réponses: Le déjeuner
a) Ensemble (6 par table).
b) Prennent leur temps (rient, parlent).
$\qquad$
Réponse de l'élève:

Total Questions Littérales:
Total Questions Inférentielles:
Total Questions:
a. Le déjeuner: $\qquad$ /7
b. Le lunch: $\qquad$ /7
a. Le déjeuner: ___/5
b. Le lunch: $\qquad$
a. Le déjeuner: ___ 12
b. Le lunch: $\qquad$ /12

# Appendix F Semantic Propositional Analysis 

Propositional Analysis of a Less Familiar Passage

## Le déjeuner

| P 1 | (3) : est (Il, midi) |
| :---: | :---: |
| P 2 | (2) : entend (on) [SONNERIE] |
| P 3 | (2) : Madame Joly |
| P 4 | (3) : dit (nous) [NOTRE MAÎTRESSE] |
| P 5 | (1) : CON (que) [P4] - relative clause |
| P 6 | (3) : c'est (l'heure) |
| P 7 | (3) : d'aller manger |
| P 8 | (3) : à la [CANTINE] |
| P 9 | (1) : se lève (tout le monde) |
| P 10 | (1): CON (pour) [P11] - purpose |
| P 11 | (1) : SE METTRE [EN RANG] |
| P 12 | (1) : CON (et) [P11] - coordination |
| P 13 | (2) : sortir (de la classe) |
| P 14 | (1) : CON (sans) [P15] |
| P 15 | (1) : faire de (bruit) |
| P 16 | (1) : CON (Ensuite) [P17] - succession |
| P 17 | (3) : allons (nous, à la cantine) |
| P 18 | (1) : entrant (en) |
| P 19 | (1) : prenons (nous) |
| P 20 | (1) : [UN PLATEAU] |
| P 21 | (1) : une assiette |
| P 22 | (1) : un couteau |
| P 23 | (1) : une fourchette |
| P 24 | (1) : CON (et) [P23] - coordination |
| P 25 | (1) : une cuillère |
| P 26 | (1) : met (la cantinière) |
| P 27 | (1) : des carottes (râpées) |
| P 28 | (1) : de la purée |
| P 29 | (1) : du bifteck (haché) |
| P 30 | (1) : sur mon assiette |
| P 31 | (1) : CON (et) [P30]- coordination |
| P 32 | (2) : prends (je) |
| P 33 | (1) : du fromage |
| P 34 | (1) : de pain (un morceau) |
| P 35 | (1) : un chou chantilly |
| P 36 | (1) : CON (et) [P35] - coordination |
| P 37 | (1) : un verre d'eau |
| P 38 | (3) : m'assois (je) |
| P 39 | (2) : à [UNE TABLE] |
| P 40 | (1) : CON (avec) [P41] |

```
P41 (2): cinq autres
P 42 (2): de [MES COPAINS]
P43 (2): rions (nous)
P44 (1): beaucoup
P 45 (1): CON (et) [P44] - coordination
P46 (2): parlons (nous)
P47 (1): tous ensemble
P }48\mathrm{ (1): CON (pendant que) [P49] - simultaneity
P }49\mathrm{ (2): circulent (les maîtresses)
P 50 (1): CON (entre) [P51]
P 51 (2): les tables
P 52 (1): CON (quand) [P53] - subordination
P 53 (1): a fini (on)
P 54 (1):[LE DÉJEUNER]
P 55 (1): se remet (on, en rang)
P 56 (1): CON (pour) [P57] - purpose
P 57 (3): aller
P }58\mathrm{ (3): dans la cour (de recréation)
```

Total: $\qquad$ /87

Note. $\mathrm{P}=$ Proposition. CON = sentence connective (e.g., causal, condition, purpose, concession, conjunction, and temporal). (1) = Proposition worth 1 point (detailed idea). (2) = Proposition worth 2 points (supporting idea). (3) = Propositions worth 3 points (main idea). Capitalized words represent the Targeted Words in the second language, French.

# Propositional Analysis of a More Familiar Passage 

## Le lunch

```
P 1 (1) : sonne [La CLOCHE]
P2 (3) : à 11h45
P}3\mathrm{ (3) : est finie (la matinée)
P4 (1): CON (et) [P3] - coordination
P 5 (3): écoutons (nous)
P6 (1) : CON (sans) - [P7]
P}7\mathrm{ (1): faire de (sans, bruit)
P}8\mathrm{ (3): les annonces
P9 (1): de la journée
P 10 (1): CON (ensuite) [P11] - succession
P}11\mathrm{ (2): précipitons (nous, nous)
P }12\mathrm{ (1): [NOS CASIERS] (vers)
P }13\mathrm{ (1): au fond de la classe
P 14 (1): CON (pour) [P13] - purpose
P 15 (3): aller chercher
P16 (3): [NOTRE BOÎTE À LUNCH]
P17 (2): revient [CHACUN]
P 18 (1): à [SON PUPITRE]
P}19\mathrm{ (1): prends (je)
P 20 (1): mon sandwich
P}21\mathrm{ (1): ma banane
P 22 (1): mon biscuit
P}23 (1): mes deux ju
P24 (1): CON (et) [P 23] - coordination
P}25\mathrm{ (1): Monsieur Nick
P26 (2): [LE PROFESSEUR]
P27 (2): mange
P 28 (1): CON (aussi) [P27] - conjunction
P29 (1): son sandwich
P 30 (2): à son bureau
P 31 (3): sonne (le téléphone)
P}32 (1): de la class
P 33 (1): CON (et) - [P32] - coordination
P 34 (2): demande (je)
P35 (1): à Monsieur (Nick)
P 36 (1): CON (si) [P37] - condition
P}37\mathrm{ (2): peux répondre (je)
P 38 (2): c'est (la secrétaire)
P 39 (1): du bureau
P 40 (1): CON (qui) [P38] - relative clause
P}41\mathrm{ (2): veut voir ([MON AMI])
P42 (1): Jonathan
```

P 43 (3): mange (tout le monde, vite)
P 44 (1): CON (pour) [P45] - purpose
P 45 (2): aller (dehors)
P 46 (1): CON (avec) [P47] - condition
P 47 (1): ses amis
P 48 (1): CON Avant de [P49] - addition
P 49 (1) : sortir
P 50 (1) : dois (je, nettoyer)
P 51 (1): mon pupitre
P 52 (1): CON (et) [P51]- coordination
P 53 (1): ranger
P 54 (1): (ma boîte à lunch)
P 55 (3): dépêche (je, me)
P 56 (1): CON (car) [P57] - cause
P 57 (2): reste (il ne que, vingt minutes)
P 58 (1): de pause
Total: $\qquad$ /87

Note. $\mathrm{P}=$ Proposition. CON = sentence connective (e.g., causal, condition, purpose, concession, conjunction, and temporal). (1) = Proposition worth 1 point (detailed idea). (2) = Proposition worth 2 points (supporting idea). (3) = Propositions worth 3 points (main idea). Capitalized words represent the Targeted Words in the second language, French.

## Appendix G Phonological Awareness Task

## Phoneme and Syllable Deletion (Adapted from Gaux, 1996)

## CONSIGNES POUR LA TÂCHE DE CONSCIENCE PHONOLOGIQUE:

Examinateur: « Je vais te dire des mots et j’aimerais que tu me les redises sans la partie que je t'indique."
Par exemple, si je te dis: « Comment dis-tu 'dictionnaire' sans le 'tio'? Tu dis 'dicnnaire'.»

ESSAIS:
Examinateur: «Maintenant, essayons ceux-ci ensemble.»
Dis-moi: clou sans le 1 cou
Dis-moi: cour sans le c our
Dis-moi: parapluie sans le ra papluie
Donnez la bonne réponse à l'élève après chaque essai ou dites « bonne réponse » si l'enfant a la bonne réponse.

## TEST:

Commencez à l'Item 1 de la liste ci-dessous pour tous les enfants.
Arrêtez après 5 erreurs consécutives.
NOTATION:
Écrivez 1 devant le mot si la réponse est bonne et 0 si la réponse est fausse.

1. $\qquad$ minou sans le mi (nou)
2. $\qquad$ renseignement sans le gne (renseiment)
3. $\qquad$ piano sans le a (pino)
4. $\qquad$ cueillette sans le ill (cue/ette)
5. $\qquad$ ballon sans le 1 (baon)
13.__ pyramide sans le r (py/amide)
6. $\qquad$ mouchoir sans le mou (choir)
7. $\qquad$ fromage sans le f (romage)
8. $\qquad$ portefeuille sans le te (porfeuille)
9. ___ crocodile sans le co (crodile)
10. ___ moustique sans le t (mousique)
11. $\qquad$ barbouillage sans le ill (barbowage)
$\qquad$
12. __ minéralurgie sans le lur (minéragie)
13. $\qquad$ galope sans le lo (gape)
14. $\qquad$ épouvantail sans le pou
(évantail)
15. $\qquad$ lecture sans le c (leture)
16. $\qquad$ représentativité sans le ti (représentavité)
18.__ juxtalinéaire sans le x (jutalinéaire)
19.__ bibliothéconomie sans le 1
(bibiothéconomie)
20.__constitutionnellement sans le tu
(constitionnellement)

Total: $\qquad$ 120

## Appendix H Spelling Task

Spelling Subtest Canada FIAT (Wormeli \& Ardanaz, 1987)
Commencez à l'Item 1 ('lave') p. 5 du manuel Canada F.I.A.T. pour tous les enfants.

## CONSIGNES POUR LA TÂCHE D'ORTHOGRAPHE:

Examinateur: «Maintenant, tu vas écrire des mots. Je vais dire un mot et lire le mot dans une phrase et je vais le redire. Tu vas écrire le mot à côté du nombre que je vais dire. N'écris pas avant que j'aie fini de lire la phrase. » Si l'élève n'a pas dès le début 6 bonnes réponses, arrêtez.

NOTATION:
Écrivez 1 devant le mot si le mot est écrit correctement et 0 si le mot est mal écrit.

## BASE:

La base est atteinte quand l'enfant a 6 bonnes réponses consécutives, sauf si le test commence à l'Item 1 . Si l'élève échoue un des premiers 6 items, l'examinateur devrait arrêter où l'élève est rendu au dernier Item (Item 55) ou si l'élève devient trop frustré pour continuer.

## PLAFOND:

Le plafond est atteint quand l'enfant a 6 erreurs consécutives où l'élève est rendu au dernier Item (Item 55) ou si l'élève devient trop frustré pour continuer.

| 1. lave | Pierre se lave les mains. | lave |
| :--- | :--- | :--- |
| 2. malade | Hier, elle était malade. | malade |
| 3. sa | Sa robe est très longue. | sa |

There were 55 test items.

Total: $\qquad$ /55

# Appendix I Verbal Working Memory Task <br> Digit Span Subtest - WISC-R (Wechsler, 1974) 

## A. Digits Forward

## CONSIGNES POUR LA TÂCHE DE MÉMOIRE (FORWARD):

Examinateur: «Je vais dire des chiffres (nombres). Écoute attentivement. Quand j'aurai fini de dire tous les chiffres, je veux que tu les répètes après moi. »

Les chiffres devraient être dits au rythme de un par seconde. Pour chaque item, faites passer les deux catégories, même si l'enfant a réussi ou n'a pas réussi la catégorie 1 de l'Item 1. Commencez avec l'Item 1 de la liste ci-dessous pour tous les enfants.

## NOTATION:

Attribuez 2, 1, ou 0 points comme suit:
2 points si l'enfant réussit les deux catégories pour chaque item.
1 point si l'enfant réussit une catégorie pour chaque item.
0 point si l'enfant échoue aux deux catégories.
Arrêtez si l'enfant échoue aux deux catégories d'un même Item.

## TEST:

Item

## Catégorie 1

3-8-6
3-4-1-7
8-4-2-3-9
3-8-9-1-7-4
5-1-7-4-2-3-8
1-6-4-5-9-7-6-3
2-9-7-6-3-1-5-4
7.

5-3-8-7-1-2-4-6-9
Catégorie 2
6-1-2

6-1-5-8
5-2-1-8-6
7-9-6-4-8-3
5.

5-1-7-2-3-8
9-8-5-2-1-6-3
6.
$2-9-7-6-3-1-5-4$
4-2-6-9-1-7-8-3-5

Total: $\qquad$ /14

## B. Digits Backward

CONSIGNES POUR LA TÂCHE DE MÉMOIRE (BACKWARD):
Examinateur: « Je vais dire d'autres chiffres. Mais cette fois-ci quand je m'arrête, je veux que tu me répètes les chiffres à l'envers. »

ESSAIS:
Examinateur: «Par exemple, si je dis 9-2-7.»
Que réponds-tu ? Si l'élève répond 7-2-9, l'examinateur dit: «C'est bien.» Passez à l'Item 1. Par contre si l'èlève ne répond pas correctement, l'examinateur dit: «Non, tu dis 7-2-9. J'ai dit 9-2-7, donc tu les dis à l'envers 7-2-9. "

Essayons un autre exemple:
Examinateur: «Par exemple, si je dis 5-6-3.»
Que réponds-tu ? Si l'élève répond 3-6-5, l'examinateur dit: «C'est bien. » Passez à l'Item 1.
Les chiffres devraient être dits au rythme de un par seconde. Pour chaque item, faites passer les deux catégories, même si l'enfant a réussi ou n'a pas réussi la catégorie 1 de l'Item 1.
Commencez avec l'Item 1 de la liste ci-dessous pour tous les enfants.

## NOTATION:

Attribuez 2, 1, ou 0 points comme suit:
2 points si l'enfant réussit les deux catégories pour chaque item.
1 point si l'enfant réussit une catégorie pour chaque item.
0 point si l'enfant échoue aux deux catégories.
Arrêtez si l'enfant échoue aux deux catégories d'un même Item.

## TEST:



Total: $\qquad$ /14

## Appendix J Vocabulary Task

Échelle de Vocabulaire en Image - ÉVIP (Dunn et al., 1993b)
On utilise les planches d'entraînement D et E de la série W (8 ans et plus).

## CONSIGNES POUR LA TÂCHE DE VOCABULAIRE:

Examinateur: «Tu aimes regarder des images ? Je vais t'en montrer. » Une fois la consigne donnée, on tourne à la planche d'entraînement $D$ et l'on continue: «Attention, il y a quatre images sur cette page. Chaque image a un numéro. » Montrez chaque image du doigt et en disant les numéros à tour de rôle $1,2,3$ et 4 .
«Écoute bien chaque mot que je te dis. Tu me diras alors le numéro de l'image qui représente ce mot, ou tu pointeras cette image du doigt. Voici le premier. »

ESSAIS:
Examinateur: «Dis-moi le numéro de l'image ou pointe du doigt l'image qui représente le mieux le mot 'roue'. > (Planche D série W). Si l'enfant dit 'quatre' ou montre l'image 4, l'examinateur dit: « Bravo!». On tourne à la planche d'entraînement E.
Si le sujet indique la mauvaise image, on lui donne la bonne réponse en expliquant pourquoi c'est la bonne, et l'on passe à la planche d'entraînement $E$.
Examinateur: « Quel est le numéro de l'image qui représente le mot 'géant' ? » (Planche E série W). Si l'enfant dit 'un' ou montre l'image 1 , l'examinateur dit: « Bravo ! ».
Si le sujet indique la mauvaise image, on lui donne la bonne réponse en expliquant pourquoi c'est la bonne. Dans ces situations, il faudra recommencer avec les planches d'entraînement du niveau plus bas ( 7 ans et moins) pour que le sujet parvienne, sans aide, à réussir deux mots de suite de son propre chef, sinon on terminera l'application: Planche A (mot 'poupée' - image '4'); Planche B (mot 'homme' - image ' 2 '); Planche C (mot 'se balancer' - image ' 3 ').

## TEST:

Une fois que le sujet a bien compris, on tourne à la planche 60 ( 5 items avant le niveau indiqué) pour le début de l'application ( 8 ans) et on dit: «Très bien ! Maintenant nous allons regarder d'autres images. Chaque fois que je dirai un mot, toi, tu diras le numéro de son image, ou tu pointeras du doigt vers l'image qui représente le mieux ce mot. Un peu plus loin dans le livre tu ne seras peut-être pas sûr/e de connaître certains des mots, mais regarde bien toutes les images quand même et choisis celle qui te paraît la meilleure. »

## NOTATION:

Indiquez le numéro ( $1,2,3,0 u 4$ ) donné par l'enfant à côté de l'Item dans la colonne 'Réponse'. Indiquez NR pour 'non répondu' dans la colonne 'Réponse'. Barrez le sigle si la réponse est erronée dans la colonne 'Echec'.

## BASE:

La base est atteinte quand l'enfant a 8 bonnes réponses consécutives.
PLAFOND: Le plafond est atteint quand l'enfant a dans la plus basse séquence de 8 réponses 6 échecs ou devient trop frustré.

## ITEMS DÉ L'ECHELLE, REPONSES, CODE DE NOTATION ET ECHECS



## Appendix K Morphological Awareness Task

(Desrochers, 2007)

## CONSIGNES POUR LA TÂCHE DE CONSCIENCE GRAMMATICALE:

Examinateur: «Tu vas lire des phrases dans lesquelles ils manquent des mots. À côté de la phrase, tu as quatre choix de réponses possibles: $a, b, c$, ou d.
Choisis la meilleure réponse qui complète le mieux la phrase. Encercle la bonne réponse. »

ESSAIS:
Examinateur: «Maintenant, essayons celles-ci ensemble. »

| 1 | $\ldots$ | ant déchiré leurs pantalons. | Il |
| :--- | :--- | :--- | :--- |
|  |  | b) | Vous |
| c) | Ils |  |  |
| d) | Tu |  |  |

## Attends le signal avant de continuer.

## TEST:

> «Choisis la meilleure réponse qui complète le mieux la phrase. Encercle la bonne réponse.»

| 1 | J'ai taché __ manteau. | a) m' <br> b) mon <br> c) ma <br> d) mes |
| :---: | :--- | :--- |

FIN

There were 7 practice items and 60 test items.

Total : $\qquad$ $/ 60$

## Appendix L Second Language Cultural Knowledge Task

## 1. CULTURAL WORDS FOR ‘LE DÉJEUNER’:

Examinateur: « Je veux que tu lises les mots suivants et que tu encercles ceux que tu as lus dans le texte. >

Encercle les mots que tu as vus dans le texte.

| la sonnerie | un bifteck haché | circulent | cinq |
| :--- | :--- | :--- | :--- |
| du fromage | notre maîtresse | la cafétéria | un plateau |
| la cantine | lentement | un verre d'eau | les couloirs |
| rions | une table | un chou chantilly | midi |
| la poubelle | mes copains | ramasser | le déjeuner |
| un sac à dos | partager | se mettre en rang | jeter |

$\qquad$ /8; Words Story-Theme: $\qquad$ /8; Words Theme: $\qquad$ 18

## 2. CULTURAL WORDS FOR 'LE LUNCH’:

Examinateur: «Je veux que tu lises les mots suivants et que tu encercles ceux que tu as lus dans le texte. "

Encercle les mots que tu as vus dans le texte.

| la cloche | son pupitre | mon sandwich | ranger |
| :--- | :--- | :--- | :--- |
| ma banane | le professeur | la cafétéria | nos casiers |
| notre boîte à lunch | lentement | mon biscuit | les couloirs |
| son bureau | mes deux jus | nettoyer | 11 h45 |
| la poubelle | mon ami | ramasser | le lunch |
| un sac à dos | partager | chacun revient | jeter |

$\qquad$ /8; Words Story-Theme: $\qquad$ /8; Words Theme: $\qquad$ 18

## Frequency of Words in Less and More Familiar Cultural Passages

(Baudot, 1992)
All words are considered high frequency words according to the Fréquences d'utilisation des mots en français écrit contemporain from the University of Montreal (Baudot, 1992).
"Based on a text with around 1 million words (...), although the relationship vocabulary/text is not linear, (...) more than $27.7 \%$ of the vocabulary words have only one occurrence, (...) around half (49.5\%) of the vocabulary words have no more than three occurrences, and (...) around three-quarter (75.4\%) of the vocabulary words have no more than 12 occurrences." (Baudot, 1992, p. 25, Translation by author)

Frequency of Words in Less and More Familiar Cultural Passages

| Types of Words | Le Déjeuner | Le Lunch |
| :---: | :---: | :---: |
| Target Words | le déjeuner (****) | le lunch ( - ) |
|  | la sonnerie (***) notre maîtresse (****) <br> la cantine ( ${ }^{* * *)}$ <br> se mettre en rang (****) <br> un plateau (****) <br> une table (****) <br> mes copains (****) | la cloche ${ }^{* * * *)}$ le professeur (****) nos casiers ( ${ }^{* * *}$ ) chacun revient (****) notre boîte à lunch (-) son pupitre (***) mon ami ( ${ }^{* * * *)}$ |
| Words StoryTheme | midi (****) | 11h45 (****) |
|  | du bifteck haché $(-) /\left({ }^{* *}\right)$ <br> du fromage (****) <br> un chou chantilly (****) /( - ) <br> un verre d'eau (****) <br> cinq ( ${ }^{* * * *)}$ <br> rions (****) <br> circulent (****) | mon sandwich ( ${ }^{* * *)}$ <br> ma banane (***) <br> mon biscuit ( ${ }^{* * *)}$ <br> mes deux jus (***) <br> son bureau (****) <br> nettoyer ( ${ }^{* * * *)}$ <br> ranger (****) |
| Words Theme | la cafétéria (**) | la cafétéria (**) |
|  | lentement (****) | lentement (****) |
|  | les couloirs (****) | les couloirs (****) |
|  | la poubelle (**) | la poubelle (**) |
|  | ramasser (****) | ramasser (****) |
|  | un sac à dos (****) | un sac à dos (****) |
|  | partager (****) | partager (****) |
|  | jeter (****) | jeter (****) |

Note. Target Words: Cultural words in the story specific to lunchtime atmosphere in school; Words Story-Theme: Cultural Words in the story relevant to the lunch theme; Words Theme:
Words relevant to the lunch theme but not in the story. The number besides each word corresponds to each of the category: (-) no occurrences, (*) only one occurrence, (**) no more than 3 occurrences, $\left({ }^{* * *}\right)$ no more than 12 occurrences, and (****) more than 12 occurrences.

Number of Occurrences in Less and More Familiar Cultural Passages

Percentage of Target Words, Words Story-Theme, Words Theme According to Number of Occurrences in Less and More Familiar Passages

|  | Le Déjeuner |  |  |  | Le Lunch |  |  |  |
| :--- | ---: | ---: | ---: | ---: | ---: | ---: | ---: | ---: |
| Number of <br> Occurrences | TW <br> $\%$ | WST <br> $\%$ | WT <br> $\%$ | Text <br> $\%$ | TW <br> $\%$ | WST <br> $\%$ | WT <br> $\%$ | Text <br> $\%$ |
| 0 | 0 | 12.5 | 0 | 29 | 25 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | .07 | 0 | 0 | 0 | 2.3 |
| $2-3$ | 0 | 0 | 25 | 1.4 | 0 | 0 | 25 | 0 |
| $4-11$ | 25 | 0 | 0 | 3.6 | 25 | 50 | 0 | 10.9 |
| $>12$ | 75 | 87.5 | 75 | 91.4 | 50 | 50 | 75 | 90.9 |

Note. Abbreviations signify the following in order: TW (Target Words), WST (Words Story Theme) and WT (Words Theme).

## Appendix M Interview Questions

## CONSIGNES POUR L'ENTREVUE:

Examinateur: «Je vais te poser deux question sur les deux textes. Je veux que tu y répondes le plus précisément possible. » Des réponses en anglais ne sont pas pénalisées mais sont notées E. Continuez à enregistrer ce que dit l'enfant en appuyant sur 'Rec' ET notez sa réponse par écrit le plus précisément possible ci-dessous (par mesure de précaution). Quand l'enfant a fini, appuyez sur 'Stop' qui est en fait l'arrêt définitif de l'enregistrement pour cet élève. Le numéro suivant du dossier devrait apparaître (i.e., 2 ou 3, etc.).

IMPORTANT: Ne pas inférer la réponse de l'élève. Posez des sous-questions telles que: (a) montre-moi dans le texte quel mot qui te fait dire cela, ou (b) qu'est-ce qui s'est passé
dans le texte qui te fait dire cela ou pourquoi tu dis cela. Montrez le texte si nécessaire.
Question 1: Quelle histoire as-tu trouvée la plus facile? Pourquoi?
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$

Question 2: Dans quelle histoire est-ce que tu aimerais être ? Pourquoi?
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$
$\qquad$


[^0]:    ${ }^{1}$ The term predictors is used as to encompass concurrent validity and not predictive validity as the research does not involve a time component.

[^1]:    ${ }^{2}$ The term unexplained variance is normally used to indicate measurement error when in fact Bernhardt (2005) defines unexplained variance as a variety of variables that could explain the variance in reading comprehension. Therefore, in the rest of this text, I will use hypothetical variables instead of unexplained variance.

[^2]:    ${ }^{3}$ CVC stands for consonant-vowel-consonant; CCVC for consonant-consonant-vowel-consonant; CV for consonant-vowel; and CCV for consonant-consonant-vowel.

[^3]:    ${ }^{4}$ A morphemic anomaly is measured by pronoun gender (Élodie met sa manteau - a masculine pronoun is obligatory in French before a masculine noun - son).
    ${ }^{5}$ An asemantic and agrammatical sentence is defined by the noun gender used (Blanche-Neige est une sorcier [Snow white is a witch] - the correct form should be the feminine form - sorciere), though without correcting the semantics 'sorcière' [witch] to 'fée' [wizard].

[^4]:    ${ }^{6}$ Inhibition may control in three ways the contents or working memory: access, deletion and restraint (Hasher, Zacks, \& May, 1999).

[^5]:    7 see notes 4 and 5 .

[^6]:    ${ }^{8}$ ÉVIP is the French analogue of the Peabody Picture Vocabulary Test-Revised (PPVT-R) (Dunn \& Dunn, 1997).

[^7]:    ${ }^{9}$ The morphological task was done in writing, as if it was done orally in this context, it would miss some grammatical morphemes.

[^8]:    ${ }^{10}$ Episodic memory is generally described as the storage and recollection of personally-relevant events and experiences (Tulving, 1972).

[^9]:    ${ }^{11}$ Acceptable range of values for skewness is between -2.5 and +2.5 (Tabachnick \& Fidell, 2001).

[^10]:    Note. Variables 1 to 6 are the outcome variables, and variables 7 to 15 are the predictor variables. Abbreviations of variables signify the following in order: WI (Word Identification FIAT), RC (Reading Comprehension of Isolated Sentences LMC-R), CQ LF (Comprehension Questions Less Familiar), CQ MF (Comprehension Questions More Familiar), RIC LF (Recall Ideas and Connections Less Familiar), RIC MF (Recall Ideas and Connections More Familiar), PA (Phonological Awareness), S (Spelling FIAT), VWM (Verbal Working Memory WISCR), V (Vocabulary ÉVIP), MA (Morphological Awareness), CWRLF (Cultural Word Recognition Less Familiar), CWPLF (Cultural Word Production Less Familiar), CWRMF (Cultural Word Recognition More Familiar), CWPMF (Cultural Word Production More Familiar).
    ${ }^{* * *} p<.001$ (2-tailed). ${ }^{* *} p<.01$ (2-tailed). ${ }^{*} p<.05$ (2-tailed).

[^11]:    12 The formula of the relative Pratt Index is $d_{j}=\beta^{*} r_{j} / R^{2}$ (Beta x [Correlation with dependent variable $/ \mathrm{R}^{2}$ ]).

[^12]:    ${ }^{13}$ The formula for the effect size is $f^{2}=R^{2} /\left(1-R^{2}\right)$. According to Cohen (1992), an effect size is defined as "small = .02 "; "medium = .15 ", and "large = 35 " (p. 157).

[^13]:    ${ }^{14}$ As explained in Chapter 3, it is important to remind the reader that oral receptive vocabulary was measured using general oral receptive vocabulary (ÉVIP - French PPVT).

[^14]:    ${ }^{15}$ As explained also in Chapter 3, second language cultural knowledge was measured using cultural oral receptive vocabulary (Cultural Words Sheet) of narrative texts with cultural emphasis.

[^15]:    ${ }^{16}$ The term 'at risk' means "at risk of reading difficulties" and was defined as follows: 'low risk' when only one variable other than word reading is below average significantly (i.e., misses the average cut off by only one point); 'high risk' when word reading is below average or when any combinations of variables is below average significantly (i.e., by more than just one point).

