The development of second language productive vocabulary
in an intensive ESL classroom


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**ABSTRACT**

The development of second language productive vocabulary in an intensive ESL classroom

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The aim of this study was to investigate how second language (L2) productive vocabulary develops over time by targeting multiple dimensions of word knowledge. The research questions addressed were: a) How does the productive vocabulary of 11-12 year-old L2 learners in an intensive ESL program in Quebec develop over time with regard to vocabulary size, lexical richness, and lexical depth? and b) What similarities or differences can be observed between written vocabulary development and spoken vocabulary development? The study drew on a 58,000-word written corpus and a 28,000-word spoken corpus produced by 108 beginner-level francophone learners of English (11-12-year-olds). Data analyses were based on several measures which included counts of word families, percentages of 1K, 2K, and 3K+ words, types-per-family ratios, and counts of 2-word lexical bundles, all analyzed using the tools available at www.lextutor.ca. Two-way analyses of variance (ANOVAs) with modality (written, oral) and time (T1, T2) as between-participants factor were used to compare the four learner corpora (written and oral at T1 and T2). Findings indicate that learners' written vocabulary developed in all three dimensions (vocabulary size, lexical richness, and lexical depth), and that their spoken vocabulary improved only in lexical richness but showed no significant growth in size and lexical depth. The results suggest that overall learners performed better in written than in spoken modality, which could be attributed to a) task-specific effects, b) differences between spoken and written language access, and c) differences in the nature of spoken and written vocabulary used.

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CHAPTER 1: INTRODUCTION

Without a doubt, the learning of vocabulary is one of the most important aspects of second language (L2) development. As noted by Milton (2009, p.3), "words are the building blocks of language and without them there is no language". In the past decades, the importance of vocabulary for developing L2 proficiency has been gradually acknowledged by both language researchers and teachers, and a number of influential books have been published concerning L2 vocabulary theory, research and pedagogy (Nation, 2001; Milton, 2009; Schmitt & McCarthy, 1997; Schmitt, 2000). In fact, there are currently general agreements among researchers and teachers regarding how L2 vocabulary is acquired and the nature of L2 vocabulary knowledge.

Two Views of L2 Vocabulary Learning

Two main views of vocabulary acquisition have been widely discussed in L2 vocabulary literature: intentional vocabulary learning and incidental vocabulary learning. Intentional learning directly focuses attention on the information to be learnt and memorized. In contrast, incidental learning can occur through learners' exposure to spoken and written input (Schmitt, 2000). L2 vocabulary research has demonstrated that both explicit intentional learning (e.g., Horst, Cobb, & Nicolae, 2005; Laufer, 2005) and incidental exposure can lead to valuable learning (e.g., Horst, Cobb, & Meara, 1998; Webb & Rodgers, 2009).

Researchers now generally agree that for L2 learners both intentional learning and learning from incidental exposure are very important sources of knowledge about L2 vocabulary, and that the two kinds of learning are complementary (Schmitt, 2000; Milton, 2009). Intentional learning maximizes the likelihood that words will be acquired, but given the time constraints in a language classroom, it is impossible to teach explicitly all words and all types of word knowledge to students. It is expected, therefore, that learners will "pick up

other words and learn how to use already known words as learners engage in communicative activities. However, learning through exposure is a slow and gradual process, and word uptake from truly incidental exposure tends to be "fragile" and subject to forgetting. Therefore, as Milton (2009) suggests, incidental exposure to L2 vocabulary needs to be supplemented with intentional learning to help learners retain the vocabulary acquired.

The Nature of L2 Vocabulary Knowledge

Vocabulary knowledge is not an all-or-nothing phenomenon. Rather, it represents a continuum with increments of knowledge attained through multiple exposures to words in different contexts (Nation, 2001; Schmitt, 2000). This incremental view of vocabulary knowledge assumes that vocabulary learning involves the acquisition of multiple dimensions of word knowledge (e.g., form, meaning associations, grammatical functions, collocations, etc.), not all of which can be learnt simultaneously (Nation, 2001; Schmitt, 2000). Furthermore, it is a common assumption that vocabulary knowledge is generally divided into receptive and productive, and that the number of words that learners can recognize through listening and reading (receptively) is greater than the number of words that they can call to mind and produce in speaking or writing (productively) (Milton, 2009; Nation, 2001).

These assumptions about the nature of L2 vocabulary knowledge suggest a number of principles that L2 vocabulary development research may follow. The incremental nature of vocabulary learning indicates that L2 vocabulary research should give prominence to longitudinal designs in order to better capture how learners' vocabulary knowledge develops incrementally over time. In addition, given that the complete mastery of a word entails several components of word knowledge, L2 vocabulary research needs to target multiple dimensions of word knowledge in a single study to gain insight of how these different dimensions of word knowledge develop within the same group of learners. Further, because it

is generally assumed that learners' productive vocabulary knowledge is weaker than their receptive vocabulary knowledge, it is important to investigate how different aspects of productive vocabulary knowledge develop and where the possible difficulties lie in the learners' acquisition process.

However, the L2 vocabulary development studies conducted so far have not addressed the issues discussed above very well. Not many L2 vocabulary studies have targeted the development of productive vocabulary knowledge using a longitudinal research design, and even fewer studies have examined the acquisition of multiple dimensions of word knowledge. As a matter of fact, there is a lot of inconsistency among the studies on L2 productive vocabulary regarding which aspects of word knowledge to focus on and in which way to measure these aspects of knowledge. Therefore, a longitudinal study focusing on productive vocabulary development and simultaneously targeting multiple aspects of word knowledge would help gain a clearer understanding of how different aspects of productive vocabulary develop over time.

The Current Study

The goal of the current study is to gain a better understanding of how different aspects of L2 productive vocabulary knowledge develop concurrently over time. For the purpose of the study, different aspects of productive word knowledge are categorized into three main dimensions: a) vocabulary size in terms of how many words learners can produce, b) lexical richness in terms of how many different types of words learners can produce, and c) lexical depth in terms of the qualities of words learners can produce. Each dimension of word knowledge will be explored and findings regarding these dimensions of word knowledge will be discussed in the review of the literature in Chapter Two.

The participants in the current study were 108 French speaking Grade 6 children (aged

11-12 years) enrolled in French elementary schools in the province of Quebec. The learners could be classified as beginning learners of English, and at the time of the study they were all enrolled in intensive ESL programs. These ESL programs were communicative and meaning-focused in nature, with an emphasis on speaking and listening skills. In such a context, although students did receive explicit instruction on meanings of words, no classroom tests specifically targeted the words covered in class and the main focus of instruction was on the development of students' communicative skills. Therefore, the word knowledge that students acquired in this context can be assumed to have been acquired incidentally (Hulstijn, 2003). Vocabulary learning occurs, by and large, through incidental exposure in situations where learners encounter and "pick up" words from natural language input and communicative activities in class, rather than from teachers' intentional, explicit instruction targeting specific lexical items.

Corpus data were collected and analyzed from communicative tasks in both written and spoken modalities in order to answer the two research questions guiding this study:

1. How does beginning L2 learners' productive vocabulary develop over time with regard to vocabulary size, lexical richness, and lexical depth?

2. What similarities or differences can be observed between written vocabulary development and spoken vocabulary development?

This remainder of this thesis is organized into five chapters. In Chapter Two, literature related to the current study is reviewed. In Chapter Three, all details of the current study's methodology are presented, including the description of the participants tested, the instruments used, and the procedure followed. Chapter Four presents the results of statistical data analyses. Chapter Five includes the discussion of the study's results, presented separately for each of the two research questions and followed by the summary of the discussion. Chapter Six contains an explanation of how the study contributes to the field of productive

vocabulary development, outlines a series of limitations of the current study, and offers

possible directions for future research.

CHAPTER 2: LITERATURE REVIEW

In this chapter, the present study will be discussed within a narrower area of longitudinal research on L2 productive vocabulary development. In terms of productive vocabulary development over time, previous research has predominantly focused on broad measures of lexical growth. The focus of the majority of studies falls into three main dimensions of productive vocabulary knowledge: vocabulary size *(how many words are produced)*, lexical richness (*what types of words are produced)* and lexical depth (*how well these words are produced*). This chapter starts with a brief overview of the studies targeting productive L2 vocabulary development over time. It will then be followed by a more detailed review of the literature regarding the characteristics of measures used to study productive L2 vocabulary development over time.

Longitudinal Studies on Productive Vocabulary Development

Eight studies have thus far examined productive L2 vocabulary development over time. Of the eight, seven investigated L2 vocabulary growth without taking treatment manipulation into consideration (Bulte, Housen, Pierrard, & Van Daele, 2008; Crossley, Salsbury, & McNamara, 2009; Horst & Collins, 2006; Laufer, 1992; Palmberg, 1987; Schmitt & Meara, 1997; Schmitt, 1998). The remaining study (Nadarajan, 2009) is a longitudinal treatment study aiming to investigate the effect of instructional options, or different types of learning contexts, on L2 learners' vocabulary development. The eight longitudinal studies are summarized in Table 1, in chronological order.

The length of research period for the eight longitudinal productive vocabulary studies ranges from three months to three years. Two of the eight studies are relatively small-scale studies (Crossley et al. 2009; Schmitt; 1998). English vocabulary development was the target in seven studies (Crossley et al., 2009; Horst & Collins, 2006; Laufer, 1992; Palmberg, 1987;

Schmitt & Meara, 1997; Schmitt, 1998; Nadarajan, 2009), while one study looked into vocabulary development in French (Bulte et al., 1998). Six studies (Bulte et al., 1998; Horst & Collins, 2006; Laufer, 1991; Palmberg, 1987; Schmitt & Meara, 1997; Schmitt, 1998) were conducted in foreign language learning contexts, and two were conducted in second language learning contexts (Crossley et al., 2009; Nadarajan, 2009). Three studies targeted adolescent learners (Bulte et al., 2008; Horst & Collins, 2006; Palmberg, 1987), while the remaining five focused on adult learners (Crossley et al., 2009; Laufer, 1992; Nadarajan, 2009; Schmitt & Meara, 1997; Schmitt, 1998).

In addition to differences in length of learning time, research contexts, scales and participants' situation, as can be seen from the last column of Table 1, the eight longitudinal studies also investigated different types of vocabulary knowledge. Because one of the questions addressed in the current study is how different aspects of vocabulary knowledge develop over time, the findings related to this issue will be reviewed first.

Table 1

*Longitudinal Studies of L2 Productive Vocabulary Development*

| Study | Length of study | *n* | Research context | Participants background | Participants proficiency level | Vocabulary knowledge targeted |
|---|---|---|---|---|---|---|
| Palmberg (1987) | 5 months | 22 | EFL | Finland learners; age 11 | Beginning | Written vocabulary size |
| Laufer (1991) | 2 semesters | 47 | EFL | Israeli learners; age 18-23 | Advanced | Written lexical richness |
| Schmitt & Meara (1997) | 1 year | 95 | EFL | Japanese learners; age 17-20 | Intermediate | Written vocabulary size, grammatical suffix knowledge, and word association knowledge |
| Schmitt (1998) | 1 year | 3 | ESL | Varied L1 background; post graduate students | Advanced | Spoken spelling, grammar, and association meaning knowledge |
| Horst & Collins (2006) | 400 instruction hours | 230 | ESL | French learners; age 11-12 | Beginning | Written lexical richness |
| Bulte, Housen, Pierrard, & Van Daele (2008) | 3 years | 19 | FFL | Dutch learners; adolescent | Advanced | Spoken lexical diversity, lexical sophistication and lexical productivity |
| Crossley, Salsbury, & McNamara (2009) | 1 year | 3 | ESL | Varied L1 background; undergraduate age 18-29 | Intermediate | Spoken lexical diversity and word association knowledge |
| Nadarajan (2009) | 1 semester | 64 | Immersion & ESL | Varied L1 background; undergraduate | Advanced | Written vocabulary size |

Measures Used in Longitudinal Studies of L2 Vocabulary Development

As was mentioned previously, longitudinal studies of L2 productive vocabulary development have mainly targeted three dimensions of vocabulary knowledge: vocabulary size, lexical richness, and lexical depth. Depending on the specific dimensions of vocabulary knowledge studied, diverse methods were applied to measure vocabulary knowledge in these studies. The eight studies listed in Table 1 are discussed in detail in the following sections in terms of the characteristics of the measures used in these studies.

*Studies Using Measures of Vocabulary Size*

Vocabulary size in research on productive vocabulary development is commonly measured in terms of how many words learners can produce. It is typically investigated by using free word production tasks (Palmberg, 1987) or de-contextualized productive vocabulary level tests (Nadarajan 2009; Schmitt & Meara, 1998). A pilot study conducted by Palmberg (1987) is perhaps one of the earliest longitudinal studies specifically addressing written vocabulary growth over time. The goal of the study was to examine productive vocabulary development as it took place in an ordinary foreign-language classroom setting. Twenty-two Finnish-Swedish bilingual pupils (11 girls and 11 boys, all age 11) learning English as a foreign language participated in the experiment. The pupils were asked to write down as many words as they could possibly think of that began with a given letter within a one-minute period. The data were collected weekly during a 10-week experimental period. This type of a free word production task, in fact, could not provide information about the actual size of an individual's productive vocabulary. However, the total number of words produced by the pupils during 10 consecutive test sessions, nonetheless, showed that there was a steady increase in word production from session to session.

Schmitt and Meara (1998) showed an increase in participants' vocabulary size by using Nation's Levels test (Nation, 1990), a vocabulary-size test that probes vocabulary knowledge

at five frequency levels (words drawn from 2K, 3K, 5K, and 10K frequency lists as well as from the English Academic Word List). The proportion of correctly answered items at each level is taken to be the proportion of total words known at that level, and the totals for each level are added together to reach an estimate of the overall vocabulary size. These authors found that among 95 adult Japanese English L2 learners in foreign language contexts, there was an average 330 word vocabulary gain over the course of one academic year.

Nadarajan (2009) also found an increase in written vocabulary size over time among the participants in his study, regardless of the two different instruction conditions investigated. This author investigated whether explicit vocabulary instruction involving focus-on-form activities would be more beneficial than implicit meaning-based vocabulary instruction in helping learners acquire 20 high-frequency academic words. Laufer and Nation's (1999) Productive Vocabulary Levels Test (PLVT) was used to measure vocabulary gains, and the data were collected at the beginning and the end of the semester from 129 undergraduate English L2 learners in six intact academic writing classes. Findings revealed an increase in the post-test scores for both the implicit group and the explicit instructional group for the 3K word level and words from the Academic Word List (AWL) (Coxhead, 2000). However, contrary to the authors' prediction, the post-test scores for the implicit group showed a greater gain compared to the explicit group, which implies that implicit meaning-based vocabulary instruction might be more effective than explicit vocabulary teaching in helping adult L2 learners enlarge their vocabulary. Nadarajan (2009) pointed out that given the heterogeneous nature of L2 learners, several factors may play important roles in affecting vocabulary development process, such as the level of motivation, the amount of exposure to the target language, in-depth elaboration and familiarity of the words used by instructors, the quality of instruction, and the learners' initial vocabulary level.

To sum up, in terms of vocabulary size, the literature seems to suggest that a steady

increase in numbers of words used in writing could be expected from both young learners and adult learners in classroom contexts over a period of 10 weeks or longer. Previous cross-sectional vocabulary studies in fact confirm this finding by proposing that learners' vocabulary uptake from regular classroom contact appears to be remarkably consistent, about four words per hour as a general average (Milton, 2009, p.89). However, as indicated by Nadarajan (2009), many factors may play an important role in affecting the growth of vocabulary, including individual differences (i.e. individual interest and motivation, proficiency level, type of input and time of exposure) and instructional factors (i.e. quality of instruction). Moreover, because previous studies have used different measures of vocabulary size, it is difficult to compare vocabulary gains across studies. Therefore, there is a need for more research focusing on L2 vocabulary development with better control of instructional and individual difference factors.

*Studies Using Measures of Lexical Richness*

Lexical richness in research on productive vocabulary development is generally measured (typically through corpus-based counts) in terms of the number of different types of words learners can produce. However, the specific aspects of vocabulary knowledge that have been targeted are in fact relatively inconsistent across studies. One reasons for this is that lexical richness has been operationalized in a variety of ways in the literature. Most commonly used measures of lexical richness include lexical density (i.e. percentage of content words), lexical sophistication (i.e. percentage of less frequent words), and lexical diversity (i.e. type-token ratio).

Laufer (1991), for example, investigated advanced adult L2 English learners' vocabulary development in terms of lexical richness over a two-semester period. The study was carried out in the context where participants received no explicit vocabulary instruction, but were nevertheless exposed to language. Lexical richness was operationalized in terms of

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four variables, namely lexical variation (LV, defined as the ratio between the different lexemes [individual word families] in the text and the total number of lexemes), lexical density (LD, defined as the percentage of nouns, verbs, adjectives and adverbs in the text), lexical originality (LO, defined as the percentage of lexemes that are used by only one particular writer of the group) and lexical sophistication (LS, defined as the percentage of "advanced words", or words taken from Xue and Nation's (1984) University Word List, a list of 737 base words and over 1,400 derivatives). Free compositions written by the participants were collected at the beginning and the end of a semester and were later analyzed. The comparison of each of the four variables showed that, with the exception of lexical sophistication, no significant development in productive vocabulary occurred after one academic year for these advanced learners. Examination of individual learners further suggested that learners whose initial vocabulary proficiency levels were below average made progress on each variable in order to function at the average level of their group. However, advanced students who had no problem functioning in their environment and performing their school tasks did not exhibit significant progress. Based on the results, Laufer (1991) proposed the "active vocabulary threshold hypothesis", suggesting that productive vocabulary development is determined not so much by comprehensible input as by the needs of individual learners for reaching the average level of the group in which they are required to function.

A written corpus of L2 learners was also used in the study conducted by Horst and Collins (2006) to investigate the development of lexical richness in young learners. The participants in this study were beginner-level francophone learners of English (11-12-year-olds) enrolled in an ESL intensive program in the French-speaking province of Quebec. Narrative writing texts produced in response to picture prompts were collected four times at regular intervals of 100 hours of intensive ESL program (approximately 400 hours in

total). A computational tool, Vocabprofile (Laufer & Nation, 1995), was used to measure lexical richness by determining the proportions of running words in the corpus which can be found at 1K (1000 most frequent families) and 2K (2000 most frequent families) frequency levels. Surprisingly, these analyses did not reveal the expected increase in use of less frequent words in learners' written productions after 400 hours of instruction. In other words, after a substantial period of intensive instruction, any changes in the young English L2 beginners' vocabulary did not seem to entail the acquisition of more advanced words (i.e. less common words).

A spoken corpus was used in a more recent study conducted by Bulte et al. (2008) to investigate oral productive vocabulary development in terms of lexical diversity (i.e. type-token ratio), lexical sophistication (i.e. percentage of less frequent words in the corpus), and lexical productivity (i.e. percentage of content words in the corpus). The target language in this study was French. What was emphasized by the authors was the special "French as a foreign language context" in Brussels, namely, the officially Dutch-French bilingual but predominantly francophone context. The participants, who were Dutch speaking pupils from Dutch secondary schools in Brussels, had had relatively large amounts of naturalistic exposure to French in addition to their four-year regular formal classroom instruction in French. Data from the unplanned oral retelling tasks were collected three times throughout the two-year research period. Notably, 22 different measures were used to analyze the data in order to adequately capture the dynamics of lexical L2 proficiency development over time. Statistical results indicated that learners progressed significantly in terms of lexical diversity, sophistication and productivity after two years of study. However, for the Dutch-speaking pupils, the development of lexical proficiency, particularly in terms of lexical productivity and diversity somehow trailed off after the first year.

Also using a spoken corpus, Crossley et al. (2009) investigated L2 lexical development

in the spontaneous speech of six adult L2 English learners at an intermediate level in a one-year longitudinal study in an ESL context. In terms of lexical growth, the authors adopted the Measure of Textual and Lexical Diversity (MLTD, McCarthy, 2006) to measure the type-token ratio of the corpus. According to the authors, MLTD is able to assess differences in lexical diversity even when the texts are considerably different in terms of length. Crossley et al.'s findings showed that as learners spent time studying the target language, their lexical diversity increased.

To summarize, learner corpora have been commonly used in literature to investigate L2 productive vocabulary development in terms of lexical richness. However, the inconsistencies of research focus in these studies, namely, the specific dimensions of lexical richness investigated, the specific groups of participants studied, and the specific research contexts targeted, in fact, make it difficult to compare the results across studies. Regarding oral productive lexical growth, the findings of Bulte et al. (2008) and Crossley et al. (2009) seem to suggest that in contexts where learners can have adequate exposure to the target language, traceable development with regard to lexical diversity (i.e. type-token ratio) in speaking tasks could be expected from learners over one year of study. In terms of written productive vocabulary development, in contrast, learners showed little progress over time in lexical sophistication (i.e. the acquisition of less frequent words) in the studies by Laufer (1991) and Horst and Collins (2006). It seems that factors including participants' age and proficiency level play an important role in affecting the development of lexical richness. In sum, more research is needed if we are to gain a better understanding of how L2 productive vocabulary develops over time in classroom contexts.

*Studies Using Measures of Lexical Depth*

Vocabulary depth is often defined in terms of how well individual words are known (Schmitt & Meara, 1997). This definition of vocabulary depth is also found in Daller et al.

(2007), who refer to vocabulary depth as the quality of a learner's knowledge of words. A number of measures have been used so far to assess lexical depth. For example, Wesche and Paribakht's (1993) Vocabulary Knowledge Scale (VKS) which was designed to measure discourse connectives was an important attempt to assess the quality of words in vocabulary literature. With regard to productive vocabulary development, depth has typically been investigated in the literature using measures of association knowledge (Crossley et al., 2009; Haastrup & Henriksen, 2000; Schmitt & Meara, 1997; Webb, 2005), syntactic knowledge (Webb, 2005); morphological knowledge (Schmitt & Meara, 1997), collocational knowledge (Boers et al., 2006), as well as spelling and meaning knowledge (Schmitt, 1998; Webb, 2005). And tasks used to elicit vocabulary depth have differed considerably from study to study. For example, Schmitt and Meara (1997) investigated the development of two types of word knowledge in terms of lexical depth: word association, namely, the links connecting words in some manner in a person's mind (e.g. *reflect-effect*, *reflect-mirror*) and grammatical knowledge (i.e. the use of morphemes, such as *-ed, -ing, -ment, -s, -ion, -ly, -ence, -ee, -age, -er, -ive, -able, -al,* and *-ure*). Twenty English verbs were chosen as target vocabulary, and word association tests and suffix knowledge tests in written modality were designed and used to assess both receptive and productive knowledge. Ninety-five secondary and postsecondary Japanese L2 learners of English at an intermediate level took part in the research. It was found that the participants performed 19% to 25% points better on the tests of receptive than productive knowledge. However, poor knowledge of allowable verb suffixes, especially derivative suffixes, was observed in the results. Likewise, participants showed poor mastery of verb associations, which implies that even after an entire academic year very limited gains concerning word association and grammatical suffix knowledge were observed among intermediate adult L2 learners.

Horst and Collins's (2006) results on young L2 learners' knowledge of grammatical

morphology differed from the findings reported by Schmitt and Meara (1997). Horst and Collins suggested that their learners' vocabulary developed in diverse directions. As mentioned earlier, these authors found that young beginning learners did not acquire many new low-frequency words. Nonetheless, they observed that learners used more morphologically derived forms in their writing productions as the amount of L2 classroom exposure increased.

In a more recent study by Crossley et al. (2009), word association knowledge was also investigated. Particularly, these authors looked into the knowledge of hypernymic relations, or the hierarchical relationships among related words that vary in relation to their semantic specificity (e.g. *Golden Retriever* vs. *dog* vs. *animal*). Six adult intermediate L2 English learners who were enrolled in an intensive English program at an American university participated in this longitudinal study. The participants engaged in free conversations every two weeks over a one-year period. Prompts such as picture description tasks, questions and topics for discussion were provided to participants as elicitation materials to promote spontaneous speech. The researchers employed a computational approach (Coh-Metrix) based on the research by Graesser, McNamara, Louwerse, and Cai (2004) to measure hypernymy knowledge development. Calculations of hypernymy values demonstrated that over a year of study, the participants' knowledge of hypernymic relations increased, and the growth of hypernymy relationships was particularly notable in the first four months of study. Additionally, lexical diversity and hypernymic values correlated significantly. Specifically, the results suggested that the participants developed the ability to use more abstract language as amount of L2 experience increased.

Schmitt (1998) conducted another study to investigate how individual words are acquired. Four aspects of vocabulary knowledge in terms of lexical depth were measured: a) spelling, b) associations, c) grammatical information, and d) meanings. Eleven target words,

which were all polysemous with three or more meaning senses (e.g. *brood, spur, abandon*), were chosen from the University Word List (UWL, Xue & Nation, 1984) and the Brown corpus (Francis & Kucera, 1982) at the 4K to 5K word level. The participants were three adult learners with advanced proficiency in English. At half-year intervals, the researcher interviewed the participants individually on three separate occasions on their knowledge of spelling, association, grammar and meaning of the 11 target words in lockstep order. Questions such as "How do you spell _____?" "Please give the first three words you think of when you hear the word _____", "What word class is _____", "What is the meaning of _____" were asked in the interview to elicit from the participants the four aspects of word knowledge.

The results of this study showed that the participants had little problem with spelling. In terms of meaning, two of the three participants progressed steadily over the academic year, while one remained relatively stable. However, they rarely knew all of a target word's meanings, which indicates that knowledge of multiple meanings does not change easily. Regarding knowledge of associations, for the advanced learners in this study, the results suggest that they were likely to provide NS-like associations, but only when the word they knew was part of a known phrase (i.e. giving *moment* as the association of *spur* only based on the knowledge of the idiom *spur of the moment*). With respect to derivative forms (e.g. *employ, employee, employment, employable*), findings by Schmitt and Meara (1997) earlier suggested that intermediate Japanese EFL learners did not have very good mastery of different derivative forms of words, and Schmitt (1998) obtained similar results with advanced learners in his study. Notably, Schmitt (1998) suggested that the four aspects of word knowledge may develop concurrently, but found no evidence for a developmental hierarchy for word knowledge types.

Among the longitudinal productive vocabulary studies targeting lexical depth, what is

worth noting is that few have looked into lexical depth as a function of the knowledge of collocations, which is in fact a very important aspect of vocabulary knowledge (Nation, 2001). Psycholinguistic evidence indicates that collocations are essential for fluency in both writing and speaking. More specifically, psycholinguistic research suggests that the availability of large numbers of collocations in memory reduces the processing effort and therefore makes fluent language possible (Ellis, 2001; Miller, 1956; Pawley & Syder, 1983). Secondly, mastery of collocations is believed to be beneficial for L2 learners in that collocations can constitute "zones of safety", which may reduce learners' risk of making errors in their language production (Boers et al., 2006). Among a number of constructs within the dimension of lexical depth (e.g. word association knowledge, morphological knowledge, etc.), collocational knowledge appears to be essential for L2 learners to achieve fluency and accuracy in both writing and speaking.

To summarize, a limited number of studies have looked into the longitudinal development of productive L2 vocabulary depth. The results obtained in these studies have been relatively inconsistent due to differences in participants' proficiency levels, language contexts and tasks used to elicit vocabulary knowledge. Also, the lack of longitudinal investigation of collocational knowledge development needs to be addressed with future research. Therefore, based on the findings reviewed so far, it is clear that more research is needed for a better understanding of the manner in which vocabulary depth is acquired.

## Summary of Previous Research

The goal of Chapter Two has been to review existing research on longitudinal L2 productive vocabulary development taking into consideration three types of vocabulary knowledge: vocabulary size, lexical richness, and lexical depth. It appears that research looking into the development of productive vocabulary size consistently suggests a steady

increase in learners' written vocabulary in classroom based contexts (Nadarajan, 2009; Palmberg, 1987; Schmitt & Meara, 1997). Secondly, in terms of lexical richness, studies suggest a traceable development in oral performance with regard to lexical diversity (i.e. type-token ratio) in contexts where learners have adequate exposure to the target language (Bulte et al., 2008; Crossley et al., 2009). However, little development in written performance over time has been reported in other studies, particularly with respect to the development of lexical sophistication, as measured by the use of less frequent words (Laufer, 1991; Horst & Collins, 2006). Then, concerning lexical depth, a number of features have been investigated within this area, including word association knowledge, morphological knowledge, spelling and meaning. However, due to the inconsistent findings obtained in different studies, no conclusive statement could be made, especially with regard to morphological knowledge (Horst & Collins, 2006; Schmitt, 1998; Schmitt & Meara, 1997), and word association knowledge (Crossley et al., 2009; Schmitt, 1998; Schmitt & Meara, 1997). Finally, although these studies have focused on the development of different types of vocabulary knowledge, they consistently suggest that different aspects of word knowledge may develop concurrently.

## Research Questions

In reviewing the available literature on L2 lexical development over time, it was found that first and foremost, several of the existing studies are small-scale projects involving a handful of learners, which limits the generalizability of results to other contexts (Crossley et al., 2009; Schmitt, 1998). Secondly, few studies have focused on the development of multiple dimensions of vocabulary knowledge (i.e. vocabulary size, lexical richness, and lexical depth), leaving unanswered the question of how the three dimensions of word knowledge may develop concurrently (Horst & Collins, 2006; Schmitt & Meara, 1997). Especially, the important role of collocational knowledge plays in learners' fluency and accuracy

developments requires more attention from L2 productive vocabulary research, to better address the question of how this aspect of vocabulary knowledge develop over time.

Finally, among the longitudinal studies investigating productive vocabulary development, spoken language and written language have been investigated separately. Research findings from L1 corpus studies have shown that vocabulary in written texts appears more diversified and varied than vocabulary in spoken texts (Halliday, 1989; Johansson, 2007; Nation, 2001), which means that native speakers tend to use more different words in writing than in speaking, even though it is suggested that this difference may be the result of formality and topic differences as much as modality differences (Nation, 2001). When it comes to L2 vocabulary development, it has long been suggested that a comparison between lexical development of spoken and written language of the same people would be an interesting issue (Laufer, 1998). Some studies have investigated this issue but only from a receptive perspective (Milton & Hopkins, 2006). Therefore, research investigating L2 productive vocabulary growth in both oral and written modalities is clearly needed.

Therefore, to fill the gaps found in previous research, the present study aims to contribute to the existing literature in the following ways. First, it will enrich the literature on L2 productive vocabulary development by focusing on beginning L2 learners in a large scale research project. Second, it will investigate the development of three dimensions of vocabulary knowledge simultaneously. One of these dimensions will include an important aspect of lexical depth – collocational knowledge – which has rarely been investigated in longitudinal vocabulary studies. Finally, there will be a focus on the development of both oral and written productive vocabulary.

As stated by Nation (2001, p. 362), vocabulary is not learned for its own sake; rather, the learning is supposed to help learners use words in communication, enabling them to listen, speak, read and write more effectively. Therefore, the targeted learners in the present study

are L2 learners in communicative classrooms. Moreover, the present study focuses on learners' productive vocabulary competence in actual usage rather than in de-contextualized tests. The objective of the present study is to gain a better understanding of how different aspects of productive vocabulary knowledge develop concurrently for beginning learners in communicative classrooms. The findings are expected to result in pedagogical suggestions concerning vocabulary learning and teaching in communicative classroom contexts. The study is guided by the following research questions:

For young beginning ESL learners in communicative classroom contexts:

1. How does their productive vocabulary develop over time with regard to vocabulary size, lexical richness, and lexical depth?

2. What similarities or differences can be observed between written vocabulary development and spoken vocabulary development?

With regard to the first research question, findings from previous studies seem to suggest that for beginning learners, an increase in written vocabulary size could be expected with an increasing amount of L2 experience (Horst & Collins, 2006; Palmberg, 1987). Concerning the nature of the words acquired, there may not be substantial development in learners' use of more advanced words, namely, low-frequency words, at least with regard to written production; however, the words may tend to be more morphologically diversified (Horst & Collins, 2006). In terms of spoken vocabulary, learners may show a tendency to use more diversified words over time (Bulte et al., 2008; Crossley et al., 2009).

Concerning the second research question, there has been insufficient research focusing on the comparison between L2 oral and written vocabulary development in the same group of people. Therefore no specific predictions regarding differences in spoken and written vocabulary development could be made at this time. However, based on L1 vocabulary research, there is a possibility that beginning L2 learners may follow an L1 developmental

pattern, which involves a more varied vocabulary use in writing than in speaking.

CHAPTER 3: METHODOLOGY

The study reported here analyzes a subset of the data from a larger longitudinal research project undertaken by Collins and White (2011) which was designed to assess the relative effectiveness of different distributions of intensive ESL instruction in Quebec. The present study focuses on the longitudinal L2 development of vocabulary size, lexical richness and lexical depth of French speaking pupils learning English in the province of Quebec. This chapter provides information on the design and implementation of the study. It starts with the description of the participants and contexts, which is followed by a detailed description of data collection, and ends with an explanation of data analyses.

Participants and Contexts

One hundred and eight francophone Grade 6 children (aged 11-12 years) enrolled in French elementary schools in the French-speaking province of Quebec took part in the study. The learners began ESL learning from Grade 3 (aged 8 years), and had received approximately an hour of regular limited-exposure ESL instruction per week for 3 years before the study began (approximately 35 hours a year); therefore, they could be classified as beginning learners of English. During the period covered by the study, the participants were participating in intensive ESL programs in which they devoted close to half of their regular school year (approximately 400 hours) to ESL learning. The intensive ESL programs in Quebec are special in that they, unlike immersion programs, are not content-based. The regular Grade 6 curriculum, namely, the regular academic curriculum (e.g., math and social studies) is completed in French in a condensed format, and the rest of the school year is allocated to ESL learning only (for detailed discussions of intensive ESL, see Collins, Halter, Lightbown, & Spada, 1999; Spada & Lightbown, 1989). All participants were from nine intact classes in three schools. The schools were located in predominantly French-speaking

communities in two towns, each about one hour outside of the city of Montreal. In these contexts, the learning of English could be considered as foreign language learning because there were few opportunities for exposure to English outside of classroom. All students were tested at the beginning of the intensive ESL program to establish that they were similar in terms of their English proficiency level.

The classes of the intensive ESL programs were taught by seven trained and experienced ESL teachers who were all proficient English speakers. The teachers all followed a theme-based approach, which was meaning-focused in nature and targeted the development of learners' communicative skills, including speaking and listening skills.

Data Collection

This section is divided into two main parts: an explanation of the instruments used in the study and a description of how the data were collected.

*Instruments*

As mentioned above, the type of competence targeted by the intensive ESL program in Quebec is communicative effectiveness, namely, the ability to use the target language in communicative situations. Therefore, to keep construct validity, the research method selected for the study aimed to measure vocabulary knowledge in actual usage, namely, their procedural knowledge: learners' ability to use words productively in writing or speaking when they are focusing on the message or meaning they are trying to convey (Nation, 2001). Hence, two main instruments were designed and used in the study to elicit productive vocabulary knowledge in writing and speaking: a picture prompted written narrative task and a paired role-play oral task (developed for the Barcelona Age Factor Project, Muñoz, 2006). Both of the instruments had been used in previous studies with students of the same age and proficiency level.

All participants were pretested at the beginning of the intensive ESL program. Then, they were tested four more times at 100-hour intervals during their programs: after 100, 200, 300 and 400 hours of instruction. For the purpose of the present project, only the data from 200 (Time 1) and 400 hours (Time 2) of instruction will be analyzed. The reason for this is that the same kinds of speaking and writing tasks were used only at 200-hour and 400-hour testing sessions. Making comparisons across identical tasks ensures the validity of the longitudinal analysis of the results, and also helps compare the two modalities at each testing time. The data collection schedule is presented in Table 2.

Table 2
*Data Collection Schedule*

| T 1 (200 hours) | T 2 (400 hours) |
|---|---|
| Picture-prompted written narrative task | Picture-prompted written narrative task |
| Paired role-play oral task | Paired role-play oral task |

*Picture-prompted written narrative task*

At Time 1 and Time 2, participants were presented with a picture and asked to write a narrative based on the information in the picture. In order to make the task more interesting and to avoid possible familiarity effects, a new picture prompt was chosen and used in each testing session based on consultations with the ESL teachers and knowledge of the general vocabulary themes that the learners encountered at different points in the program. The first picture shows a little girl, her mother and a doctor. It requires some knowledge of words for family members, body parts, and occupations. The second picture shows a girl and two boys standing on the school playground. The instructions for the prompts were the same for all pictures: *imagine what is happening now, what happened before, and what is going to happen next*. Learners were given approximately 20 minutes to complete the task. The use of dictionaries was not permitted. When learners did not know the English words they wanted to

use in their narratives, they were allowed to use French words instead. All handwritten

narratives were then transcribed exactly as they had been written for future analysis.

*Paired role-play oral task*

At Time 1 and Time 2, the participants were paired up to complete two versions of an

oral task. At Time 1, one learner playing a child negotiated with another learner playing a

parent over having a party. At Time 2, the negotiation was changed to getting a pet. Each time

they were given two minutes to negotiate with their partner and to figure out a possible

solution. The tasks were recorded, and then transcribed for future analysis.

## Measures and Data Processing

### *Measures*

*Vocabulary Size and Lexical Richness*

Vocabprofile (LFP, Laufer & Nation, 1995) was selected to measure vocabulary size

and lexical richness for both writing and speaking. The Vocabprofile option used in the

present study is the BNC-based frequency lists (*British National Corpus*, which has a

100-million-word collection of samples of written and spoken language from a wide range of

sources; see http://www.natcorp.ox.ac.uk/corpus/index.xml for a good introduction). The

Vocabprofile BNC-20 program[1] is based on the relative frequency of words in the language

and involves calculating the percentage of word families in a given corpus which belong to

20 frequency bands (K1 most frequent families, K2 most frequent families, … K20 most

frequent families). The Vocabprofile analysis assumes that as learners improve in proficiency

level and fluency, they are likely to increase the proportion of low-frequency words (K3+)

they use in production. Some problems have been reported in the literature regarding the

validity of Vocabprofile. For example, Meara (2005) argued that Vocabprofile measures may

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[1] The BNC-based Vocabprofile is available on Cobb's (2000) Lextutor website
http://www.lextutor.ca/.

work much less well in distinguishing between evenly matched proficiency groups than in discriminating between lower level learners and very advanced learners, and that Vocabprofile measures are less sensitive in assessing learners' large productive vocabulary size (e.g. between 7,500-word and 8,000-word vocabularies) than to small vocabulary size (e.g. between 2,500-word and 3,000-word vocabularies).

Despite the problems mentioned above, previous research has provided support for the suitability and effectiveness of using Vocabprofile measures for assessing learners' lexical development (Laufer, 1994, 1998; Laufer & Nation, 1995; Laufer & Paribakht, 1998). In addition to the frequency measures, Vocabprofile also reports other information about type token ratio (TTR), types per family along with counts of types, tokens and families. Laufer and Nation (1995) argued Vocabprofile can provide an objective measure of lexical richness in that it draws on a range of widely recognized word lists to classify the words into categories, and hence it allows for useful comparisons of lexical growth across types of learning and research contexts and is unaffected by task.

Moreover, although Vocabprofile was devised as a measure of lexical richness, it was also found to be a reliable and valid measure of how vocabulary size is reflected in language use (Laufer & Nation, 1995). Particularly, when the language is produced by a homogeneous group of non-native speakers of limited proficiency, a frequency count of words in a large corpus could provide a relatively reliable representation of vocabulary size in use (Nation, 2001, p.368; Edwards & Collins, 2011). In the case of the present study, the words in the written corpus, which was collected from 108 young beginning Quebec English L2 learners, were previously shown to be very basic (Collins & White, 2011; Horst & Collins, 2006). Therefore, the words in the spoken corpus were likely in the same frequency category, if not lower, as the ones in the written corpus. Thus, given this relationship between the participants' L2 proficiency and their L2 vocabulary size and richness, Vocabprofile tools

appear to be useful for assessing differences of lexical size and lexical richness not only

between different groups of learners or between learners at different levels of proficiency, but

also between different corpora (both spoken and written). Another advantage of using

Vocabprofile is that the automaticity of computerized tools allows the analysis of large

corpus-based data collected from a large population to be efficient.

*Lexical Depth*

With regard to lexical depth, the present study investigates morphological knowledge

(i.e., inflectional morphemes such as *–ed, -ly, -s, -er, -ed, -es, -est, -ing*, and derivational

morphemes such as *dis-, re-, in-, be-, en-, -ly, -ish -able*), operationalized as knowledge of

inflectional and derivational morphology. In addition, the present study purposely focuses on

a particular aspect of word knowledge that has rarely been investigated in longitudinal

research on productive L2 vocabulary development – collocational knowledge. In other

words, "lexical depth" in the present context was also operationalized as learners'

collocational knowledge in productive language use.

Providing a definition for "collocations" is challenging. Research on L2 collocation

knowledge and development has used a number of terms to refer to groups of sequences of

words. Some of the terms used include *formulaic sequences* (Schmitt, 2004), *prefabricated*

*units* (Nesselhauf, 2005), *chunks* (Lewis, 1993), and *lexical bundles* (Biber et al., 1999). Each

of these terms refers to different aspects of the same phenomenon, which often results in

methodological differences in different studies. Nation (2001) lists 10 different criteria to

classify collocations. In broad terms, however, there are two main approaches, which can be

referred to as the phraseological and the frequency-based traditions (Barfield & Gyllstad,

2009). Within the field of corpus linguistics, which informs the present investigation,

collocation studies generally favoured the second tradition, investigating collocation as a

quantitative phenomenon that can be observed systematically through computational analysis

of large corpora of authentic language data (Barnbrook, 2007; Biber, Conrad, & Reppen, 1998; Sinclair, 1991, 2003; Grainger, 1998). A common approach used in frequency-based collocation studies is the lexical bundle approach (Biber & Conrad, 1999; Biber, Conrad, & Cortes, 2003; Reppen, 2009), in which a collocation is defined, using Sinclair's (1991) terms, as a tendency for words to occur together and identifiable by frequency of occurrence. Normally, lexical bundles are identified through the use of a computer program as the recurring word sequences of the length that has been specified by the researcher (e.g. 2, 3, 4, or 5 words).

Since lexical bundles are empirically identified by the use of a computer program instead of a researcher identifying phrases that are noticeable in discourse and then searching for those sequences, they have been criticized for being under-theorized and insensitive to constituency and positional size as objects of analysis (Kjellmer, 1982, cited in Nation 2001). For example, although two items may occur together frequently enough as a lexical bundle (e.g., *of th*e and *bit too*), they may not form a meaningful collocation. Nonetheless, lexical bundles are now regarded widely as "an important component of fluent linguistic production and a key factor in successful language learning" (Groom, 2009, p. 23). In addition, since the aim of the present study is to investigate learners' language in communication situations, a lexical bundle analysis appears to be an appropriate approach in that lexical bundles emerge from the corpus itself rather than from the researchers' preconceived ideas as a starting point (Moon, 1998). Moreover, using computer programs to abstract collocations, in place of manual abstraction, enables the analysis of large corpora to be practical and efficient. Accordingly, it would seem reasonable for the present study to adopt lexical bundles as a measure of L2 collocation development.

The other key issue that needs to be addressed before discussing the corpus data is how the lexical bundles analysis is to be interpreted as a measure of collocational development,

namely, in terms of the relationship between the number of lexical bundles (types and/or tokens) found in a corpus and the level of development achieved by the learners.

Does more mean better? While some corpus-based studies of L2 collocation usage found that L2 learners at all proficiency levels under-produce collocations in written production compared to native speakers (Altenberg & Granger, 2001; Laufer & Waldman, 2011; Howarth, 1996), other authors who targeted high proficiency-level L2 learners found that intermediate- to advanced-level L2 learner corpora consistently contain more lexical bundle types and tokens than comparable L1 corpora do (De Cock, 1998, 2004; Milton, 1998; Lenko-Szymanska, 2008). The reasons for this "overuse" of lexical bundles have not been fully understood. It is hypothesized that advanced L2 learners may experience a process of gradual downwards adjustment from overuse of collocation towards native speaker norms when their exposure to the target language increases, as they are using fixed phrases more creatively (Groom, 2009), which counterintuitively implies that fewer may actually mean better. This assumption was further confirmed by Reppen (2009), who explored the writing development of elementary students writing in their L2. Whether this assumption is true or not with regard to low-level learners cannot be decided yet. However, based on the previous literature, the overall number of lexical bundles was indeed shown to decrease as proficiency in the language increases. Therefore, for the current study, fewer lexical bundles (expressed as either types or tokens) in the corpus over time will be considered as a more advanced level of collocational development for learners.

### *Data Processing*

In preparation for the analysis of the learner corpus, transcriptions of each testing session were altered and modified. With respect to written production, transcriptions were modified in the following ways: all proper names (e.g. Barbie, Rosemary, etc.) were manually removed from the texts. Errors that are obvious misspellings, such as *pwesonal* and

*kik*, were corrected to *personal* and *kick* to ensure that the Vocabprofile program would process them as English words instead of off-list words. All French words were identified and tagged with the suffix *French* (e.g. *vent → ventFrench*) to avoid these words being labeled as English. Grammar errors, such as agreement errors (i.e. *she like go at hospital*), were not corrected. The transcript of each testing session for each student was saved as a single text file.

In terms of spoken production, transcriptions were modified in the following ways. The spoken corpus was transcribed to include only students' speech (excluding interviewer comments and asides). Interjections such as uh, um were deleted, as were any words that were obviously not English words, such as words in French or word fragments (e.g. *wh-, fr-,* etc.). All punctuation except the comma, period, question mark, and exclamation mark was eliminated from the transcriptions. The transcript of each testing session was saved as a single text file, and each text file was manually and electronically checked for spelling.

After all the transcriptions had been edited in the manner described above, the data from the picture-prompted written narrative tasks and the paired role-play oral tasks at Time 1 and Time 2 were organized into four comparable corpora totaling approximately 86,000 words. Table 3 shows an overview of each corpus.

Table 3
*Corpus Size in Numbers of Words at Two Testing Times*

|           | T1 (200 hours) | T2 (400 hours) |
|-----------|----------------|----------------|
| Written   | 25,000         | 33,000         |
| Spoken    | 13,000         | 15,000         |

To ensure that "by-subject" statistical analyses were possible, the following procedures were applied. Each written corpus was divided into shorter passages, and each passage consisted of four randomly selected narrative samples produced by four learners. Each oral corpus was similarly divided into shorter passages consisting of two role-play transcripts

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from two randomly selected pairs. An additional reason for dividing the four corpora into smaller passages include the suggestion by Laufer and Nation (1995) that the minimum length required for reliable Vocabprofile measurement should be 200 words. The written narratives and oral transcripts therefore could not be treated individually (i.e. by using a single learner's text or a pair of learners' oral narrative) because most of the individual narratives and paired role-play transcripts were well under the 200-word threshold. In the written corpus, the four-part passages ranged in length from 241 to 810 words, with the mean length of 430 words ($SD = 119$). In the oral corpus, the two-part passages ranged in length from 391 to 818 words, with the mean length of 473 words ($SD = 81$). After these adjustments, all passages in the four corpora were above the 200 word criterion in terms of word length. The number and length of spoken and written passages are summarized in Table 4.

Table 4
*Number of Passages and Sizes of Passages in Number of Words*

|  | T1 (200 hours) | T2 (400 hours) |
|---|---|---|
| Number of written passages | 65 | 70 |
| Written Mean (*SD*) | 385 (77) | 471 (134) |
| Written Range | 241-723 | 289-810 |
| Number of spoken passages | 29 | 32 |
| Spoken Mean (*SD*) | 465 (92) | 482(71) |
| Spoken Range | 391-818 | 398-680 |

Each of the four corpora were run separately using the Vocabprofile program to obtain information about learners' lexical richness and their vocabulary size. Vocabulary size was counted as the number of word families contained in each corpus. For example, *employ, employer,* and *employment* were considered as one "word". Lexical richness was investigated as the proportions of 1K, 2K and 3K+ words in each of the corpus, which could provide information of how the learners developed in using frequent words (1K and 2K) and more advanced words (K3+) over time.

Lexical depth was firstly studied within the aspect of inflectional and derivational knowledge, using the measure of types per family in each corpus to see whether learners used more inflectional and derivational forms of a word at T2 than at T1. Lexical depth was further investigated through learners' use of lexical bundles in each task. The four corpora were run separately using the N-Gram Phrase Extractor, part of the online corpus tool available through the Compleat Lexical Tutor[2], to obtain the counts of well-formed 2-word, 3-word, 4-word, and 5-word verb and noun lexical bundles in each corpus.

Since the total number of words varied for each segment, it was necessary to convert the raw counts to normalized counts so that accurate comparisons could be made. Therefore, the cut-off point for analyses was set at a level of 10 occurrences per 10,000 words. The formula used in this normalization procedure was: normalized count = (raw count/total number of words)*10,000. In addition, to avoid the influences of idiolectal preferences, any given lexical bundle had to appear at least five times in each segment produced by four learners to be counted in the analysis.

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[2] N-Gram is a free online concordance program that can be used for abstracting n-word lexical bundles in a given corpora. It is available at http://lextutor.ca/tuples/eng/

CHAPTER 4: ANAYSES AND RESULTS

This chapter summarizes the results of longitudinal and between-modality (i.e. oral vs. written) comparisons of vocabulary knowledge in young francophone learners of English. The objectives of the present study are recapitulated first. The results of statistical analyses are then presented with regard to different aspects of productive vocabulary knowledge: a) vocabulary size, b) vocabulary richness, and c) vocabulary depth.

Main Objectives

The objectives of the present study were, first, to investigate how young L2 learners' productive vocabulary develops over time with regard to vocabulary size, its richness, and depth. Second, the present study also aimed to examine possible differences between the development of productive vocabulary in the oral and written modality. To address both these objectives, the four learner corpora (written and oral at T1 and T2) were compared using two-way analyses of variance (ANOVAs) with modality (written vs. oral) and time (T1, T2) as between-participant factors.

Vocabulary Size

*Data Analyses*

The development of vocabulary size was operationalized as an increase in the number of word families over time (i.e., between T1 and T2). This is consistent with at least one method of measuring vocabulary size, which involves collecting a corpus of language used by a person or a group of people and computing the number of distinct word families in it (Nation, 2001, p.363). Given that a corpus can only represent a part of L2 learners' vocabulary, this method may not yield an estimate of the total vocabulary size. However, because the main purpose of the present study is to document a relative growth in the number

of words used by learners in writing or speaking, rather than to estimate the total vocabulary size, the corpus-based method can give a fairly clear picture of how learners' vocabulary size develops. Therefore, to investigate learners' development in productive vocabulary size, each spoken or written sample was analyzed using the Vocabprofile BNC-20 program to obtain the count of word families in it. Then, these counts were submitted to two-way ANOVAs to determine if there were any differences across time and modality in number of word families used.

<p style="text-align:center;">*Results*</p>

Table 5 summarizes the means for word families contained in each of the four corpora. The two-way ANOVA revealed a significant main effect of modality, $F(1, 193) = 20.40$, $p < .000$, a significant main effect of time, $F(1, 193) = 10.74$, $p = .001$, and also a significant modality × time interaction, $F(1, 193) = 5.38$, $p = .021$. The significant interaction was further explored using tests of interaction effects with a Bonferroni adjustment ($\alpha = .0125$). These tests showed that learners produced significantly more word families in written production at T2 than at T1 ($p < .000$), but that there was no similar increase in oral production over time. The tests also indicated that there was no significant difference in number of word families produced in written and oral production at T1. However as learners progressed through the program, they generated significantly more word families in written than in oral production at T2 ($p < .000$). These results are illustrated in Figure 1.

Table 5
*Means and Standard Deviations (in parentheses) of Word Families in Each Sample in Each of The Four Corpora at T1 and T2*

| Corpus | T1 (200 hours) | T2 (400 hours) |
|---|---|---|
| Written | 110 (20) | 128(28) |
| Spoken | 102 (10) | 105 (9) |
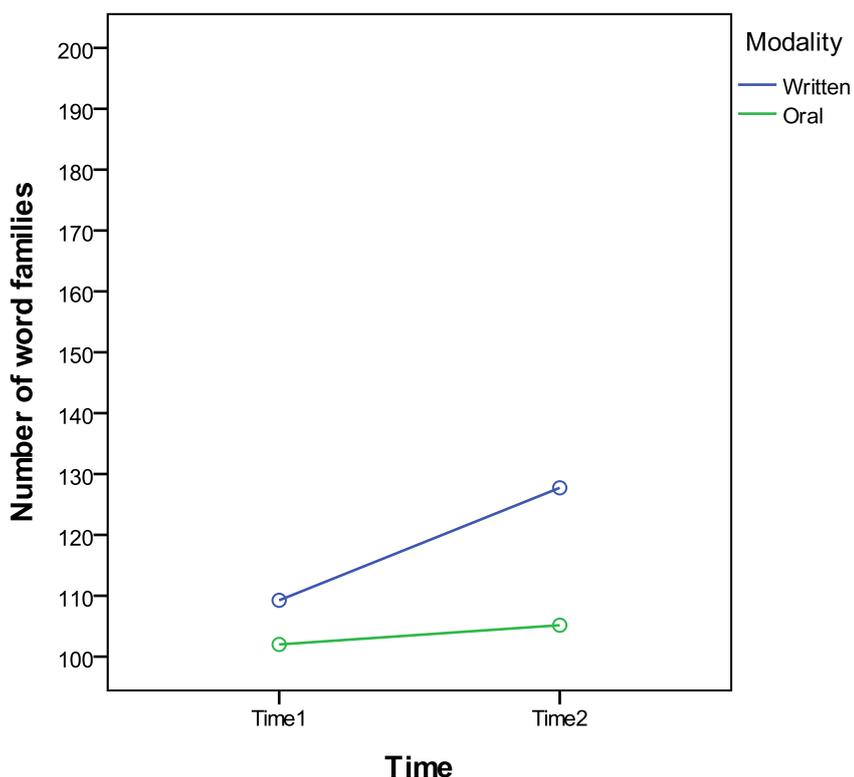
Figure 1.
*Mean Number of Word Families as A Function of Time and Modality*


Vocabulary Richness

*Data Analyses*

Measures of lexical richness in the present study included proportions of 1K (1,000),

2K (2,000), and 3K+ (3,000 and above) most frequent words in the English language.

Answering the question about how learners' productive lexical richness developed over time

involved the use of the Vocabprofile BNC-20 program to determine the levels of coverage

offered by each of 20 frequency lists (e.g. 1K, 2K, … 20K) for the four corpora. This

approach assumes that learners tend to increasingly use less frequent words (i.e. 3K+ words)

as they progress in their ESL program. These measures were first calculated separately for

each sample in the oral and written corpora (see Table 6 for a summary) by using the

Vocabprofile BNC-20 program, and were then compared across the two testing sessions and the two different modalities using separate two-way ANOVAs.

Table 6
*Means and Standard Deviations (in parentheses) of The Percentage of K1, K2 and K3+ Words in Each Corpus at T1 and T2*

| Corpus | | T1 (200 hours) | T2 (400 hours) |
|---|---|---|---|
| Written | K1 | 88.96 (4.78) | 90.74 (2.69) |
| | K2 | 2.79 (1.11) | 2.99 (1.08) |
| | K3+ | 2.18 (1.01) | 3.26 (1.19) |
| Spoken | K1 | 96.79 (1.21) | 93.96 (1.98) |
| | K2 | 2.38 (.94) | 1.58 (.89) |
| | K3+ | .68 (.67) | 3.04 (1.58) |

*Results*

*1,000 Level Word Coverage*

The ANOVA comparing the proportions of 1K level words in both the written and oral productions across the two test intervals revealed a significant main effect of modality, $F(1, 193) = 134.09$, $p < .000$, a significant modality × time interaction, $F(1, 193) = 11.97$, $p = .001$, but no significant main effect of time, $F(1, 193) = .01$, $p > .05$. Tests of interaction effects ($\alpha = .0125$), however, showed that the only significant difference was across modality. The learners used more K1 words in oral than in written production both at T1 and T2 ($p < .000$). These results are depicted graphically in Figure 2.
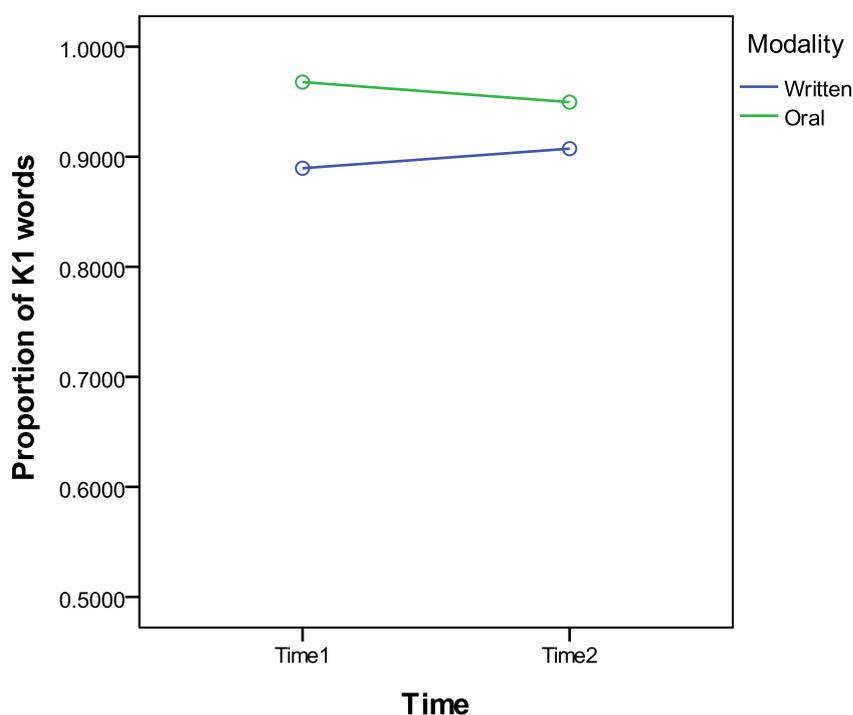
Figure 2

*Mean Proportion of K1 Words as A Function of Time and Modality*

*2,000 Level Words Coverage*

The proportions of 2K level words in the oral and written data were compared using a similar two-way ANOVA. This analysis revealed a significant main effect of modality, $F(1, 193) = 31.19$, $p < .000$, a significant modality × time interaction, $F(1, 193) = 9.26$, $p = .003$, but no significant main effect of time, $F(1, 193) = 3.32$, $p > .05$. Tests of interaction effects ($\alpha = .0125$) showed that overall learners used more K2 words in written production than in oral production, but that the difference was only significant at T2 ($p < .000$). What is worth noting, however, is that as the learners progressed in their ESL program, they used significantly fewer proportion of K2 words in oral production over time ($p = .004$), but that there was no such decrease in written production. These findings are illustrated in Figure 3.
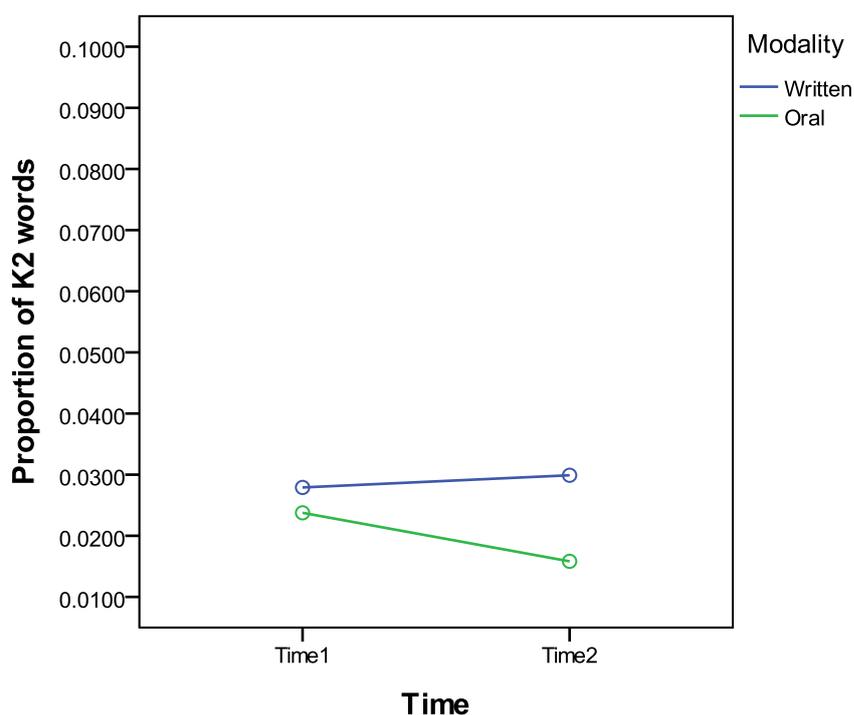
Figure 3

*Mean Proportion of K2 Words as A Function of Time and Modality*

*3,000 Level and Above Words Coverage*

The proportions of 3K+ level words in the written and oral data were compared using a similar two-way ANOVA. This analysis yielded a significant main effect of modality, $F(1, 193) = 20.68$, $p < .000$, a significant main effect of time, $F(1, 193) = 85.45$, $p < .000$, and a significant effect of modality × time interaction, $F(1, 193) = 11.02$, $p = .001$. Tests of interaction effects ($\alpha = .0125$) further showed that the learners used significantly more K3+ words at T2 than at T1 in both written and oral production ($p < .000$). These tests also showed that the learners overall used more K3+ words in written production than in oral production, but that the difference was only significant at T1 ($p < .000$) not at T2. The results were illustrated in Figure 4.
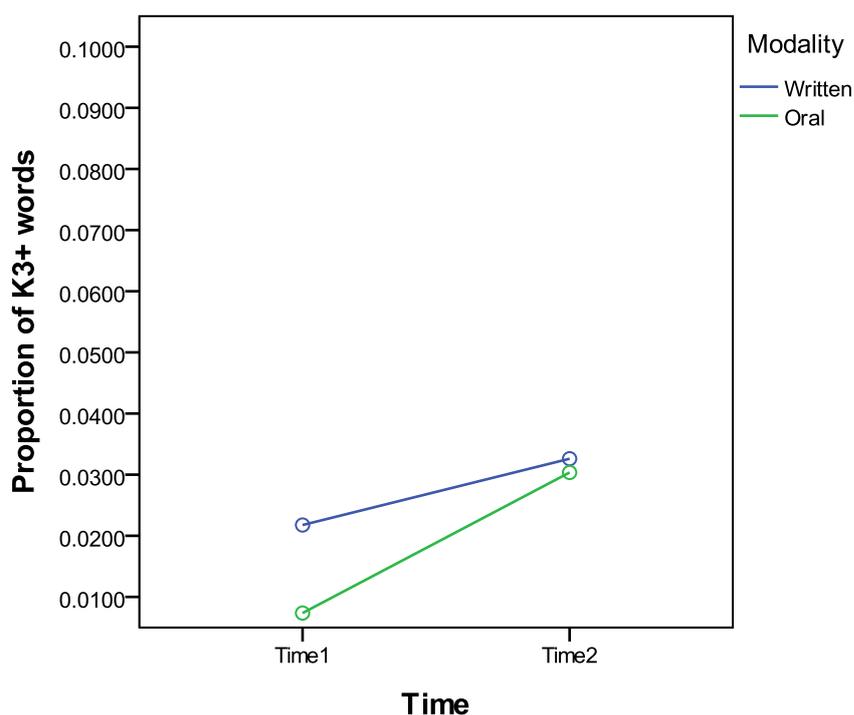
Figure 4
*Mean Proportion of K3 Words as A Function of Time and Modality*

Lexical Depth

*Data Analyses*

There were two measures of lexical depth. The first measure was type-family ratio,

used as an estimate of how the learners developed with regard to morphological size of forms

(i.e. use of forms such a*s take, takes, taking, taker,* etc.). Type-family ratios for the four

corpora were obtained by analyzing all samples in Vocabprofile, developed and tested by

Laufer and Nation (1995) and available on Cobb's (2000) Lextutor website. Summary

statistics for this measure appear in Table 7.

Table 7

*Means and Standard Deviations (in parentheses) of Types per Family in Each Corpus at T1 and T2*

| Corpus | T1(200 hours) | T2(400 hours) |
|---|---|---|
| Written | 1.15 (0.04) | 1.21 (0.05) |
| Spoken | 1.14 (0.03) | 1.12 (0.03) |

The second measure was the number of lexical bundles used by the learners in speaking and writing. As was discussed in Chapter Three, lexical bundles were defined as the tendency for words to occur together identifiable by frequency of occurrence (Sinclair, 1991). This measure was used as an estimate of the learners' development in terms of their collocational knowledge (phraseological structure) in English. To calculate the number of lexical bundles in each sample, each sample was analyzed using the *N-Gram*, an online concordance program which can be used to identify n-word lexical bundles in a given corpora. Then, the counts for 5-, 4-, 3-, and 2-word well-formed lexical bundles consisting of verb and noun phrases (e.g., *have a dog*, *a blue puppy*, *choose the*, *a mouse*) were obtained manually. Initial *N-Gram* analyses revealed that the occurrences of 5, 4, and 3 word bundles in each corpus were rare (i.e., they accounted for fewer than 10% of the total number of bundles revealed). Therefore, only 2-word lexical bundles (e.g. *buy the, a cage, have a,* etc.) were analyzed statistically. Table 8 shows the statistical summary of 2-word lexical bundles obtained in each corpus, and Table 9 lists the lexical bundles identified in each corpus, with noun-based lexical bundles presented first, then followed by verb-based ones. Lexical bundles highlighted in bolded fonts are the ones that occurred both at T1 and T2 in each modality.

Table 8

*Means and Standard Deviations (in parentheses) of Normalized Counts of 2-word Lexical Bundles in Each Corpus*

| Corpus | T1 (200 hours) | T2 (400 hours) |
|---|---|---|
| Written | 59.30 (36.63) | 29.19 (25.11) |
| Spoken | 82.52 (37.40) | 95.79 (48.65) |

Table 9

*2-word Verb and Noun Lexical Bundles by The Participants by Time and Modalities*

| Written | | Spoken | |
|---|---|---|---|
| T1: 23 types | T2: 22 types | T1: 20 types | T2: 28 types |
| **the girl** | **the girl** | the party | **the food** |
| the doctor | the boy | the grandma | the pet |
| the hospital | the school | **the food** | the cage |
| the bedroom | the principal | the music | the mouse |
| the bed | the group | my house | your father |
| the chicken | the supervisor | my friend | good idea |
| small girl | the teacher | your house | pet shop |
| **little girl** | **little girl** | a party | a dog |
| her grandma | little boy | big party | a cat |
| her friends | a boy | next week | a horse |
| her mother | a girl | at home | a fish |
| my sister | at school | **have a** | a snake |
| at hospital | give a | clean the | a rabbit |
| go to | want to | go to | choose the |
| go at | start to | come on | **have a** |
| **have a** | said to | I have | want a |
| has a | said that | I know | want to |
| feel good | fight with | you say | like to |
| I have | **have a** | **you have** | have to |
| girl is | she said | you know | pay the |
| she is | **she was** | | take care |
| **she was** | it was | | I choose |
| she said | | | I want |
| | | | I know |
| | | | **you have** |
| | | | you want |
| | | | you buy |
| | | | you pay |

*Note. Lexical bundles that occurred both at T1 and T2 in each modality are highlighted in bolded fonts.*

### Results

*Type-family Ratio*

The type-family ratios obtained from the four corpora were submitted to a two-way

ANOVA which yielded a significant main effect of modality, $F(1, 193) = 67.12$ $p < .000$, a significant main effect of time, $F(1, 193) = 14.87$, $p < .000$, and also a significant modality × time interaction, $F(1, 193) = 45.40$, $p < .000$. Tests of interaction effects used to explore the significant interaction ($α = .0125$) indicated that the type-family ratio in written production was significantly higher at T2 than at T1 ($p < .000$), which means that learners used considerably more inflectional and derivational forms of a word at T2 than at T1. However, there was no significant difference in learners' oral production over time. These tests also showed that at T2 (but not at T1) the type-family ratio was significantly higher in learners' written than in oral production ($p < .000$), suggesting that learners used substantially more inflectional and derivational forms of a word in written than in oral production at T2. These results are illustrated in Figure 5.
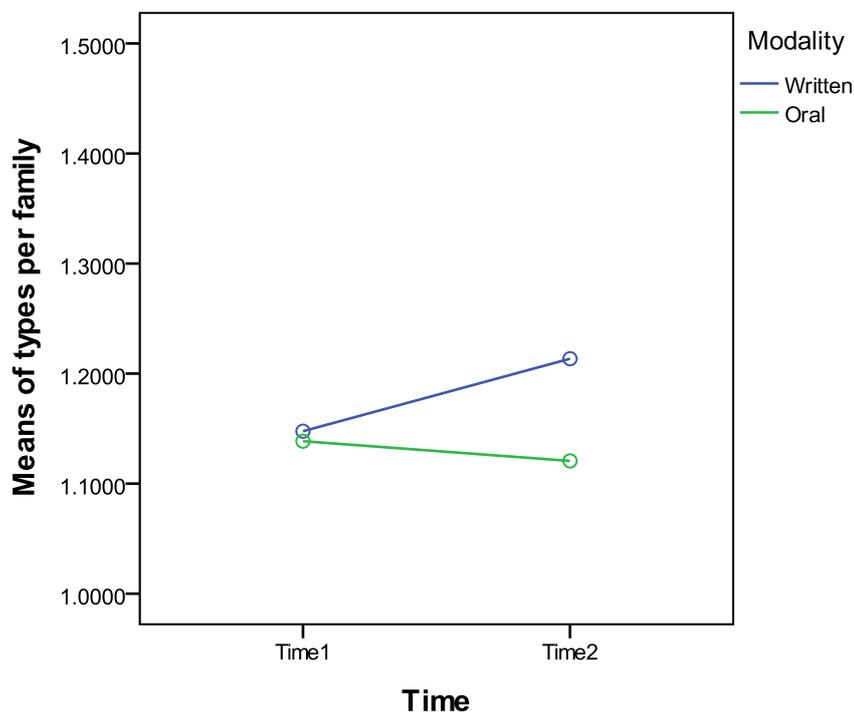


Figure 5
*Mean Number of Types-per-family as A Function of Time and Modality*

*Lexical Bundles*

Lexical depth was then investigated by comparing the learners' use of lexical bundles across time and modality. The means for 2-word lexical bundles in both oral and written corpora were submitted to a two-way ANOVA, which yielded a significant main effect of modality, $F (1, 193) = 65.72$, $p < .000$, a significant modality × time interaction, $F(1, 193) = 16.50$, $p < .000$, but no significant main effect of time, $F(1, 193) = 2.73$, $p > .05$. Tests of interaction effects ($\alpha = .0125$) showed that there was a substantial decrease in using 2-word lexical bundles in written production over time ($p < .000$), while no significant change was observed in oral production. These tests also indicated that learners consistently produced more 2-word lexical bundles in oral than in written production, both at T1 ($p = .006$) and at T2 ($p < .000$). These results are illustrated in Figure 6.
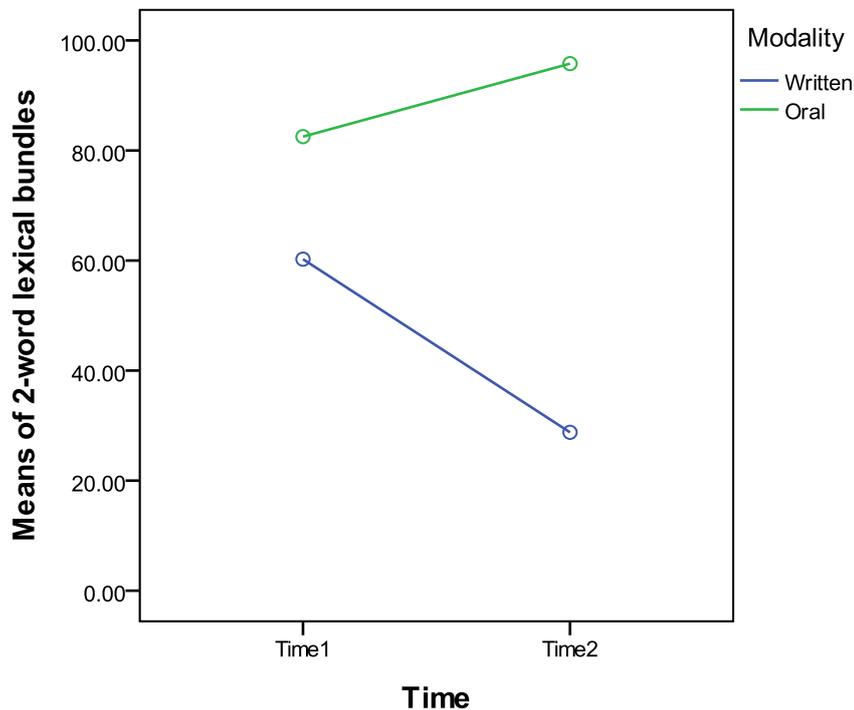


Figure 6
*Mean Number of 2-word Lexical Bundles as A Function of Time and Modality*

Summary of Findings

The main findings reported thus far can be summarized as follows: results regarding a) written vocabulary development and b) spoken vocabulary development in terms of vocabulary size, richness and depth.

In terms of written vocabulary, the learners' production overall demonstrated significant developments over time in size, richness, and depth. The statistical results indicated a significant growth in the learners' vocabulary size, measured as the number of word families used. Results also showed that the learners tended to use a greater proportion of less frequent (K3+ level) words in writing, suggesting an increase in vocabulary richness. As for vocabulary depth, the learners showed increased morphological knowledge which enabled them to use different forms of a word to express several kinds of grammatical relationships in writing. Also, the decrease in the number of 2-word lexical bundles used in writing over time suggested a more advanced level of collocational development for the learners at T2 than at T1.

However, with regard to spoken vocabulary, a significant improvement over time emerged in vocabulary richness only. Statistical results showed that the learners' use of relatively less frequent words (i.e., K3+ words) in spoken production significantly increased over time as their use of relatively more frequent words (2K level) decreased over time. Nonetheless, the learners did not demonstrate any significant improvement in their vocabulary size or their morphological and collocational knowledge.

With respect to comparisons of vocabulary development across the two modalities (i.e. written and spoken), the learners appeared to consistently perform better in vocabulary size in writing than in speaking. Regarding richness, overall, the learners generated significantly more frequent (K1 level) words in spoken than in written production, and also tended to use a greater number of K3+ words both in writing and in speaking. In terms of vocabulary depth,

the learners did not seem to differ across modality in terms of morphological size at T1. However, their written production outperformed their oral production at T2 by showing more inflectional and derivational forms of a word. Finally, with respect to collocational knowledge, the learners improved in writing but not in speaking, and overall tended to perform better in writing than in speaking regardless of testing time.

CHAPTER 5 DISCUSSION

This chapter is devoted to summarizing and discussing the findings of the current study. The results are discussed separately for each research question stated in Chapter Two. In each section, the research question is first restated and then the results relevant to the question are addressed. A summary of the discussion is provided in the final section of this chapter.

Research Question 1

How does Quebec ESL learners' productive vocabulary develop over time with regard to vocabulary size, lexical richness, and vocabulary depth?

*Written Vocabulary Development*

The results revealed that the learners used more vocabulary in writing (18 word families more per sample) after 200 hours of classroom instruction. This finding is consistent with Horst and Collins's (2006) finding from the same population of learners. Both Horst and Collins and the present study showed that the number of word families used in learners' written production increased significantly over time as learners progressed through the intensive ESL program. Admittedly, the measure used in the present study could not provide a full picture of how learners' overall vocabulary size develops. However, the growth in the number of word families produced by the learners in this study is consistent with a steady growth in overall vocabulary size reported in previous research (Nadarajan, 2009; Schmitt & Meara, 1998).

However, with regard to lexical richness, the findings of the present study appear to differ from the results of previous research. In the current study, lexical richness was measured as the proportions of 1K, 2K and 3K+ words in each of the corpora, which aimed to obtain information on how learners developed in using more advanced words (3K+) over time. It was hypothesized that there might not be substantial development in learners' usage

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of more advanced words, and that instead learners would progress by using a larger proportion of high-frequency words in their production, as was found in Horst and Collins (2006). In contrast, the results of this study revealed that learners did not change substantially in using relatively more frequent words (1K and 2K level), but that they incorporated increasing amounts of relatively "advanced" vocabulary (3K+ level, e.g., *monster, thief, jail, punch*) into their written production over 200 hours of intensive instruction.

The major difference between the study by Horst and Collins (2006) and the present study with regard to the measure of lexical richness is that in this study the BNC-20 Vocabprofile program was used to calculate the percentage of word families belonging to 20 frequency bands, while Horst and Collins used the classic Vocabprofile program which categorized the word families into four frequency bands only (1K, 2K, AWL, and off-list words). Therefore, at least one reason for this discrepancy in findings across the two studies is likely due to the different frequency lists used. Some researchers have in fact questioned the accuracy of the frequency information that adult language-based word lists provide for child language learners' corpora (Snellings, Van Gelderen, & De Glopper, 2002). Horst and Collins similarly pointed out the need to use age-appropriate frequency lists to better measure and identify lexical richness development. A Vocabprofile tool VP-Kids (which is also available at Lextutor website) is a good example of age-specific frequency program that might be more sensitive in identifying young children's lexical growth than the regular Vocabprofile program.

By applying a set of different frequency lists, the present study shed light on this issue. Comparing the BNC-20 Vocabprofile and the classic Vocabprofile, for example, while words like *intelligent* and *adult* were categorized into AWL frequency band in the classic program, they were grouped under the K2 level (2,000 most frequent word families) in the BNC-20 version. Other examples are words like *punch*, *jail*, and *harmony*. They all fell under the

off-list words category in the classic program. However in the BNC-20 version, they were grouped as K3, K4 and K5 words, respectively. It appears, therefore, that using a set of more clearly distinguishable frequency lists (such as BNC-20) can make subtle and small differences in vocabulary richness detectable through corpus-bases analyses.

What is worth noting is that, although not by much, the proportion of 1K and 2K words in learners' written corpus also increased after 200 hours of instruction. Taking together the increase of word families used into consideration, the learners in fact not only developed in using more low-frequency words, but also did they use a greater variety of the first 2K frequent words, which partly confirmed the findings in Horst and Collins that the learners used more common 1K words as their English developed rather than relying on French cognates which are often among the less frequent words. As was discussed in Chapter 3, the young ESL learner's vocabulary knowledge was very basic, and to them the knowledge of the most frequent 2K words is fundamentally important in that it would enable the learners to recognize about 80% of the words in any normal text (Nation, 2001, cited in Milton, 2009, p. 47). Therefore, the increasing knowledge of the first 2K frequent words was also believed to be a sign of the development of lexical richness.

As for vocabulary depth, the results detected an increase in the variety of morphological forms of words the learners were able to use in written production, which was quite consistent with what Horst and Collins reported. In other words, the learners showed an increase in ability to use different forms of a word to express different types of grammatical relationships (i.e., *boy* vs. *boys*, *want* vs. *wants*, *start* vs. *restart*). This finding also indicated that lexical learning and development were fundamentally interrelated with morphological and grammatical knowledge. This finding is not consistent with the results of a recent study by David et al. (2009), who did not detect a relationship between lexical development and morphosyntactic measures (e.g., grammatical gender) in French L2 learners and implied that

lexical development and morphological knowledge development are separate. The present study in fact provided further evidence to Nation's (2001) well-known summary of what is involved in knowing a word, clearly signaling grammatical aspects of a word as a distinct, yet inseparable, part of vocabulary knowledge.

The concurrent increase in variety of morphological forms of words and in number of word families produced further provided a hint of the relationship between vocabulary size and morphological knowledge. Indeed, there appears to be a link between morphological knowledge and vocabulary size (Mochizuki & Aizawa, 2000; Schmitt, 1997). Although a causal relationship between the two is hard to establish, it is assumed that a sizable vocabulary (a minimum of 3K+ vocabulary according to the data from Mochizuki & Aizawa, 2000) might be needed for the learners to be able to handle the complex word structures involved. As the learners in the present study were considered to be beginners in vocabulary knowledge, this might explain why they did not produce lots of varied forms of a word by absolute number (1.15 vs. 1.21 types per family at T1 and T2, respectively). Previous research found that even advanced L2 learners may only have a weak awareness and mastery of derivational suffixes and inflectional suffixes after one year of classroom exposure (Schmitt & Meara, 1997). Therefore, the learning of inflectional and derivational affixes could still be considered as a long and challenging process for beginning ESL learners. Nonetheless, the concurrent development of vocabulary size and morphological knowledge in the present study implied a relationship between the two, which confirmed the statement made by Milton (2009) that the number of words known and the knowledge of these words form a relatively unified dimension of knowledge (p. 116).

Regarding collocational knowledge, the present study found a substantial decrease in the number of 2-word verb/noun lexical bundles in learners' written production over time. More importantly, further analysis clarified that the number of distinct types of these lexical

bundles produced did not decrease in number (23 vs. 22, see Table 8). This could imply that while learners became more proficient in the language, they became less reliant on the known lexical bundles (Groom, 2009) and used the same lexical bundles less repeatedly. Evidence for this claim was also found by De Cock et al. (1998, 2004) who suggested that as the productive vocabulary size grows, the tendency to use the same lexical bundles repeatedly is likely to decrease over time.

From a qualitative perspective, the lexical bundles obtained at T2 appeared to show a bit more sophisticated knowledge of the L2 than those obtained at T1. For example, lexical bundles *the principal* and *the supervisor* appeared at T2 were covered by K3 frequency level, while all bundles at T1 were covered by K1 and K2 frequency levels. Another difference is the use of *her + noun* phrases at T1 only, not at T2. These differences might be the result of task effects as well. For example, the use of *his/her + noun* bundles might be more important for the picture-based narrative at T1 than at T2. However, because the types of 2-word verb/noun lexical bundles detected in the corpora are limited in scope and number, it is very difficult to draw any representative conclusions from these qualitative analyses on how learners' collocational knowledge developed.

Therefore, to obtain a more complete answer to the question of how learners' collocational knowledge develops over time, future research needs to make use of other measures. For example, by carrying out "node and collocates" analysis, Groom (2009) selected 10 most frequent prepositions in his corpus as "node" words to specifically focus on, and he found a positive correlation between length of L2 immersion and prepositional collocations' accuracy. Contrarily, a more recent study by Laufer and Waldman (2011), who extracted verb-noun combinations with 220 selected most frequent nouns in their corpora, showed that intermediate and advanced learners used significantly more erroneous verb-noun collocations (e.g. *get the aim, inflict argument* and so on) than beginning learners, possibly

due to increased self-confidence L2 use. Nonetheless, tentatively, it is possible to conclude that in the present study, the learners developed in terms of their written collocational knowledge because their reliance on the known lexical bundles and their tendency to use the same lexical bundles repeatedly tended to decreased over time.

*Spoken Vocabulary Development*

Now turning toward spoken vocabulary development, the results first indicated that the learners did not manage to use more word families in their spoken production over time. This was quite surprising, as intuitively the learners were expected to use more words with increased amounts of exposure. Although all based on written modality, previous research has provided ample evidence to support this prediction (Palmberg, 1987; Nadarajan 2009; Schmitt & Meara, 1998; Waring, 1997).

One reason why the learners in this study did not show an increase in the size of words families used could be related to the repetitive nature of spoken discourse. In face-to-face interaction, repetitions could occur relatively frequently not only within the turn of one speaker but also across speakers too (McCarthy & Carter, 1997). The repetitions in discourse may occur for a variety of reasons, including speakers' limited proficiency level and the topic of a conversation. Taking into consideration the basic proficiency level of the learners and the communicative negotiation-based nature of the speaking tasks used in the present study, it was possible that the learners repetitively used a specific group of words in order to reach their goals, which resulted in a negligible change in vocabulary size and no change in variety of word families used. Taking Extract 1 from the corpus at T2 as an example, one learner was negotiating with his/her partner on having a pet. Note how speaker 2 repeated the word "month" due to a limited speaking fluency and how the word "dog" was repeated cross speakers due to the topic of the conversation.

Extract 1

| | |
|---|---|
| <Speaker 1> | Mom can I have a **dog**? |
| <Speaker 2> | No it's so difficult. |
| <Speaker 1> | Why? |
| <Speaker 2> | Because all the, because I, I run the **dog** and you just said "I want a, I want a **dog**". Cause I will walk for you and I will play with him all the day. After one **month**, after one **month**, **month** I know it's finish. |
| <Speaker 1> | Finished with what? |
| <Speaker 2> | You just said you just said this for one **month** and after you, have a **dog** and, and it's finish for you. |

The other reason why the learners did not produce a greater number of word families might be because "they did not really have to". It was suggested that a comparably small amount of vocabulary is needed for speaking than for writing (Nation, 2001, p.125). Around 120 words might be enough to compose a "survival" vocabulary list for L2 language learners to meet kinds of communication needs, such as requesting food, accommodation, help and directions, buying goods and even bargaining if necessary (Crabbe & Nation, 1991). Based on this claim, it was possible that there was no need for the learners to take risks and use more varied vocabulary in their conversation because they were satisfied with the ability to get meaning across and could successfully reach their goals and complete the tasks only with the words they already knew well (102 word families at T1 and 105 word families at T2). Tentatively, then, it seems that the learners did not develop in spoken vocabulary size based on the number of word families detected in the corpora. However, to avoid the effects caused by conversational task, and gain a more complete picture of how spoken vocabulary size develops, it is important that future research include other oral tasks, such as single person narratives, which might call on richer lexical resources to construct.

Although the results did not show an increase in learners' vocabulary size in use, they in fact demonstrated a substantial increase in the proportion of advanced words (K3+ level) in use and a slight decrease in the proportion of 2K most frequent words over time. This result confirmed the findings of Bulte et al. (2009) who found a significant progress among advanced French L2 learners.

Regarding lexical depth, the findings indicated that the learners did not show an increased ability in using more diversified morphological forms, and no development concerning collocational knowledge. These results indicated that producing inflectional and derivational morphemes and collocations in spontaneous speech could be somewhat challenging for beginning ESL learners. With regard to morphological knowledge, it is not surprising that the learners did not develop in using more diversified morphological forms of a word when their vocabulary size remained relatively small over time. As proposed in the previous section, a sizable vocabulary might be needed for learners to be able to handle complex word structures (Mochizuki & Aizawa, 2000; Schmitt & Meara, 1997). As a matter of fact, research in acquisition of L1 inflectional and derivational affixes suggested that even for native speakers, who normally have a larger vocabulary size than non-native speakers, knowledge and use of affixes appears quite late in language development (Tyler & Nagy, 1989). Indeed, the process of learning may continue until high school (Nagy et al., 1993). If the learning of inflectional and derivational affixes is considered to be a challenging process even for native speakers and for advanced L2 learners (Schmitt & Meara, 1997), then it is quite understandable that it was problematic for the beginning learners in the present study.

Another reason why the learners did not developed significantly in using more diversified grammatical forms in speaking might be due to the communicative nature of spontaneous speech. The use of some incorrect grammatical forms (e.g*., it's excite* vs. *it's exciting)* may sound unnatural, while some other ungrammatical forms (e.g., *two cat* vs. *two cats; I receive* vs. *I received*) might not even be noticed during conversation. Nonetheless, these and other similar "mistakes" do not impair communication altogether. Therefore, when under time pressure to finish a negotiation task, the learners might focus more on how to get the meaning across rather than on morphological forms of the word used.

Turning to collocational knowledge, the results showed that there was no decrease in

the number of 2-word lexical bundles used by the learners over time. Instead, although not significant, there was a slight increase in the number of lexical bundles, accompanied by a growth in the types of the bundles used (20 types at T1 vs. 28 types at T2). It is worth noting that only three lexical bundles (*the food, have a, and you have*) were repeated over time (see Table 8), which means that at T2, the learners showed an increase ability in using more different types of lexical bundles. The slight increase in the tokens of lexical bundles nonetheless suggested that learners were highly dependent on these specific groups of phrases and heavily repeated them in their speech at T2. Again, the increased number of lexical bundles used might be the effect of the role-play task used at T2. Certain phrases were heavily used and repeated by the learners to meet the needs for negotiation of meanings as part of that task. As Extract 2 demonstrates, one of the most frequently used phrases at T2, "a mouse", was repeated as many as five times within a short segment of this conversation. As shown in Table 8, the frequently used lexical bundles such as *a mouse, a dog, a cat, a fish* might all be specific to the task used. Therefore, in future research a wider variety of tasks need to be used in order to separate language development from individual task effects.

Extract 2

| &lt;Speaker 1&gt; | No, mom, you know cat I'm allergic. |
|---|---|
| &lt;Speaker 2&gt; | Do you like *a **mouse*** or something like this? |
| &lt;Speaker 1&gt; | Yes, *a **mouse*** is good. |
| &lt;Speaker 2&gt; | Okay *a **mouse*** and, do you want to buy the food? |
| &lt;Speaker 1&gt; | Yes, for, for, If you, if you want, if you buy the, the food . |
| &lt;Speaker 2&gt; | It will be so. You, you buy the animal and I buy the food because *a **mouse*** is the of *a **mouse*** is not, it's not too big. |

Taking a qualitative perspective, the lexical bundles obtained at T2 seemed to reveal more sophisticated knowledge of the L2 than those obtained at T1. For example, all bundles found at T1 were covered by the K1 frequency level, while at T2, bundles such as *the mouse, the pet, the rabbit, the cage and the snake* were covered by the K3+ frequency level.

However, again, as the types of lexical bundles detected in the corpora are limited in number, no representative conclusion could be made on how the learners' production of collocations changed over time.

*Summary of the Discussion of Overall Vocabulary Development*

For written vocabulary development, the findings revealed by the statistical tests were as follows: a) learners showed an increase in their vocabulary size, as measured by the use of more word families in production over time; b) learners developed in lexical richness, as measured by the greater proportions of 3K+ level words used over time; and c) learners demonstrated improvements in lexical depth, as measured by an increased ability to use different forms of a word to meet grammatical needs and a decreased dependency on a small set of known lexical bundles. However, regardless of the significant growth over time, the low value of family-type ratio reported over time suggests that inflectional and derivational morphemes were not yet being used productively by the beginning ESL learners in the study.

With regard to spoken vocabulary development, the findings were the following: a) learners did not demonstrate growth in vocabulary size, as statistically they did not use more word families over time; b) their lexical richness increased in that the proportions of 3K+ level words increased over time; and c) their lexical depth knowledge did not show any significant development, in that they did not generate more derivational or inflectional forms of a word or expand their collocational repertoire and tended to use a small group of lexical bundles repeatedly. The latter suggests a reliance on limited language resources to communicate orally and points to possible task effects, with the paired negotiation-based tasks used in this study increasing the learner tendency to reuse the same vocabulary.

Research Question 2

What differences or similarities can be observed between oral and written productive

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vocabulary development?

Overall, it appeared that beginning ESL learners in the present study performed better and developed faster in writing than in speaking over time. Regarding vocabulary size, learners consistently produced more word families at all three frequency levels (i.e., K1, K2 and K3+) in writing than in speaking, suggesting that they tended to use more productive vocabulary when writing. This finding departs from the results of previous research on receptive vocabulary knowledge by Milton and Hopkins (2006). Milton and Hopkins reported that although learners at all proficiency levels tended to recognize more words orthographically than phonologically, for beginning learners at early stages of learning, phonological knowledge tended to grow faster than orthographic knowledge, at least with regard to frequent vocabulary (1K and 2K). This might be due to frequency effects, in that frequent words are more accessible and proportionately more frequent in speech than in writing. One reason why the beginning learners in the present study did not produce more frequent word families in speaking than in writing might be due to the repetitive nature of negotiated speech, elicited by the speaking tasks used here.

As for lexical richness, the proportions of advanced words increased in both writing and in speaking over time. However, if we take vocabulary size into consideration, it seems that the learners achieved a more stable progress in writing than in speaking. This is because the increase in the proportion of K3+ words in writing occurred in tandem with a significant increase in the size of word families, which means that the learners tended to use more diversified advanced words over time. Contrarily, the increase of K3+ words in speaking at T2 may only be the result of a greater repetition of a small group of advanced words.

Concerning lexical depth, learners developed faster in writing than in speaking as well, both in terms of morphological and collocational knowledge. One way to interpret these results is to consider the accessibility of written and spoken vocabulary. Productive

vocabulary knowledge reflects the range of words that the learner has access to and also the speed at which these words can be accessed (Milton, 2009). Using a word in speaking might be more "difficult" than using it in writing, because a word needed in a conversation has to be immediately accessible to the speaker; otherwise, the communication may break down. The learners in this study in fact had much more time to access a word in writing than in speaking and they even had enough time to go back and correct or change a word in writing if necessary. One conclusion that can be drawn here is that the beginning learners in the present study might not have been able to successfully access all the words and all the correct forms of the words they needed in conversation, which caused repetitive and often ungrammatical speech. This may explain the lack of development in learners' spoken vocabulary size, morphological knowledge, and collocational knowledge.

Another possible way of looking at these findings is to consider the existing differences between written and spoken vocabulary. Previous word frequency studies showed that "a much smaller vocabulary is needed for speaking than for writing" (Nation, 2001, p. 125). This may also explain why learners used fewer word families in speaking than in writing. Moreover, research on native speakers found that people are more reliant on most frequent and basic words in speech than in writing (Milton, 2009; Nation, 2001). The fact that learners used more proportions of K1 words in speaking than in writing, regardless of testing time, provided further evidence to this claim. As discussed in the previous section, the reason why the learners did not used more diversified words and more morphological forms of a word in speaking over time might be because, after all, they did not have to use them to accomplish their communicative goals.

*Summary of the Discussion of Comparison between Written and Spoken Vocabulary*

*Development*

The main finding regarding the comparison between written and spoken vocabulary

was a relatively faster development in writing, concerning all three aspects of vocabulary knowledge (i.e. vocabulary size, lexical richness and lexical depth). Possible sources of these differences might be task effects, differences in language access in spoken and written modalities, and differences in vocabulary size needed for spoken and written production.

## Summary of Discussion

Learners' written vocabulary developed in all dimensions including vocabulary size, lexical richness and lexical depth. With regard to spoken vocabulary, learners did not demonstrate significant growth in vocabulary size and lexical depth. Their lexical richness increased, in that statistically the proportions of 3K+ level words increased over time, which might be a consequence of the repetitive nature of the paired oral task. Taking the two modalities into comparison, learners performed better in writing than in speaking, which could be the result of a) effects of paired oral tasks, b) differences between spoken and written language access, and c) differences in vocabulary size needed for spoken and written production.

CHAPTER 6: CONCLUSION

This final chapter outlines the contribution of this research to the literature on L2 productive vocabulary development and its implications for second language pedagogy, lists several limitations of this research, and makes suggestions for the future research.

Contributions

The goals of this study were a) to investigate how different aspects of productive vocabulary knowledge develop concurrently over time, and b) to take both written and oral modalities into consideration and compare lexical development between the two.

One of the main contributions of the study is that it enriched the existing literature on longitudinal productive vocabulary development taking multiple dimensions of word knowledge into consideration (Schmitt & Meara, 1997; Bulte et al., 2008). The results of the present study provided a comprehensive picture of how different types of vocabulary knowledge develop, and offered further evidence concerning the assumption that different aspects of word knowledge are interrelated and develop concurrently.

The other main contribution of this study is the comparison made between written vocabulary and oral vocabulary development. The available L1 corpus research has suggested that language speakers use vocabulary in writing in more diversified and complex ways than in speaking (Halliday, 1989; Johansson, 2007; Nation, 2001). However, in the L2 vocabulary literature, such comparisons between writing and speaking are rare. In fact, the present study might be the first that compares L2 written and spoken production by the same group of learners from a longitudinal perspective. The results reported here suggest that in early stages of classroom-based L2 learning, learners have a tendency to develop faster and perform better in writing than in speaking. However, it needs to be highlighted that, these difference between written and spoken vocabulary development might be the result of topic or genre

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differences rather than of modality differences, as pointed out in L1 research (Nation, 2001).

Pedagogical Implications

Nation (2006) argues that L2 learners need to know at least 6,000 frequent word families to understand authentic spoken and written input in natural settings. It has been pointed out that acquiring vocabulary incidentally through exposure to the target language in communicative language classrooms only may not be the most efficient way for L2 learners to learn new words (Horst, 2010). The knowledge of the first 2,000 most frequent word families is essential for learners to carry out basic activities in the language (Nation, 2001). However, it is likely impossible to meet all the frequent words learners need to know from pure classroom exposure due to the way words distributed in natural language (Horst, 2010).

In the present study, two aspects of vocabulary knowledge, namely morphological knowledge and collocational knowledge, seemed to develop rather slowly, especially in spoken modality. Therefore, explicit vocabulary teaching could be a good supplement or even a necessary ingredient of language experience in a communicative language classroom.. Explicit teaching can create learning contexts for those frequent words that are not repeated enough in classrooms, and it can also draw learners' attention to certain lexical features, such as grammatical morphemes (Ellis et al., 2006) and collocations (Ellis et al., 2001). For example, in the study carried out by Ellis et al. (2006), these researchers found a clear beneficial effect of explicit metalinguistic explanation on learners' acquisition of the past tense –*ed*, which is considered a challenging feature to acquire for English L2 learners.

Furthermore, in addition to raising learners' awareness of the importance and difficulty of certain words and their features through explicit instruction, teachers may also need to use communicative tasks to make key words and their grammatical properties more salient, and to encourage students to use the words in production. The goal of language learning in communicative classrooms is to use language in communication. One way to improve

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productive vocabulary knowledge is to teach vocabulary productively, and "learners who practice and use their vocabulary productively will tend to grow large productive lexicons" (Milton, 2009, p. 147). Teachers may help or even "push" their students to exploit all their resources in language production; otherwise, learners may tend to stay in a "safe zone" and never take risks to use "new" and "difficult" words and phrases (Swain & Lapkin, 1995). By doing communicative tasks that elicit new vocabulary, new inflectional and derivational morphemes or new phrases being taught, learners might be more willing to incorporate these new features into their production and, as a result, to become more knowledgeable and skilled in their L2 vocabulary, and gradually establish accuracy and fluency in their production.

## Limitations and Future Research

### *Limitations*

The present study has several limitations. One set of limitations concerns the measure of vocabulary size. Corpus-based methods alone cannot give a comprehensive picture of total vocabulary size, in that a corpus of language used by a person or a group of people may represent only a part of active vocabulary. Ideally, a set of more concrete tests of productive vocabulary should be applied to measure learners' size in vocabulary. However, tests of productive vocabulary size used so far (e.g. Productive Levels Test, Laufer & Nation, 1999) tend to target written modality only, leaving the question of how to operationalize size in spoken vocabulary still unanswered. By using the corpus of learners' language production from communicative tasks, the present research showed how learners behave and perform in realistic communication. To address the issues mentioned above, future research should include multiple tasks to elicit language production, such as paired, dialogic tasks as well as single person interviews, which might require richer lexical resources and therefore provide more opportunities for learners to use the words they know. Such research has the potential to

reveal a clearer picture of how learners' L2 productive vocabulary size grows over time.

A second limitation of the present study is related to the different types of tasks used to elicit written and spoken production. Learners engaged in a paired role play negotiation task might produce lots of repeated words and phrases, whereas they would be less likely to produce language repetitively in single-person picture prompted narrative tasks. This, in turn, might impair the comparability of the results obtained in comparisons of written and spoken corpora, at least with regard to vocabulary size and collocational knowledge. It would have been advisable to use similar tasks to elicit production in writing and in speaking, which would make it easier to interpret and compare the results across modalities. For example, future research could use picture-prompted narrative tasks to elicit both oral and written production (see, e.g., Bardovi-Harlig, 1998).

Another limitation of the present study concerns the validity of the lexical bundle approach as a measure of collocation development. As discussed in Chapter Five, because the learners in the present study were relatively homogenous in their proficiency level, the 93 lexical bundle types that were above the cut-off point and were extracted from the corpus were too limited to give a full picture of how the learners were using collocations over time. Some undetected bundle types, such as deviant collocations (e.g., *make help*, *do a decision*, etc.), did not occur frequently enough to be extracted. However, those bundle types may be very informative and valuable for researchers to investigate the patterns of collocational development. One possible alternative form of analysis for future research targeting beginning L2 learners is the "node and collocates" analysis (Groom, 2009), which does not require collocations to recur very frequently in precisely the same structural sequences in order to be detected. By choosing a specific group of node words to focus on and by carefully investigating the collocations containing those words, researchers might get a more detailed picture of the qualities of those collocations produced by learners over time.

*Future Research*

Possible follow-up studies investigating the development of L2 productive vocabulary knowledge should not only examine learners' production through corpus analyses but should also investigate vocabulary access speed. As discussed in the previous chapter, productive vocabulary knowledge reflects the range of words that the learner has access to and also the speed at which these words can be accessed (Milton, 2009). This claim points to another dimension of productive vocabulary knowledge – lexical access speed – which links vocabulary knowledge to productive performance. That is, vocabulary learning is not for the sake of itself, it is done to help learner listen, speak, read or write more effectively (Nation, 01). By investigating vocabulary knowledge development, especially by using measures of vocabulary access along with diverse measures of vocabulary knowledge, researchers can get a clearer understanding of how learners develop fluency and automaticity in their L2. Available studies on lexical access speed suggest that as lexical access improves, learners tend to be less dependent on fillers and have fewer hesitations in speech (Freed, 2004; Segalowitz et al., 2004). Needless to say, more studies are needed to determine the precise link between vocabulary development and fluency, so that we can fully understand how productive vocabulary knowledge development is related to learners' performance in real language production.

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