Beneficial Repetition: A Study of Syntactic Priming in ESL Learners

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ABSTRACT

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The overall goal of this study was to examine syntactic priming in second language learners of English. Syntactic priming is a phenomenon whereby people demonstrate a tendency to use syntactic structures that are somehow related (or are in fact identical) to those they have previously heard or read. In this sense, priming can be understood as being the effect of repetition. Previous research has shown that native speakers of English (and of many other languages) demonstrate syntactic priming of this kind in their language production.

To this end, 78 CEGEP students and 60 University students completed a written sentence completion task, which contained prime and target fragments. The target syntactical structure used was dative alternation, and participants could complete the sentence fragments with a prepositional object, a double object, or any "Other" completion. Participants also completed a grammar proficiency test, which included both general and "dative alternation" items.

A significant effect for syntactic priming was found in participants from the University group who obtained high scores in the "dative alternation" section of the grammar proficiency test. The findings from this research have implications for the use of repetition in L2 classroom teaching.

ACKNOWLEDGEMENTS

DEDICATION

This thesis is dedicated to my husband Michel, my children Megan and Oscar, my sister Joanne and my mother Ruth. Without their unwavering support and boundless encouragement, none of this would have come to pass.

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CHAPTER 1

INTRODUCTION

Sydney Crosby, Andre Agassi, Tiger Williams, and Zinedine Zidane all bear witness to the power of repetition. Although these elite athletes come from distinct and very different sports backgrounds, they all have one thing in common: they have internalized the power of repetition. Many athletes who repeat movements over and over gain muscle memory (Lee, Swanson, & Hall, 1991). Because athletes' muscles remember movements, the athletes are able to tap into other resources required for high-level performance. In this fashion, repetition contributes to overall performance in sports, but is by no means the only aspect of life where repetition is evident.

Repetition also occurs in everyday language use. Various researchers have observed the use of repetition by analyzing speech corpora or transcripts of common, everyday conversations. For example, Levelt and Kelter (1982) conducted research in Holland during which they asked questions in Dutch over the telephone. They called shopkeepers to inquire about opening hours. They observed that there was a strong correlation between the structures contained in the questions and answers. When the question was "At what time does your shop close?" the answer was usually structured as "At 5 o'clock." The question "What time does your shop close?" was more likely to get the response "5 o'clock." Weiner and Labov (1983) analyzed over 1,400 utterances which occurred during interviews with a researcher in terms of use of passive versus active. They observed the same effect as Levelt and Kelter. Namely, speakers showed a

distinct tendency to repeat previously heard forms in subsequent utterances. Overall, what both research teams were able to observe is that interlocutors align their speech so that the structural aspects of their utterances, that is, the syntax of such utterances (Garrod & Anderson, 1987), take on an observable similarity. This phenomenon has been referred to as coordination in dialogue or as syntactic coordination (Bock, 1986).

Repetition in Language Teaching

Repetition also occurs in language teaching. Repetition has however fallen in and out of favour with pedagogy over the years as some language teaching methodologies were rejected in favour of others. Simply stated, the term methodology refers to the body of knowledge about how language is taught and why it is taught that way. Some subjects lend themselves better to repetition than others, but it appears that second language (L2) learning and repetition parted ways with the arrival of the communicative approach (an approach that advocates the use of language in meaningful interaction). This section introduces a brief historical overview of the uses of repetition in L2 teaching.

In terms of L2 teaching methodologies, one of the first methods that made extensive use of repetition was the classical method based on the learning of Latin and Greek. Remember learning multiplication tables in mathematics, or reciting Latinate-based verb paradigms in French class? In a "classical" language classroom, learners, for example, would be asked to conjugate the verb 'andar' in Spanish and they would do it first individually and then in groups. A direct transfer of the Latin-based learning template onto general language learning made great sense. This is likely because language learning per se was not considered as a specific, separate pedagogical

discipline. Hence, language teachers would apply what was in use for the various other scholastic disciplines (see Howatt, 2004, for a more detailed overview of the traditional language teaching methods).

Methods that made extensive use of repetition and drilling found an audience for the period that spanned the nineteenth century until the arrival of our present-day language teaching model (Weihua, 2004). The grammar translation (GT) method is one such method that was popular in Europe, for example. The GT method included a substantial amount of translation on the part of the students, as the name of the method suggests. The GT method also included much repetition in the form of writing verbs in the classical paradigm form. For example, students would conjugate the French verb 'faire' using 'je', 'tu', 'il', 'elle', 'nous', 'vous', 'ils' and 'elles' in the imperfect tense, at various times and always more than once.

The use of repetition waned slightly when the Direct Method became popular toward the late nineteenth century. The Direct Method, associated commercially with Maximilian Berlitz, refers to an approach to teaching that aims to develop students' speaking and listening skills in the target language by creating a direct association between, for example, the ink-filled instrument we use to write and the word 'pen'. Some repetition was involved and usually took the form of vocabulary drills (see Omaggio Hadley, 1993, for an overview of this method).

When repetition returned to the language teaching forefront in North American language classrooms, it manifested itself in the form of the audiolingual method (ALM). The ALM made use of what has been termed meaningless drilling (H.D. Brown, 2001), which could take the form of over half a dozen types (see Brooks, 1964, for a description

of ALM drills). In a question formation situation, for example, drilling took the following form: '*What do you*' followed by endings such as 'eat for breakfast', 'want to eat', 'want to do', 'have to do' etc. (Brooks, 1964).

Repetition, in fact, became the benchmark by which successful language learning was measured. This aspect of language learning was fully congruent with behaviourism, the scientific paradigm of the time (as defined by Kuhn, 1962). Behaviourism, as explicated by Skinner in his book *Verbal Behavior* (1957), was the governing principle for language of most things human. Robert Lado's *Language Teaching: A Scientific Approach* (1964) addressed L2 learning in a similar vein. One of Moulton's (1966) five slogans about ALM read, "Language is a set of habits", in keeping with the behaviouristic stimulus-response model of the day.

In the late 1960s, however, behaviourism lost ground to the communicative approach (Byram, 2004) and repetition was no longer fashionable. In a review of the effects of repetition, Ellis (2002) attributes the demise of repetition in the form of intensive drilling to a variety of factors, including Chomsky and a parting of ways with behaviourism as the dominant psychological paradigm of the time.

In language classrooms today, language teachers favour the communicative approach (see Howatt, 2004, and Savignon, 2004). In Quebec, this teaching methodology has become an integral part of the Quebec Education Program (see MEQ, 1999, for more information). As opposed to the more 'traditional' methods described above, the communicative approach, at least in most of its many instantiations, makes very sparing use of drilling (H.D. Brown, 2001). Harmer (1982) posits that drills focus on forms in language as opposed to content, and as such cannot be considered very communicative. It

is not surprising therefore that repetition, which underlies any form of drilling, was banned from mainstream communicative language classrooms. Nonetheless, there are many unanswered questions about the relationship between repetition and language teaching (and learning). One of these questions is this: What are some possible benefits of repetition in a language classroom? We turn to this issue next.

Repetition in Language Research

The effects of repetition in language learning have been studied in various manners and for various reasons since the 1980s. One group of studies on repetition falls under research into *input enhancement*. Input enhancement is concerned, among other things, with the possible impact of modified classroom material on L2 learners' comprehension (see Gass, 1997, for a more detailed discussion of input). For example, Jensen and Vinther (2003) sought to measure the effects of input enhancement, in the form of repetition, on Spanish L2 learners' comprehension and grammatical accuracy. Participants in this study watched a series of Spanish video excerpts three times, each played in a different combination of speech rates (e.g., fast-slow-fast etc.). Results showed that a repeated exposure to these videos in all three speech-rate combinations resulted in significant gains in participants' comprehension and grammatical accuracy.

Repetition has also been found to have an effect on output, or what L2 learners produce. In a study involving Spanish L2 learners, Gass, Mackey, Alvarez-Torres and Fernandez-Garcia (1999) used task repetition to posit that it helped learners 'free up' some of their cognitive resources so that greater contact with L2 was possible. The study investigated whether learners would show greater target-like grammatical behaviour after

having been exposed to identical video excerpts more than once. The researchers posited that the participants would be better able to attend to the form of their story re-telling after repeated viewings of the same video. Gass et al. indeed found an increase in number of target-like grammatical utterances for participants who watched identical videos.

Studies into the effects of repetition in its various forms have also taken place in more experimental contexts. Such studies have largely employed priming as a methodology to measure possible benefits of repeating a word, sentence, or syntactic structure (see Pickering & Branigan, 1999, and Ellis, 2002, for reviews). Priming is a phenomenon whereby people demonstrate a tendency to use words, sounds or structures that are somehow related (or are in fact identical) to those they have previously heard or read. An example of lexical priming can be found in the expression "Thanks very much!" that usually primes an interlocutor speaking the same language as the speaker to respond with "You're welcome". An example of phonological (auditory) priming is demonstrated in Trofimovich and Gatbonton (2006), where participants repeated words significantly more rapidly when they had heard them beforehand, even if unrelated words intervened. Finally, an example of syntactic or structural priming can be illustrated when a picture is described using a double object dative structure (e.g., *The man is reading his son a story*) after the person describing the picture heard or read an utterance where the double object dative was used (e.g., *The girl is giving her teacher an apple*). In this sense, priming can be understood as being the effect of repetition.

Priming informs researchers about a variety of issues, due to its unique characteristics which we will touch upon briefly here (see Chapter 2 for a detailed discussion of the characteristics of priming). Firstly, priming informs researchers about

implicit learning (typically, learning that takes place without intention or awareness). Secondly, priming gives researchers insight into how cognitive processing occurs. Lastly, priming is used by researchers as a methodological tool to understand how a language user's knowledge of a language is organized. In the course of their experiments, researchers use a variety of tasks to observe a priming effect (see Pickering & Branigan, 1999). It is this priming effect that researchers measure in their experiments to determine effects of repetition in language learning and use (e.g., Bock & Griffin, 2000; Savage, Lieven, Theakston, & Tomasello, 2006). It appears, then, that insights gained in priming research might not only suggest how speakers process language in the context of a psycholinguistic laboratory but also inform how speakers learn language in a classroom, advancing our knowledge of language teaching and learning.

Bridging the Gap between Language Teaching and Research

One of the most important roles of language teachers is to facilitate their students' development in the subject at hand. In L2 learning, teachers are especially interested in assisting the language learner along the challenging path that ultimately leads to a relative mastery of a language that is not their native tongue. If teachers made use of language research on a regular basis to inform their teaching practices, the all-around result would likely be very satisfactory. Researchers would have a 'raison d'être' for their research, teachers would have an even greater incentive to teach, and students would have additional impetus for learning.

Priming research can be especially helpful in this respect, given the unique characteristics of priming. More specifically, the link between priming and implicit

learning is both interesting and practical (more details about the implicit nature of priming can be found in Chapter 2). The body of priming research, particularly research on syntactic priming, has also established that this phenomenon is also developmentally constant, found in children, adults, monolinguals, bilinguals, and L2 learners (see reviews in Branigan, 2007, and Pickering & Branigan, 1999). As an implicit and nearly "universal" repetition-driven phenomenon, priming could thus be helpful in informing L2 teachers about how learners process input, how learners learn implicitly, why teachers might wish to teach learners implicitly, and how teachers can bring back the beneficial aspects of repetition to language learning classrooms. The present study is set within this larger research context.

Motivations for the Current Study

Priming is interesting from many points of view, including phonological, lexical, semantic, and syntactic. Various aspects of language illustrate the priming effect. Interaction is peppered with examples of lexical priming (see Hoey, 2005, for a theory of lexical priming). Instruction in pronunciation could become more efficient if it relied on phonological (auditory) priming, as was posited in Trofimovich and Gatbonton (2006). Discourse analysis makes use of lexical-semantic priming whereby the ubiquitous "May I take your order?" at a fast food restaurant will usually prime the customer for an utterance that begins with "Yes, I'll have..." The focus of the present study is however on syntactic priming. In order to use syntactic priming as a tool to inform and guide teachers, it is important to investigate this phenomenon in greater detail.

The present study has two goals. The first goal is to examine syntactic priming (i.e., the effect of repetition on the use of syntactic structures) in L2 learners of different proficiency levels. The aim here is to determine if L2 learners of different proficiency levels can partake of beneficial effects of repetition in their syntactic processing. The second goal is to examine the nature of L2 learners' linguistic system, as revealed through patterns of syntactic priming. The idea here is to use syntactic priming as a phenomenon in order to gain insight into the nature of linguistic processing in L2 learners of different proficiency levels. These two uses of priming methodology—to study priming as an implicit learning phenomenon and to use priming to reveal how L2 learners organize their linguistic (syntactic) system—are reviewed in detail in Chapter 2. The overarching objective of the present study is to investigate syntactic priming in L2 learners in order to inform L2 teaching methodology, helping L2 teachers in assisting their learners along the L2 developmental path.

CHAPTER 2

LITERATURE REVIEW

Chapter Overview

The goal of this chapter is to explore literature related to syntactic priming. In the

first section, syntactic priming is defined. The second section describes the various

syntactic priming experiments and the methodologies used in syntactic priming research.

In the third section, the unique properties of syntactic priming are discussed. The fourth

section examines how priming is indicative of implicit learning and how it provides

evidence of language organization in language users. This chapter concludes with

research questions for a study of syntactic priming in L2 learners.

Definition of Syntactic Priming

Bock (1986) defined syntactic priming as the tendency for speakers "to repeat the

syntactic forms of sentences in subsequent utterances that are minimally related in

lexical, conceptual, or discourse content" (1986, p. 378). For example, if a speaker hears

an utterance, "My wallet was stolen at the ski lodge last weekend" (a passive

construction), this speaker is more likely to reuse the same construction later, in a totally

unrelated utterance, "I was met by a tour organizer at the airport in St. Petersburg". In

essence, as this example illustrates, speakers recycle previously heard or seen

grammatical forms in their own subsequent utterances. Bock's definition has become the

most accepted one in the field of priming, and is oft referred to in the literature when a

working definition is required.

Qualitative Evidence of Syntactic Priming

Although the first experimental demonstration of syntactic priming appeared in Bock's (1986) article, previous research into what is presently referred to as syntactic priming stretches as far back as 1934, when Karl Bühler's *Sprachtheorie* reported a tendency for speakers to work previously heard words, clauses, or structures into their own speech. He observed this tendency when his students formulated critical opinions about Nietzsche's aphorisms using structures previously heard from himself as he read Nietzsche's writings aloud. Bühler observed that the speakers chose to reuse previously encountered forms as a means to guide speaking, and hypothesized that their doing so alleviated mental resources to allow them to better attend to critical thinking. The participants recycled previously heard utterances into their dialogue even if the use of alternate constructions would have been entirely plausible. Bühler attributed this discovery to Kant and termed this phenomenon as being the use of "empty syntactic schema" (1934, p. 284), although he preferred to refer to the phenomenon as "patterns".

Almost half a century was to pass before syntactic patterning of this kind was re-examined. In his study of recorded conversations, Schenkein (1980) noted, among other things, the quasi-exact repetition of grammatical forms. A striking example of this repetition can be gleaned from a conversation between a group of bank robbers, who re-used sounds, words, and syntactic forms during the course of a radio conversation with a person acting as their lookout. Consider, for example, the following dyad:

Speaker A: Cor, the noise downstairs, you've got to hear it and witness it to realize how bad it is.

Speaker B: You have got to experience exactly the same position as me, mate, to

understand how I feel.

The above is an excerpt from a lengthier conversation recorded by a ham radio

operator. Speaker A is presumed to be located inside a bank vault, while his colleagues

tunnel through adjacent basements to get to the safety deposit boxes inside the vault.

Speaker B is presumed to be located on the roof of a building overlooking the bank.

Based on the wider exchange, one can infer that the two robbers are comparing

grievances. In doing so, Speaker B reuses three distinct forms previously used by Speaker

A. First, they both use the imperative mood, even if Speaker A makes use of an

abbreviated form. Second, the infinitive form reoccurs, even if Speaker A uses "hear and

witness" and Speaker B uses "experience". Finally, in another use of the infinitive,

Speaker A uses "to realize" while Speaker B uses the very similar "to experience." In this

fashion, Schenkein describes a taxonomy of repetition in conversation, including the

repetition of syntactic forms.

Two other qualitative studies carried out in the early 1980s using naturally

occurring conversations or elicited verbal data yielded interesting insights into syntactic

repetition. The first of the two was a study conducted by Weiner and Labov (1983), who

studied constraints on the use of the agentless passive. For example, to the question "Who

did this?" a possible answer was "The liquor closet got broken into" (p. 34). Weiner and

Labov posited that constraints both internal and external to the speaker come into play

during speech, influencing the speaker's choice not to use an agent with the passive

voice. To illustrate the phenomenon, the researchers used previously gathered interview

data from speakers situated in three distinct socioeconomic locations, both in

Philadelphia and New York. More specifically, they recorded speech from 23 white

working class speakers and 11 white middle class speakers from Philadelphia, and 10

black adolescent speakers from Harlem. The discussion of the various constraints as well

as of the nature of the utterances, classified as 'given' and 'new', led Weiner and Labov

to conclude that repetition of the agentless passive in speech occurred more frequently

than could be accounted for by chance. Furthermore, this phenomenon was

indistinguishable across the three socio-economic groups, suggesting that the repetition

of patterns in speech does not depend on the speaker's dialect, speech register, level of

formality, or socioeconomic status.

In the second study, Levelt and Kelter (1982) conducted a series of six

experiments to investigate what they termed "the genesis of the correspondence effect".

They define the correspondence effect as the phenomenon by which previously heard talk

creates sentence frames in the mind of the speaker. When the time comes for speech,

interlocutors reuse these frames in their own utterances. In one experiment, already

described earlier, Levelt and Kelter placed telephone calls to Dutch shop owners, under

the guise of a request for information. The researchers found that the question "What

time does your shop close?" was more likely to result in the answer "5 o'clock" and that

the same question formulated as "At what time does your shop close?" was more likely to

engender the response "At 5 o'clock". Both the Weiner and Labov and the Levelt and

Kelter studies suggested that interlocutors frequently repeat previously heard syntactic

forms.

Experimental Evidence of Syntactic Priming

Bock (1986) provided the first experimental evidence of syntactic priming. Bock's experiment took the guise of a picture description/recall task, during which the researcher read priming sentences aloud to the participants and showed them target pictures to elicit certain syntactic forms. The participants were asked to make a 'yes' or 'no' decision as to whether they had heard the sentence or seen the picture previously and were subsequently asked to describe a picture. In their picture description, which was (unbeknownst to participants) the most crucial aspect of Bock's experiment, participants could use syntactic constructions including the transitive (either active or passive voice) and the dative (either prepositional object or double object).

Bock reasoned that, in their picture descriptions, participants would reuse the syntactic structure that was recently heard. For example, the participants would hear and repeat sentences such as "A rock star sold some cocaine to an undercover agent" (prepositional object dative) or "A rock star sold an undercover agent some cocaine" (double object dative) and would subsequently be shown a picture of a man reading a book to a child. In principle, the participants could feasibly use either one of the two syntactic forms or, in fact, an entirely different structure altogether to describe the picture. However, the results showed that the participants were influenced (primed) by what they produced earlier. The participants who produced a prepositional dative earlier were more likely to describe the picture using a prepositional dative (*The man is reading a story to the boy*). By contrast, those participants who produced a double object dative earlier were more likely to describe the picture using a double object dative (*The man is reading the boy a story*).

Taken together, Bock's results showed that there was a significant increase (23%) in the participants' use of the prepositional dative after the participants had previously heard the prepositional dative. There was a comparable significant increase (22%) for the use of the double object dative construction following its use in production earlier. The results were not as strong for the use of the active or passive utterances following active or passive primes (about 8% increase in each case), although these remained significant.

Methodologies and Techniques Used in Syntactic Priming Research

The main goal of experimental research into the syntactic priming effect is to demonstrate that when speakers have alternatives in their choice of utterance structure, they will produce a previously heard or seen structure. For example, hearing a passive structure will result in the use of the passive, even if the choice of the active is as probable. The evidence supporting the existence of the syntactic priming effect has been gathered with the use of various experimental techniques. The four types of priming experiments that will be considered in this section include (a) spoken picture description, (b) sentence recall, (c) confederate scripting, and (d) sentence completion. Relative strengths and limitations of each method will be discussed, especially with respect to L2 research.

Spoken Picture Description

Sentence recognition combined with picture description was the technique used to elicit target utterances in the syntactic priming experiments conducted by Bock and her colleagues (e.g., Bock, 1986, 1989; Bock et al., 1992; Bock & Griffin, 2000). In this type of experiment, participants hear and repeat picture descriptions containing the syntactic structures being primed for. For example, the researcher reads either a passive (*The*

referee was punched by one of the fans) or an active sentence (*One of the fans punched a referee*) aloud and asks the participants to repeat it. The participants are then asked to describe a picture of lightening striking a church, which they could do using one of the two syntactic forms they had been primed for. In this fashion, as was described above, Bock and her associates have demonstrated the persistence in the use of syntactic structures in a novel sentence production task, even when there are as many as 10 intervening sentences separating the prime and the target sentences (see, e.g., Bock & Griffin, 2000).

The main strengths of this experimental technique are that it yields results that are replicable across studies and that it is sensitive enough to detect priming effects (Bock, 1986, 1989; Bock & Griffin, 2000; Bock & Loebell, 1990; Bock et al., 1992; Hartsuiker & Kolk, 1998; Hartsuiker, Kolk & Huiskamp, 1999; Loebell & Bock, 2003). The general limitation of this technique, at least at the implementation level, is that participants often produce picture descriptions using incomplete sentences or other (non-target) syntactic structures. This often results in large proportions of unanalyzable data. From an L2 research perspective, novel sentence generation may pose a problem, especially for low-proficiency participants. If the participants lack control over the syntactic feature being elicited, they may avoid using the target structure (Chaudron, 2003). Alternately, the participants may not have sufficient vocabulary resources to use the targeted syntactic form. This is especially true when the target structure does not exist in the participants' native language (L1), as is the case, for example, with the double object construction in French (White, 1987).

Written Sentence Completion

Written sentence completion, a written version of a sentence production experiment discussed above, is another technique used to study syntactic priming (Branigan, Pickering & Cleland, 1999; Hartsuiker & Westenberg, 2000; Pickering & Branigan, 1998; Pickering, Branigan & McLean, 2002; Scheepers, 2003). In their study using this technique, Pickering and Branigan (1998), for example, designed 32 sets of items, each comprised of two sentence fragments (a prime and a target) to be completed with either a prepositional object (PO) dative or a double object (DO) dative. A prime fragment would read "The racing driver gave the torn overall..." and a target fragment would read "The patient showed..." Under the guise of wanting to know more about what types of sentences people produced, the participants were given test booklets with 224 sentence fragments, and asked to complete the sentence fragments as quickly as possible. Of the 224 total sentence fragments, 64 were part of the experiment and 160 were fillers. As in spoken picture description experiments, participants would demonstrate syntactic priming if they complete target fragments more frequently with a DO dative after a DO prime, and with a PO dative after a PO prime.

The researchers found that PO target completions increased by roughly 12% and DO target completions increased by 10% after PO and DO primes, respectively. Furthermore, over 17% of the target completions were of the same type as the prime completions when the verb was the same. This percentage dropped to 4.4% when the verbs differed. Overall, Pickering and Branigan demonstrated that a written completion task yields a measurable priming effect and that this effect is detectable even when the prime and target sentences do not share the same verb.

The relative strength of this methodology is that it elicits the target form almost 100% of the time, leading to little data loss (at least for native speakers). A possible limitation of this technique lies in the nature of the writing task *per se*. Writing may draw on learners' metalinguistic knowledge (i.e., knowing about language) and may not engage the language production system to a similar extent that speaking does. Another limitation of this technique is that low proficiency learners may have great difficulty completing L2 sentences in writing.

Sentence Recall

As a variation of the abovementioned experimental techniques, Potter and Lombardi (1998) employed a sentence recall task to test for syntactic priming effects. In a sentence recall task adapted for the study of syntactic priming, participants read a sentence (target) shown to them on a computer screen one word a time. After a brief delay, they read another sentence (prime). After another brief delay, participants are asked to recall the first of the two sentences they have seen. To study syntactic priming, researchers manipulate the syntactic structures of the prime and target sentences. For example, the participant first reads a PO construction (*The waitress handed two glasses to a customer*), then a DO construction (*The old man is reading a boy a story*) and finally recalls the first sentence. If speakers tend to repeat the syntactic structures they previously heard or read, then the syntactic structure of the intervening sentence (DO construction) should influence the recall of the original sentence (PO construction). Using this methodology, Potter and Lombardi (1998) found exactly that. The participants reused the surface structures of the prime sentence in their recalled sentences, even if the use of an alternate structure was entirely plausible.

Although this task reveals effects of syntactic priming in sentence recall, suggesting that syntactic priming is a pervasive phenomenon that influences many language processes, it has not been extensively used in L1 and L2 priming research (Meijer & Fox Tree, 2003; Potter & Lombardi, 1990, 1998; Lombardi & Potter, 1992). From an L2 research vantage, sentence recall likely carries a lesser degree of difficulty than sentence generation. However, a possible limitation of this technique is that the task may prove to be difficult for participants as they typically have to meet a stringent criterion for correct sentence recall in order for their data to be included in the analyses (for Potter and Lombardi's experiment the threshold was set at 68% correct recall).

Confederate Scripting

Confederate scripting is one of the more unique methodologies used in syntactic priming research in that it is designed to study the priming effect in dialogue as opposed to in individual sentence production. Originally developed by Branigan, Pickering and Cleland (2000) for use in comprehension tasks with English speakers, this task was subsequently used with Spanish-English bilinguals (Hartsuiker, Pickering, & Veltcamp, 2004). It was also modified for use with L2 English speakers (McDonough, 2006). In this type of experiment, one of the participants is actually a research confederate. To complete the task, participants take turns describing a set of pictures using verbs written under the pictures. A visual barrier separates the two participants so that the participants do not see each other's pictures. The researchers supply the confederate with a script so that the confederate is actually describing the pictures using the syntactic form being primed for. The participant's task is to look for the card which corresponds to the confederate's description. In the comprehension priming version of this task, the

participant looks for the matching card and produces an utterance to describe the picture. In the production priming version of this task, the participant repeats the confederate's sentence while looking for a card and then produces a picture description.

Using confederate scripting to investigate syntactic priming in L2 learners, McDonough (2006), for example, tested for alternation of the dative between DO dative (*The man served the girl ice cream*) and PO dative (*A man is throwing a ball to his girl*). In McDonough's experiments, the confederate would describe a picture which included two people and a doll using a PO dative construction with the verb "to take" (e.g., *The man takes the doll to his friend*). The participant would then supply a description of a picture of two children and a glass of water using the verb "to bring" (e.g., *A girl is bringing a glass of water to her brother*). Participants would demonstrate syntactic priming if they describe pictures more frequently with the construction used previously by the confederate than with the constructions not previously used by the confederate. The results of this experiment revealed an increase in the use of PO dative after PO dative primes in both the comprehension and production versions of this task. McDonough, therefore, demonstrated that L2 English speakers can be primed, albeit more so for commonly occurring structures such as the PO dative.

The relative strength of the confederate scripting task lies in its robust link to dialogue, which is a more natural speech production task than picture description or sentence recall. The strength of confederate scripting also contains its limitation in that L2 learners may have difficulty with dialogue, especially at a beginner proficiency level.

Characteristics of Syntactic Priming

The body of research on syntactic priming has revealed some unique characteristics of this phenomenon. In this section, the most salient properties of syntactic priming will be explored. These include (a) the insensitivity of priming to lexical, phonological, or semantic changes, (b) the domain general nature of priming across both the receptive (reading and listening) and productive (speaking and writing) language skills, (c) the occurrence of priming across all ages and stages of L1 and L2 development, and (d) the long-lasting effect of syntactic priming.

Insensitivity to Lexical, Phonological, and Semantic Repetition

An interesting aspect of syntactical priming is that it is impervious to repeated lexical information. In other words, the syntactic priming effect does not depend on repeated lexical items and is detectable when no lexical overlap exists between prime and target sentences. An example of a naturalistic conversation cited earlier from Schenkein's research (1980) reveals that Speaker B reuses Speaker A's imperative and infinitive frames, inserting different lexical items within those frames. Likewise, in an experimental demonstration of syntactic priming, Pickering and Branigan (1998) showed that priming occurred in a written sentence completion task even when prime and target sentences did not share the same verb.

Similarly, priming is insensitive to repeated phonological information, for example, repeated sentence prosody. In a series of confederate scripting tasks, Cleland and Pickering (2003) demonstrated a measurable priming effect in the production of noun phrases. In one of the experiments, the priming effect remained unchanged whether the target and the head noun of the noun phrase in the prime were phonologically related or

not. For example, the participants were asked to describe a picture of a pink sheep after seeing one of these noun phrases used as primes: *the pink ship* and *the ship that's pink.* Although these primes were phonologically similar to the target (*sheep*), there was no measurable increase in the priming effect due to similar phonology between the primes and the targets. It was only the syntactic frame itself (determiner-adjective-noun or determiner-noun-relative clause) that was subject to priming effects.

Priming is also relatively insensitive to repeated semantic information. Perhaps the most salient example of the priming effect occurring across shared syntax but different semantics can be found in Bock and Loebell (1990). These researchers hypothesized that, if priming was partially dependent upon conceptual (semantic) structures, then the magnitude of the priming effect should be greater for those prime sentences that are related to target sentences in thematic roles (i.e., their semantics) than for those prime sentences that are not. In Bock and Loebell's study, the participants first saw one of several prime sentences which included, for example, "The foreigner was confused by the blinking traffic light" and "The foreigner was loitering by the blinking traffic light" (p. 18). The first of these sentences is a genuine passive, with noun phrases fulfilling the roles of patient and agent. In contrast, in the second sentence, the thematic roles of noun phrases are those of agent and location, respectively. After reading prime sentences such as these, the participants were shown a target image (which could be described using either an active or a passive sentence) and were asked to describe it. Results revealed that *both* types of primes were equally successful at encouraging the participants to produce target structures (i.e., passives, in this case) as picture descriptions. It appears, then, that syntactic priming is largely driven by the repetition of

syntactic frames, not by the repetition of the meaning expressed in them (see also

Hartsuiker & Westenberg, 2000).

Priming in Production and Comprehension

Priming is a domain general phenomenon. In other words, it occurs across both

the productive (speaking and writing) and receptive (listening and reading) language

skills. In a review of cross-modality experiments (i.e., experiments that investigate how

comprehension and production processes interact), Branigan, Pickering, Liversedge,

Stewart and Urbach (1995) cite Bock's (1986) experiment as being reflective of

production-to-production priming. Recall that in Bock's study participants first repeated a

prime sentence and then described a picture, demonstrating a syntactic priming effect in

picture descriptions. As evidence for comprehension-to-production priming, Branigan et

al., for example, cite Levelt and Kelter's (1982) study with Dutch shopkeepers. The

shopkeeper first had to comprehend the question, which varied between "What time does

your shop close?" and "At what time does you shop close?" (1982, p. 89), in order to

produce the response which either contained the preposition or did not.

Priming in Language Development

Priming is measurable across the various stages of language development. Both

children (Savage, Lieven, Theakston, & Tomasello, 2006; Garrod & Clark, 1993) and

adults can be primed (Bock, 1986, 1989; Bock & Griffin, 2000; Bock & Loebell, 1990;

Bock et al., 1992; Hartsuiker, Kolk & Huiskamp, 1999; Branigan, Pickering & Cleland,

2000), with syntactic priming effects demonstrated in several languages: English (e.g.,

Bock et al., 1992), Dutch (Hartsuiker & Kolk, 1998), and German (e.g., Loebell & Bock,

2003). The priming effect is also measurable in bilinguals: Dutch-English (Hartsuiker,

Pickering, & Veltcamp, 2004) and Spanish-English (Meijer & Fox Tree, 2003). Finally, the priming effect is obtained among L2 learners of English from many language backgrounds (McDonough, 2006). The fact that syntactic priming cuts across such a wide variety of participants, age groups, languages, and linguistic experiences makes it a unique and pervasive phenomenon.

Long-lasting Nature of Priming

A crucial factor which contributes to the uniqueness of priming lies in its long-lasting effect. Part of the early research into syntactic priming sought to demonstrate that the measurable effect could not be attributed to transient activation only, that is, to short-lived changes in syntactic production. In other words, it was important to demonstrate that working memory alone was not responsible for the syntactic priming effect. In their study of syntactic priming using a sentence recall task, Potter and Lombardi (1998), for example, found evidence against a direct contribution of verbatim short-term memory to syntactic priming. They found that participants changed the syntactic structure in recalled sentences to reflect structures previously read, instead of retrieving the original syntactic forms verbatim from short-term memory.

To demonstrate the long-lasting effect of priming in an experimental setting, other researchers (e.g., Bock & Griffin, 2000) have manipulated the number of sentences occurring between a prime and a target. These researchers used two, four, six and ten intervening sentences with syntactic forms that were unrelated to those under study. Their finding was that a measurable priming effect occurred even after ten intervening sentences, thus demonstrating its long-lasting nature. An even more striking demonstration of the persistence of syntactic priming was provided by Savage et al.

(2006). In their experiment with 4-year-olds, these researchers conducted post-tests using varied prime sentences (different verbs) one week and one month after the main experiment. In both cases, they observed measurable syntactic priming effects. This long-term nature of syntactic priming has led several researchers to suggest that syntactic priming may represent a form of implicit learning (Bock & Griffin, 2000). This issue will be examined in detail next.

Priming as Implicit Learning

Is syntactic priming a form of implicit learning? If so, then syntactic priming becomes interesting not only from a theoretical standpoint, as a psycholinguistic phenomenon, but also from a pedagogical viewpoint. For instance, an ESL teacher could elicit target structures for the passive voice from students after having syntactically primed them beforehand. These students could thus learn English structures implicitly, perhaps by using or experiencing the structure, without much explicit teaching on the part of their teacher. This section discusses how syntactic priming fits some of the criteria for implicit learning.

According to Seger (1994; see also Reber, 1993, and Frensch & Runger, 2003), implicit learning has several characteristics that must be present in the phenomenon under study for it to be considered as such. First, participants who have "learned implicitly" may not be able to consciously recall some or any of what they learned. Syntactic priming appears to fit this criterion well. For example, participants in Bock's (1986) syntactic priming experiments were interviewed after their completion of the experimental task. Specifically, they were questioned about their "awareness" of how the

pictures and sentences may have been related, how the sentences may have affected their picture description, how their picture description "register" may have differed from their usual register, and if the repeated sentences had any special characteristics. After analyzing these reports, Bock concluded that the priming effect was largely unconscious, given that the participants gave no indication of awareness for any of the abovementioned points.

Second, Seger (1994) states that "implicit learning does not involve processes of conscious hypothesis testing but is an incidental consequence of the type and amount of cognitive processing performed on the stimuli" (p. 164). What this suggests is that implicit learning is incidental in nature, not driven by conscious or explicit learning processes. In L2 research, one demonstration of the incidental nature of implicit learning comes from Williams (2005). In his research, Williams (2005) used miniature artificial noun class systems with novel determiners (*gi, ne, ro* and *ul*) to investigate whether participants attended to learning form or meaning. In this case, the form was represented by distance and the meaning was represented by animacy. Two of the novel determiners were to indicate proximity, such as "gi flies" and "ro book". To indicate distance, the other two novel determiners were used, as in "ul bears" and "ne sofa". (Note that *flies* and *bears* are animate nouns, while *book* and *sofa* are inanimate nouns.) After some task training on form (distance) only, the participants were asked to select what they believed to be the more appropriate, familiar, or better noun phrase containing the novel determiner, and (subsequently) to formulate a rule regarding determiner choice. Williams found that 80% of the participants claimed to be unaware of a rule for determiner choice, but that their scores on determiner choice were higher than those that could be attributed

purely to chance.

In light of these results, learning without awareness (implicit learning) is likely akin to learning without explicit hypothesis testing. The nature of syntactic priming is consistent with the type of learning demonstrated by Williams. Participants in syntactic priming experiments repeat previously heard or seen syntactic patterns without being aware of any rule or generalization governing their choice. As was discussed above, following the priming task, participants are unable to explain their speaking "behaviour", such as, for example, a change in their register of speech (Bock, 1986).

Yet another of Seger's criteria requires that implicit learning be impervious to brain disorders such as amnesia and aphasia. (For a comprehensive discussion of implicit learning criteria, see Seger, 1994). Hartsuiker and Kolk's (1998) research on syntactic priming is relevant to this criterion. Using a picture description task, these researchers investigated the syntactic priming effect in 12 patients suffering from Broca's aphasia. The elicited target forms included the transitive (passive and active) and the dative (DO and PO) constructions. The researchers found a measurable priming effect in the aphasic group across three of the four target structures. It appears, then, that aphasics (those who might not have a conscious recollection of having perceived or produced particular syntactic structures) are nevertheless influenced by such structures to the extent that they reuse them in subsequent comprehension and production.

Taken together, the above findings point to a possible link between syntactic priming and implicit learning. These findings also reflect the link between implicit learning and procedural knowledge (knowledge of cognitive operations or procedures acquired through their repeated use), whereby participants in syntactic priming

experiments demonstrate knowledge of complex syntactic structures, such as passives or prepositional object datives, through repetition (see Chang, Dell, Bock, & Griffin, 2000). In fact, some scholars have suggested that syntactic priming reflects the operation of the human language production system itself (Bock & Griffin, 2000), such that syntactic priming represents a gradual, implicit fine-tuning of the production system through "every episode of adult language production" (p. 189).

Research Question 1

If syntactic priming is a phenomenon that is implicit in nature, one that is reflective of the operation of the production system itself, then it is important to investigate this phenomenon in L2 learners. In other words, if a measurable syntactic priming effect is indicative of implicit learning at the level of comprehending and producing language, then it is important to demonstrate that L2 learners can partake of this kind of learning. There is limited evidence regarding this issue available to date. Using the confederate scripting technique and analyses of oral interaction, McDonough and her colleagues recently provided some preliminary evidence that at least some advanced L2 learners demonstrate syntactic priming effects for PO datives (McDonough, 2006) and in question formation in English (McDonough & Mackey, 2006). Clearly, in order to generalize these findings to other populations of learners (those of different proficiency levels and of different language backgrounds) these findings need to be replicated.

The first goal of this thesis study was therefore to replicate and extend these previous findings by using a different methodology (written sentence completion) with two groups of francophone L2 learners of English (intermediate and advanced). This

study focused on dative alternation (PO and DO datives), a structure previously used in syntactic priming research with native English speakers (e.g., Pickering & Branigan, 1998) and L2 learners (e.g., McDonough, 2006). A written sentence completion task, adapted from Pickering and Branigan (1998), was used to measure the existence of the priming effect. This task has been successfully used previously to elicit syntactic priming effects in native speakers (e.g., Pickering & Branigan, 1998). With task materials well adapted to high-intermediate and advanced levels of L2 proficiency, this task should be sensitive to syntactic priming effects in an L2. By using this task, as opposed to spoken picture description, sentence recall, or confederate scripting, it may also be possible to avoid several serious methodological limitations characteristic of these other tasks (e.g., low picture description rates, strict recall criteria, etc.).

Based on previous findings reported by McDonough and her colleagues (McDonough, 2006; McDonough & Mackey, 2006), it was predicted that L2 learners would demonstrate syntactic priming in written sentence completion for at least one of the two syntactic structures featured here—PO dative (present in the learners' L1, French) as opposed to DO dative (absent in French). If learners' sensitivity to repeated syntactic structures in the L2 develops as a function of L2 proficiency, then it is predicted that advanced learners will be more likely to show syntactic priming effects than intermediate learners.

Priming as Evidence of Language Organization

Besides being an observable psycholinguistic phenomenon and, therefore, an object of study in its own right, syntactic priming has also served as a research tool

helping researchers understand how speakers organize their knowledge of language (Fox

Tree & Meijer, 1999; Levelt, 1989; Pickering & Branigan, 1998; Roelofs, 1992a;

Roelofs, 1992b; Levelt, Roelofs & Meyer, 1999). In fact, measurable syntactic priming

effect may be revealing of a language user's "internal grammar", or the mental

representations that engender speech. This section first describes a model which

represents how nouns and verbs are produced (Roelofs, 1992; Roelofs, 1992b).

Subsequently, this model is discussed in relation to syntactic priming and how it can offer

insights as to how language, and more specifically grammar, is organized in the human

mind and how it is consequently deployed in production (Pickering & Branigan, 1998).

Speech Production as a Complex Process

Psycholinguistic theory currently explains speech production as being an

interactive, staged process, whereby speakers access the varying elements of language in

mere milliseconds. Levelt et al. (1999) posit the existence of two broad categories of

stages involved in speech production: the *lemma stratum* and the *word-form stratum*. The

former includes syntactic information and the latter involves both phonological and

morphological information. In terms of syntactic priming, the lemma stratum is

especially interesting, given that it contains *category* information, *featural* information

and *combinatorial* information about the lexical entries (words) to be encoded into a

particular syntactic structure.

If, for example, we are asked to describe the picture reproduced as Figure 1, we

first retrieve the appropriate words to be used in describing the depicted concepts and, as

a result, invariably access category information for such words (e.g., noun, verb,

adjective). For example, we may choose "man" and "give", identifying the first of these

two words as a noun and the second as a verb. We then access featural information for the retrieved verb (e.g., person, number, tense) and noun (e.g., gender, number, case). Thus, for example, in formulating our picture description, we may wish to encode the verb "give" in the third person singular, present progressive (*is giving*). We also access and use combinatorial information about these same words; this information specifies how words are combined to form larger units within an utterance. At this stage in the production process, we might sequence the selected words for our picture description as "man give [3rd person singular, progressive] woman [female, singular] money [noncount]". In a later stage of the speech production process, this sequence will subsequently be fully encoded both morphologically and phonologically and will eventually be articulated, for example, as "The man is giving the woman some money".

Figure 1. Illustration of DO construction: "The man is giving the woman some money".

Syntactic priming is thought to operate at the stage of the language production process described above: the lemma stratum. If, for example, we have previously heard a PO dative construction to describe another picture (Figure 2) depicting two boys (*The boy*

is showing a picture to his friend), we will be more likely to describe the picture in Figure

1 using the PO dative (*The man is giving some money to the woman*). In other words, our

previous experience with "assembling" a PO dative construction at the lemma stratum

will influence (prime) our subsequent language production, making it more likely that we

will assemble the same construction.
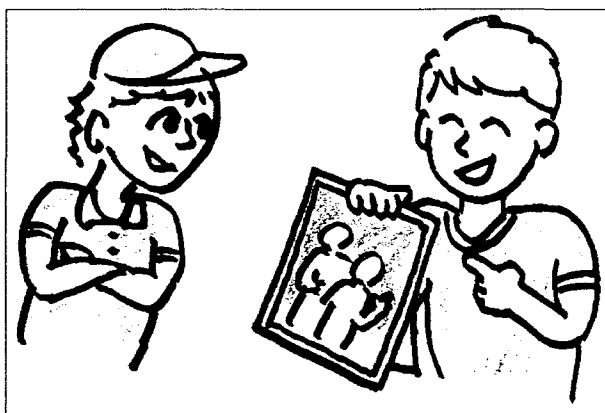
Figure 2. Illustration of PO construction: "The boy is showing a picture to his
friend".

What do Speakers "Know" about Grammar?

Pickering and Branigan (1998) conducted a series of syntactic priming

experiments (using a written sentence completion task) to specifically explore how

syntactic priming can reveal what L1 speakers of English "know" about the grammar of

their language at the lemma stratum. To do so, the researchers designed 32 sets of items,

each comprised of two types of sentence fragments: one inducing a DO dative

completion (e.g., *The hostess handed the guests...*), the other inducing a PO dative

completion (e.g., *The hostess handed the dessert...*). These sentence fragments (primes)

were followed by a (to be completed) target sentence fragment (*The newsagent*

handed...). The order of these fragments was randomized and combined with filler sentences to form a booklet of 224 fragments. The participants were instructed to complete the written sentence fragments with the first grammatical construction that came to mind. The researchers posited that participants would reuse either a DO or a PO dative construction to complete the target sentences, depending on whether the noun phrase following the verb in the prime fragments was the patient (DO) or the beneficiary (PO) of the dative construction, respectively. The results indeed demonstrated a measurable priming effect of this kind.

What is more interesting, however, is that this priming effect was also obtained when the prime and the target sentences did not share the same verb (e.g., when *offered* was used in the prime and *handed* was used in the target) and when the verbs used in the prime and target sentences were encoded in a different verb tense and person (e.g., when *was offering* was used in the prime and *handed* was used in the target). The above results indicate that L1 speakers of English "know" that the verbs such as "offer" and "hand" share the same category and combinatorial information (i.e., both participate in PO and DO dative constructions). The above results also indicate that L1 speakers of English "know" that the above verbs share the same featural information (verb tense, verb number), but that such featural information is represented and used separately from both category and combinatorial information. The fact that syntactic priming effects were obtained despite changes in verbs or changes in verb tense or verb number suggests that L1 speakers of English organize their lemma stratum according to these three types of information: category, featural, combinatorial.

Research Question 2

For the purpose of this study, the findings obtained by Pickering and Branigan (1998) are significant in that they describe what "internal grammars" of L1 speakers of English resemble. If L2 learners (French native speakers) can be primed, what insight can we gain into *their* mental representation of syntax, or their internal grammars? Furthermore, how similar are their L2 mental representations to native speaker mental representations?

The second goal of the present study was therefore to determine how L2 learners organize their "mental grammar" with respect to the dative construction in English. To address this goal, the same task (written sentence fragment completion task) was used. Specifically, the task consisted of sentence fragments which primed either for the DO dative (*Mark gave his mother a necklace*) or for the PO dative (*Mark gave a necklace to his mother*). In some cases, the primes and targets shared the same verb (e.g., give); in other cases, the primes and targets featured different verbs (e.g., give vs. hand). Yet in other cases, the primes and targets contained the same verbs encoded in different tense and aspect forms (e.g., is giving vs. gave). If L2 learners organize their mental grammar (with respect to dative alternation in English) the way native English speakers do, then L2 learners should demonstrate syntactic priming in all three cases described above. In other words, L2 learners should show sensitivity to categorical, featural, and combinatorial information available in their mental representations for L2 verbs.

It was predicted that the pattern of syntactic priming effects would depend on the level of L2 learners' proficiency. The participants at an intermediate proficiency level might be 'primeable' for those prime-target combinations that contain only the same

verbs (encoded in the same tense and aspect forms). In other words, intermediate-level learners would only benefit from syntactic structures that feature repeated verbs encoded in identical tense-aspect forms. These learners' knowledge of dative alternation in their L2, as revealed through the pattern of syntactic priming, would thus be relatively "shallow". In contrast, because more advanced learners may become aware of more complex information encoded in L2 verbs, these participants might be 'primeable' for those prime-target combinations that contain different verbs and those that are encoded in different tense and aspect forms. This pattern of syntactic priming results would be indicative of a gradual "attuning" of L2 learners' knowledge of grammar to reflect the structure of L1 speakers' grammars.

CHAPTER 3

METHODOLOGY

Chapter Overview

This chapter reviews the methodology of the present study, including participants, materials, procedure, scoring, design, and data analysis. Details of a pilot study are also discussed.

Participants

Selection of Participants

The participants were 138 native French speakers divided into two groups. The first group included 78 (38 male, 40 female) CEGEP freshman students at the Collège de Shawinigan (mean age: 18.1 years; range: 17-34; *SD*: 3.1), enrolled in three intact intermediate-level English as a Second Language (ESL) classes. The second group included 60 (13 male, 47 female) university undergraduate students at the Université du Québec à Trois-Rivières (mean age: 22.7 years; range: 19-44; *SD*: 6.6), enrolled in two advanced-level ESL classes. All were volunteers recruited through their respective institutional English departments. Henceforth, the two groups of participants will be referred to as CEGEP and University, respectively. The main selection criterion for participation in the present study was the participants' native language, which was French. The secondary selection criterion was that participants be taking an ESL course at the time of the study.

Participants' Background

All participants completed a language background questionnaire in French. The questionnaire (see Appendix A) served to provide detailed information regarding the participants' demographics (e.g., age, gender, place of birth, etc.), language background, as well as their history of language learning and use (i.e., languages spoken at home from childhood to the present, the nature and amount of L2 training, degree of L1 and L2 use, etc.). All CEGEP participants considered French as their L1, reported being exposed to it from birth, and continued to use it at home. All CEGEP participants reported English as their L2. Of the 78 participants for this group, all but three were born in the province of Québec. Two of these three were born in France and one in India. All but one attended primary and secondary school in French-medium institutions.

All University participants also considered French as their L1, reported being exposed to it from birth, and continued to use it at home. All but two participants reported English as their L2, citing Spanish and Arabic as their other L2s. Of the 60 participants for this group, all but four were born in the province of Québec, and all but four attended primary and secondary school in French-medium institutions. These four participants attended primary and secondary schools in English-medium institutions, three in the province of Québec, and one in Ontario. All of the participants except three attended French-medium CEGEPs. Of the 57 who had attended CEGEP, five were enrolled in a Language Study program, where more English courses are compulsory than in other programs of study.

Participants' Language Proficiency Self-Evaluation

All participants from both groups self-rated their L1 and L2 abilities on a 9-point Likert scale (1 = *very poor/très faible*; 9 = *very fluent/excellente*) for the following competencies: speaking, listening, reading, and writing. Participants also indicated the percentage of time, on a scale of 0 to 100%, that they used their L1 (French) and their L2 (English) daily for speaking, listening, reading, and writing. Results of the L1 self-ratings and percentage of time use are reported in Table 1.

Table 1

L1 Self-ratings and Usage

Measure	Group			
	CEGEP (*n* = 78)		University (*n* = 60)	
	M	*SD*	*M*	*SD*
Speaking self-rating[a]	9.0	1.18	9.0	0.65
Listening self-rating[a]	9.0	1.46	9.0	0.41
Reading self-rating[a]	9.0	1.19	9.0	0.61
Writing self-rating[a]	8.0	1.21	8.0	1.55
Speaking use[b]	100	24.40	80	20.44
Listening use[b]	100	26.65	70	22.29
Reading use[b]	100	26.12	40	25.58
Writing use[b]	100	27.34	45	27.00

Note: [a]Measured on a 9-point Likert scale. [b]Measured on an 11-point scale (0-100%).

Participants' L2 Background

The L2 background of the CEGEP group was fairly homogeneous. All but one began learning English in primary school (mean age: 9.25 years; range: 1-13; *SD*: 2.51). Of the 78 participants in this group, 57 (73%) reported learning English in a classroom setting only, 11 (14%) reported learning English both at school and at home (mainly from

media), 7 (9%) reported learning English at school and at work, and 3 (.4%) reported all three environments (school, home, and work) in their L2 learning.

The L2 background of the University group was more varied. Although all but one reported learning English in childhood (mean age: 9.25 years; range: 1-23; *SD*: 3.25), only 24 participants (40%) reported learning English in a classroom setting. The L2 learning environments for the remaining participants were distributed as follows: 14 participants (23%) reported learning their L2 both at school and at home (mainly from media), 5 participants (8%) reported learning English at school and at work, one reported learning English at home and work, and 10 (17%) reported all three environments (school, home, and work) in their L2 learning. A summary of participants' L2 background appears in Table 2.

Table 2

L2 Learning, Self-ratings and Usage

Measure	Group			
	CEGEP (*n* = 78)		University (*n* = 60)	
	M	*SD*	*M*	*SD*
Years of English language learning	8.0	2.51	12.0	6.13
Hours per week of English language learning	3.0	1.79	5.0	9.52
L2 speaking self-rating[a]	6.0	1.18	7.0	1.29
L2 listening self-rating[a]	7.0	1.46	8.0	1.23
L2 reading self-rating[a]	7.0	1.19	8.0	1.16
L2 writing self-rating[a]	6.0	1.21	7.0	1.31
Percentage/day L2 speaking[b]	10.0	24.40	20.0	17.80
Percentage/day L2 listening[b]	20.0	26.65	40.0	21.72
Percentage/day L2 reading[b]	10.0	26.12	50.0	25.67
Percentage/day L2 writing[b]	10.0	27.34	50.0	26.81

Note: [a]Measured on a 9-point Likert scale. [b]Measured on an 11-point scale (0-100%).

Participants' L2 Proficiency

A grammar proficiency test was used to estimate participants' knowledge of English grammar, which was the focus of the present study. This measure was obtained during the experimental session. The test was a retired version of the structure section of the Test of English as a Foreign Language (TOEFL). The measure contained 20 items included to test general grammar (G) knowledge, as well as 15 additional items designed to test the participants' knowledge of dative alternation (DA) grammar. Details of the actual test are discussed in the materials section below.

As was anticipated prior to the study, the overall CEGEP participants' scores (mean score: 34% correct; range: 14-80%; *SD*: 14.9) for G and DA items combined were lower than those of their University counterparts (mean score: 83% correct; range: 43-97%; *SD*: 12.1). Further examination of the general (G) and dative alternation (DA) subsections separately confirmed the above trend. The CEGEP participants' scores for subsection G (mean score: 40% correct; range: 9-70%; *SD*: 18.5) and subsection DA (mean score: 33% correct; range: 0%-67%; *SD*: 17.3) contrasted with the University participants' scores for subsection G (mean score: 85% correct; range: 27-100%; *SD*: 14.6) and subsection DA (mean score: 80% correct; range: 40-98%; *SD*: 12.6). Table 3 below contains a synthesis of the above results.

Table 3

L2 Grammar Proficiency Results (Percent Correct)

Section	Group			
	CEGEP (*n* = 78)		University (*n* = 60)	
	M	*SD*	*M*	*SD*
Overall	34.0	14.9	83.0	12.1
General grammar subsection (G)	40.0	18.5	85.0	14.6
Dative alternation subsection (DA)	33.0	17.3	80.0	12.6

There were no other proficiency measures used in this study. It should be noted, however, that the CEGEP students were placed in levels which correspond to the degrees of competency obtained in their last year of high school. Unless an advanced degree of mastery was apparent prior to admission, the University level participants were required to sit the TOEIC (Test of English as International Communication) and participate in an oral interview which is loosely based on the Student Oral Language Observation Matrix (SOLOM) scale. The minimum score required for the TOEIC is 750, and the minimum score required for the SOLOM is 16. This suggested that the University students' overall proficiency level was higher than the CEGEP students' proficiency level, as predicted in Chapter 2.

Materials

The materials used in this study included (a) an English grammar proficiency test and (b) experimental sentence sets.

English Grammar Proficiency Test

A paper-and-pencil test, representing the structure section from a retired version of the TOEFL test (Test of English as a Foreign Language), was used as a grammar

proficiency measure. See Appendix B for sample TOEFL materials. The test included 20 questions relating to general grammar and sentence structure. There were two types of such general (G) questions. Questions of the first type included four underlined sentence elements. One of those elements contained an error, and participants had to identify it. For example, in the sentence, "*Acoustical engineer is concerned with the technical control of sound*", participants had to circle the incorrect underlined item "engineer" (which should read engineering). Questions of the second type contained a missing sentence element, and participants had to choose from among four options to complete each sentence. For example, for the sentence, "*The Mayflower was bound for Virginia, but a hurricane ___ off course*", participants had to choose from the following alternatives to complete it: (a) blew it (b) to blow it (c) it blew (d) blowing it. The correct answer in this case is (a) blew it.

Fifteen additional questions intended to measure the participants' knowledge of the dative alternation (DA) constructions were randomly distributed throughout the test. One example of a DA question was the following: "*At a critic point in the final match, the quarterback summoned his strength and threw the receiver the ball.*" In this sentence, participants had to circle the incorrect underlined item. In this case, the DA construction is correct, but the option to be chosen is "critic". Another example of a DA question was "*When opened in 1918, the Philips Collection in Washington, D.C. was the first museum in the United States to offer modern art at the American people.*" In this case, the dative alternation construction "at the American people" is incorrect, and should read "to the American people". The results of this test were used later to assign the participants to grammar proficiency levels with respect to their knowledge of L2 grammar.

Experimental Task

The main experimental task consisted of a written sentence-completion task. This task is based on the task used by Pickering and Branigan (1998), adapted to account for differences in language variety (e.g., using "mail" in a North American context in place of "post") and differences in proficiency levels of participants (Pickering and Branigan tested native English speakers). Most adaptations of Pickering and Branigan's materials involved changes in vocabulary items (e.g., replacing "lifebelt" or "barrister" with simpler, proficiency-appropriate words).

The critical materials for the sentence-completion task included prime-target sentence fragment pairs. The prime fragments exemplified the English dative alternation structures, namely DO and PO datives. There were 32 prime and 32 target sentence fragments. In addition, there were 160 filler sentence fragments. Therefore, the total number of sentence fragments (including prime-target sequences and fillers) was 224. The 224 items were assembled into three types of colour-coded booklets, representing three separate experimental conditions. All prime sentence fragments were directly followed by corresponding target fragments. Filler sentence fragments were randomly inserted between prime-target sequences to minimize the opportunity for participants to become aware of the linguistic construction focused on here.

In the first booklet (Booklet A), the 32 PO and DO inducing primes followed by a target included the same verb in the same tense form (i.e., simple past). A sample prime-target sequence in this booklet is the following (PO-inducing prime followed by a target):

The ticket clerk sent a letter...

The kidnappers sent....

This experimental condition was set up to determine if L2 learners can be primed to reuse a dative construction when the same verb (encoded in the same tense form) is used in both prime and target sentence fragments.

In the second booklet (Booklet B), the 32 PO and DO inducing primes followed by a target included the same verb in a different tense and aspect form (i.e., simple past and present progressive). A sample prime-target sequence of this kind is the following (DO-inducing prime followed by a target):

The teacher gave his students...

The lawyer is giving....

This experimental condition, in turn, was created to determine if L2 learners can be primed to reuse a dative construction when the same verb used in prime and target fragments is encoded in different tense-aspect forms.

In the third booklet (Booklet C), the 32 PO and DO inducing primes followed by a target included different verbs encoded in the same (simple past) tense form (e.g., gave, offered). A sample prime-target sequence of this type is the following (PO-inducing prime followed by a target):

The fashion designer offered a dress...

The firefighter showed....

Finally, this condition was designed to determine if L2 learners can be primed to reuse a dative construction when two different verbs are used in prime and target fragments.

Each of the three target booklets (representing one of the three experimental conditions, as described above) included essentially the same materials. The only difference between the materials used in the three booklets involves different tense-aspect

forms of verbs used (e.g., *gave-gave* [same verb] in Booklet A vs. *gave-is giving* [same verb different tense-aspect] in Booklet B) or different verbs used (e.g., *gave-gave* [same verb] in Booklet A vs. *gave-offered* [different verbs] in Booklet C). Therefore, the same participants could not be asked to complete all three booklets of sentence fragments. Thus, each booklet was handed out as proportionately as possible within each group in each testing venue: CEGEP and University. That is, Booklets A, B, and C were distributed as evenly as possible within the three separate groups of CEGEP students; the same booklets were distributed as evenly as possible within the two groups of university students. The assumption here, prior to obtaining and analyzing the participants' L2 proficiency scores, was that the University students would be higher in their English proficiency than their CEGEP counterparts.

Pilot Study

A pilot study was conducted prior to the main experimental study. The intent here was to insure that a priming effect could be elicited for native English speakers with the materials described above. That is, the first reason for the pilot study was to validate the written sentence completion task as a whole. The second reason was to evaluate whether the individual items included in the task elicited the priming effect. In other words, the results of the pilot study were used to test and improve the materials to be used in the main experimental study. Therefore, the results of the pilot study are presented here, before the testing procedure of the main experimental study is described.

Pilot Participants

One important factor in the choice of a potential participant population for the pilot study was the need to test monolingual English speakers. Given that there are relatively few speakers whose native language is not English in the greater-Montreal area and that it is therefore difficult to find English monolinguals, the choice was made to test in the United States. All pilot testing was therefore conducted at a large English-medium private university in Northwestern United States.

The participants were 95 (39 male, 56 female) volunteers recruited through the Department of Linguistics and English Language (mean age: 22.6 years; range: 18-67; *SD*: 5.4). All participants except one were students at the university at the time of testing; one participant was a university employee. All participants considered English to be their L1, and 44 reported English as their only language. In terms of these participants' L2s, 27 reported Spanish as their L2, 10 reported German, 7 reported Russian, and 7 reported Korean.

Pilot Materials and Procedure

The materials used in the pilot study included (a) a background questionnaire, and (b) experimental sentence sets (as described above). The composition of verbs in the experimental sentence sets and their distribution per booklet can be found in Table 4.

Table 4

Verb Composition and Frequency by Booklet (Pilot)

Verb	Booklet			
	A	B	C	
			prime	target
show	12	12	6	6
send	12	12	6	6
give	8	8	4	4
offer	8	8	4	4
write	6	6	3	3
read	6	6	3	3
throw	4	4	2	2
mail	4	4	2	2
email	4	4	2	2
Total	64	64	32	32

Because of class period constraints at the university where the pilot study was conducted (50 minutes), the booklets containing both the sentence completion task and the background questionnaire were distributed to the participants with instructions that both be completed at home. Participants were asked to set aside at least 45 minutes to complete the task, and to attempt to complete the task in one sitting. The participants were then asked to return the completed booklets to the original contact person in the Linguistics and English Language Department.

Pilot Results

The data obtained from the sentence completion task were submitted to statistical analyses. Analyses for Booklet A ($n = 32$) revealed no significant priming for either PO or DO datives. Analyses for Booklet B ($n = 29$) revealed significant priming for DO, but no equivalent priming for PO. For Booklet C ($n = 34$), there was significant priming for PO, but no equivalent priming for DO. For all three booklets combined ($N = 94$), there was significant priming for PO, but none for DO. To summarize, these analyses revealed

three significant results out of a possible eight significant priming effects.

Revising Experimental Task Materials

Given that a significant proportion of the items used in the pilot study elicited responses scored as "Other", a finer-grained analysis of sentence completions in the pilot test was conducted. This analysis revealed that some items were consistently eliciting "Other" responses. "Other" responses represent sentence fragment completions which do not include a dative alternation construction (ether a PO or a DO construction). A large number of "Other" responses given to a prime-target sequence, therefore, indicates that this sequence fails to elicit a particular construction which it was set up to elicit. Based on these findings, the decision was made to replace the verbs that elicited over 70% of "Other" responses with other verbs. For Booklet A, 8 changes were made to the experimental sets; for Booklet B, 13 changes; and for Booklet C, 9 changes. Overall, these changes involved replacing the verbs that consistently elicited "Other" responses with the verbs that "behaved" as intended and elicited a fair proportion of PO or DO dative alternation responses. As a result of these changes to the experimental task materials, the total number of different verbs used in each booklet was reduced while the number of tokens for certain verbs (those that consistently elicited priming; e.g., *show*, *give, send, offer*) was increased. An overview of revised verb frequencies is shown in Table 5.

Table 5

Verb Composition and Frequency by Booklet (Final Experimental Materials)

Verb	Booklet			
	A	B	C	
			prime	target
show	14	14	7	7
give	14	14	7	7
offer	14	14	7	7
send	10	10	5	5
hand	6	6	3	3
throw	4	4	2	2
write	2	2	1	1
Total	64	64	32	32

Procedure

Setting and Pre-Experimental Task

Participants were invited to attend experimental sessions conducted in two classroom venues: The Collège Shawinigan (3 separate testing sessions conducted) and the Université du Québec à Trois-Rivières (2 separate testing sessions conducted). First, the researcher introduced herself and stated the reason for the study. Time constraints (a 60-minute class period at the University and a 50-minute class period at the CEGEP) required that the task sequence be changed somewhat from what had been planned prior to the actual trials. The researcher, therefore, proceeded to explain what tasks were to be performed in the classroom, and what tasks were to be done after the end of the experimental session. Subsequently, the participants were handed all the materials which consisted of the task booklet itself, consent forms, a language background questionnaire, and the English grammar proficiency test. They were then asked to sign the consent forms.

Experimental Phase

The experimental phase consisted of a written sentence completion task. The procedure in the experimental phase was as follows. The participants were informed that the researcher was interested in the quality of student writing and were instructed to complete the sentence fragments in as short a time as possible. The researcher also encouraged participants to complete the fragments with the first phrase that came to mind. The time limit for this task depended on the venue, with approximately 50 minutes at the CEGEP testing sessions and 60 minutes at the University testing sessions.

Upon completion of the written sentence completion task, the participants were invited to insert one of the two signed consent forms into the booklet, remove the language background questionnaire and the grammar proficiency test, and then hand in the booklets to the researcher. They were then instructed to complete the language background questionnaire and the English grammar proficiency test outside the class, and to hand them back to their instructor before the following class.

Scoring

The data from the main task were scored in keeping with Pickering and Branigan (1998), yet the scoring was adapted to account for the fact that participants' L1 was not English. If both the prime and the target experimental fragments were completed by a participant, the target fragment was scored as one of three types: PO, DO or Other. For the target fragment to be coded as PO, the completion had to contain a noun phrase, followed by the preposition *to*, followed by another noun phrase. For example, the fragment "The firefighter offered..." completed with "*a golden ring to his fiancé*" was

considered a PO completion. For the target fragment to be coded as DO, the completion had to contain two juxtaposed noun phrases. For example, the fragment "The little girl is giving..." completed with "*her brother a [b]arbie doll*" was considered a DO completion. Any completions not corresponding to one of the two above conditions were scored as "Other". For example, the fragment "The man showed..." completed with "*remorse for the way he had acted*" was considered to be an "Other" completion.

During the scoring process, francophone learners' errors which did not affect the essential structure of the English dative alternation constructions were ignored. Specifically, such errors included inappropriate use of prepositions (e.g. *The girl gave the doll at her babysitter*), possessive determiners (e.g. *The girl gave his boyfriend a kiss*), articles (e.g. *The goalie threw the soccer ball to the number 3*), and spelling errors (e.g. *The kidnappers sent an envelop to the officer)*. Although all these errors represent non-native uses of English, they do not affect the structural configuration of the English dative alternation construction (either PO or DO). Therefore, the decision was made to score the sentences such as ones shown above as PO or DO completions.

To account for missing completions within an otherwise completed booklet, another scoring category was used. For those experimental prime-target sets completed with a target completion only (i.e., when the prime was not completed and therefore not processed), or alternately, for prime-target sets incomplete for both prime and target completions, the experimental sets were scored as DNA (did not answer). Finally, there was another scoring category specific to those prime-target sets that were parts of an unfinished booklet. For example, some participants could not finish completing their booklets in the allotted testing time. They could, for example, stop completing their

booklets after the 20th prime-target sequence, leaving the remaining 12 prime-target sequences (of a total of 32 in each booklet) as incomplete. These unfinished (and therefore incomplete) prime-target sequences were scored as DNF (did not finish).

Research Design

The research design used in this study was a 2 (proficiency) × 3 (priming condition) factorial design. There were two levels of the proficiency factor: (1) intermediate (CEGEP students) and (2) advanced (University students). There were three levels of the priming condition factor: (1) same verb & same tense/aspect condition (Booklet A), (2) same verb & different tense/aspect condition (Booklet B), and (3) different verb condition (Booklet C).

Dependent Variables

The dependent variables used in this study corresponded to a 2 × 2 matrix. These included: (1) the proportion of DO dative completions following DO primes, (2) the proportion of PO dative completions following PO primes, (3) the proportion of DO dative completions following PO primes, and (4) the proportion of PO dative completions following DO primes.

Data Analysis

The target fragments allowed three completion possibilities, based on the dative alternation induced (PO and DO). One possibility was for the participants to complete the target fragment with a DO dative. Another possibility was for the participants to complete the target fragment with a PO dative. The final possibility was for the participants to

complete the target fragment with another phrase (Other), unrelated to either PO or DO.

All sentence completions involving dative alternations were tallied and organized into

four categories, according to the four types of dependent variables described above. All

Other completions were also tallied to determine the rate of non-target (non-dative)

responses after each type of prime.

CHAPTER 4

RESULTS

Chapter Overview

This chapter includes an analysis of the results obtained for this study, and

attempts to examine the conditions under which syntactic priming can be observed.

Descriptive Analyses

As described in the scoring section above, there was a great deal of variability in

sentence fragment completion rates. Several participants, especially those in the CEGEP

group, did not have enough time to complete the entire set of 224 sentence fragments.

This resulted in a number of missed target sentence completions. These missed target

sentence completions took two forms: those items the participants did not answer (DNA)

and those items that the participants did not finish (DNF). The highest attrition rates were

observed in the data obtained from the CEGEP participants ($n = 78$). Specifically, three

of the CEGEP participants did not answer (DNA) 24 targets out of a possible 32 targets

(75%), and two participants did not answer 26 targets (81%). Two of the CEGEP

participants did not finish (DNF) 24 targets out of a possible 32 (75%), one did not finish

25 and one did not finish 26 (81%). For the University group ($n = 60$) only one

participant did not answer (DNA) 16 targets, or 50%. Two of the University participants

did not finish (DNF) 13 targets out of a possible 32, or 41%. Table 6 summarizes attrition

rates for the CEGEP and University groups, for both DNA and DNF counts.

Table 6

Attrition Rate Means and Standard Deviations (Appearing in Parentheses)

Attrition	Group	
	CEGEP	University
DNA	7.0 (7.66)	1.78 (3.69)
DNF	10.68 (7.14)	2.37 (13.82)

Further analyses of these data revealed that the CEGEP participants completed the PO primes at a rate of 20% and the DO primes at a rate of 13%. Their University counterparts completed the PO primes at a rate of 38% and the DO primes at a rate of 19%. The following analyses focused on whether these prime completions influenced the participants' production of PO and DO datives in the target sentence fragments.

Overall Priming

The goal of the first set of analyses was to determine if there was overall syntactic priming for PO and DO completions for the two participant groups (CEGEP and University). Priming effects would be demonstrated if the participants showed a tendency to produce more PO target completions following PO prime completions than following DO prime completions, and more DO target completions following DO prime completions than following PO prime completions. Overall PO and DO completion rates (counted as proportions of PO or DO completions over the total number of all completions) are presented in Table 7.

Table 7

Overall Priming Rates (Proportions) and Standard Deviations (Appearing in Parentheses)

| Prime | CEGEP | | University | |
| | Target | | Target | |
	PO	DO	PO	DO
PO	.24 (.24)	.20 (.20)	.39 (.19)	.36 (.20)
DO	.16 (.24)	.18 (.26)	.17 (.16)	.19 (.17)

These individual PO and DO completion rates following PO and DO primes were then submitted to paired-samples t-tests, separately for the two participant groups (CEGEP and University) and then for the entire participant sample (combining both groups). Because six such t-tests were carried out (two for each participant group and two others for the entire sample of all participants combined), the alpha level for significance was adjusted using a Bonferroni correction ($\alpha = .008$). For the CEGEP group, these t-tests yielded no significant t ratios: $t(71) = 1.37$, $p = .18$, for PO completions, and, $t(71) = -.82$, $p = .42$, for DO completions. For the University group, t-tests similarly yielded no significant t ratios: $t(59) = .93$, $p = .36$, for PO completions, and, $t(59) = -1.74$, $p = .09$, for DO completions. Likewise, for all participants combined, there were no significant priming effects: $t(130) = 1.66$, $p = .10$, for PO completions, and, $t(130) = -1.53$, $p = .13$, for DO completions. A summary of prime and target completion rates in terms of the proportions of PO, DO, and Other responses for each group appears in Table 8. These analyses suggest that there was no overall syntactic priming either for PO or DO datives, and that a large number of prime and target responses were Other responses (i.e., not PO or DO datives).

Table 8

Completion Rates (Proportions) by Group

	CEGEP			University		
Prime	Target			Target		
	PO	DO	Other	PO	DO	Other
PO	.20	.20	.63	.39	.17	.44
DO	.19	.18	.63	.36	.20	.44

Priming in Different Conditions

The goal of the next set of analyses was to determine if there were significant

priming effects, separately for each of the three experimental conditions used in this

study (same verb, same verb/different aspect, different verb). These three conditions were

tested using three booklets of experimental materials: Booklets A, B, and C, respectively.

As before, priming effects in each of the three conditions would be demonstrated if the

participants showed a tendency to produce more PO target completions following PO

prime completions than following DO prime completions, and more DO target

completions following DO prime completions than following PO prime completions.

Individual PO and DO completion rates following PO and DO primes for all

participants combined (CEGEP and University) were submitted to six paired-samples t-

tests (two tests for each of the three booklets). Again, because six separate pairwise

comparisons were made, the alpha level for significance was adjusted using a Bonferroni

correction ($\alpha = .008$). For Booklet A (same verb) condition, these tests revealed no

significant priming effects: $t(51) = .89$, $p = .38$, for PO completions, and $t(51) = -1.43$, p

$= .16$, for DO completions. For Booklet B (same verb, different aspect) condition, there

were no significant priming effects: $t(47) = .56$, $p = .58$, for PO completions, and $t(47) = .59$, $p = .56$, for DO completions. Similarly, for Booklet C (different verb) condition, t-tests revealed no significant priming effects: $t(30) = 1.40$, $p = .17$, for PO completions, and $t(30) = -1.46$, $p = .16$, for DO completions. A summary of prime and target completion rates in each of the three experimental conditions appears in Table 9.

In sum, no significant priming effects were revealed for any of the three experimental conditions studied here. Taken together, the first two sets of analyses reported above (overall priming by group and overall priming for each experimental condition) failed to reveal any significant priming effect.

Table 9

Overall Priming Rates (Proportions) and Standard Deviations (Appearing in Parentheses) In Each Experimental Condition

Prime	Booklet A		Booklet B		Booklet C	
	Target		Target		Target	
	PO	DO	PO	DO	PO	DO
PO	.31 (.23)	.28 (.20)	.26 (.23)	.24 (.23)	.38 (.22)	.31 (.23)
DO	.18 (.20)	.23 (.23)	.10 (.18)	.09 (.12)	.22 (.26)	.28 (.27)

Does Priming Depend on Both Participant Group and Priming Condition?

The results presented thus far indicate that there were no reliable priming effects, either for PO or DO completions, when the data were examined separately for each participant group (CEGEP, University) or separately for each condition (Booklet A, Booklet B, Booklet C). In other words, in both previous analyses, the data for all three conditions or for both groups of participants were combined. However, it is possible that

the condition factor interacts with the participant group factor, such that, for example, University students may be likely to show priming effects in some conditions but not others.

To examine whether priming effects depended on the participant group and on a particular condition, individual PO and DO completion rates following PO and DO primes were submitted to a series of two-way repeated-measures analyses of variance (ANOVAs) separately for CEGEP and University students. In these ANOVAs, condition (Booklet A, Booklet B, Booklet C) served as a between-subjects factor, and priming (PO completion following PO prime, PO completion following DO prime; or DO completion following DO prime, DO completion following PO prime) served as a within-subjects factor.

For CEGEP students' PO completions ($n = 71$), a two-way ANOVA yielded no significant main effects for priming, $F(1, 68) = 2.03, p = .16$, and for condition, $F(2, 68) = 5.5, p = .006$, and no significant priming × condition interaction, $F(2, 68) = .13, p = .88$. For the same group's DO completions, a similar two-way ANOVA yielded no significant main effects for priming, $F(1, 68) = .64, p = .43$, and for condition, $F(2, 68) = 3.6, p = .03$, and no significant priming × condition interaction, $F(2, 68) = 2.11, p = .13$. These findings suggest that, for CEGEP students, no priming effects were observed for either PO or DO completions in any of the three conditions.

For University students' PO completions ($n = 60$), a two-way ANOVA yielded no significant main effects for priming, $F(1, 57) = 1.26, p = .27$, and for condition, $F(2, 57) = .20, p = .82$, and no significant priming × booklet interaction $F(2, 57) = .53, p = .59$. In contrast, for the same group's DO completions ($n = 60$), there was a significant main

effect for priming, $F(1, 57) = 3.96$, $p = .05$, but no significant main effect for condition, $F(2, 57) = 6.34$, $p = .003$, or a significant priming × condition interaction, $F(2, 57) = 1.08$, p = .35.

To sum up, the only finding of this series of analyses is that there was overall priming for DO datives, and only for the University students. Note, however, that an overall *t*-test examining priming for the University students' DO completions above failed to find a significant priming effect. This discrepancy in findings points to a very subtle nature of the DO priming effect found here for the University students and suggests that this effect is not robust or reliable.

Does Priming Depend on Participants' Grammar Proficiency?

The analyses reported above overall failed to reveal any substantive findings. In light of the sole significant main effect, that for the University students' DO completions, further analyses were warranted. Thus, another set of ANOVAs were conducted using the grammar proficiency measure. As discussed in Chapter 3, the general grammar questions (G) sought to measure overall grammar proficiency, while the dative alternation grammar questions (DA) sought to measure knowledge of the grammatical structure focused on in the sentence completion task. The goal of these analyses was to determine if participants with higher grammar knowledge were more likely to show priming effects than participants with lower grammar knowledge.

Therefore, in the following analyses, PO and DO completion rates were analyzed for all participants re-organized into two new groups—the high grammar proficiency group and the low grammar proficiency group. The high and low grammar proficiency

groups were defined in two ways: by using each participant's G and DA grammar scores from the grammar proficiency test. Those participants who scored higher than the median G score of 12 (range: 1-20) for the entire participant sample were assigned to the High G group. Those that scored lower than the median G score of 12 were assigned to the Low G group. Similarly, those participants who scored higher than the median DA score of 7 (range: 0-15) for the entire participant sample were assigned to the High DA group. The rest were assigned to the Low DA group. In all subsequent analyses, priming (proportion of PO and DO completions after PO and DO primes) was considered a within-subjects factor and grammar proficiency (Low G, High G; or Low DA, High DA) was considered a between-subjects factor. Of particular interest in these analyses are significant main effects of priming and/or significant priming × grammar proficiency interactions. A significant main effect of grammar proficiency is expected in each of these analyses because the two groups (High, Low) were defined by dividing the participants using a median split based on grammar proficiency scores.

The first two analyses examined priming effects for the High and Low G groups. For PO completions (n = 131), a two-way ANOVA yielded no significant main effect for priming, $F(1, 129) = 2.88$, $p = .09$, and no significant priming × grammar proficiency interaction, $F(1, 129) = .20$, $p = .66$. For DO completions, again there was no significant main effect for priming, $F(1, 129) = 1.67$, $p = .20$, and no significant priming × grammar proficiency interaction, $F(1, 129) = 2.51$, $p = .12$.

The next two analyses examined priming effects for the High and Low DA groups. For PO completions, a two-way ANOVA yielded no significant main effect for priming, $F(1, 129) = 2.56$, $p = .11$, and no significant priming × grammar proficiency

interaction, $F(1, 129) = .97, p = .33$. For DO completions, no significant main effect for priming was found, $F(1, 129) = 2.05, p = .16$. However, there was a significant priming × grammar proficiency interaction, $F(1, 129) = 4.85, p = .03$. Further pairwise comparisons (adjusted using a Bonferroni correction) revealed that there was an overall priming for DO completions, but only for High DA grammar students ($p = .009$). Table 10 below summarizes the findings for the DA grammar proficiency measure.

Table 10

Overall Priming Rates (Proportions) and Standard Deviations (in Parentheses) as a Function of DA Grammar Proficiency

| Prime | High DA Grammar | | Low DA Grammar | |
| | Target | | Target | |
	PO	DO	PO	DO
PO	.40 (.20)	.17 (.17)	.21 (.21)	.16 (.26)
DO	.34 (.21)	.22 (.21)	.20 (.20)	.15 (.23)

In sum, the final set of analyses revealed a significant effect for DO completions for those participants (CEGEP and University combined) who scored high on the dative alternation (DA) grammar proficiency measure.

CHAPTER 5

DISCUSSION

Chapter Overview

This chapter includes a discussion of the findings obtained for this study in light of the two research questions: priming as implicit learning and priming as a window into mental representations.

Summary of Findings

As discussed in Chapter 4, statistical analyses of the results of the written sentence completion task revealed one significant priming effect for DO dative completions, but not for PO dative completions, and only for the participants from the University group. Subsequent analyses also revealed one significant priming effect for DO completions for participants who scored above the median split (receiving high scores) on the dative alternation section of the grammar proficiency measure.

Priming as Implicit Learning

The first goal of the present study was to investigate syntactic priming as an implicit learning phenomenon in L2 learners. Given that measurable syntactic priming effects are often considered to be indicative of implicit learning, it was important to demonstrate that L2 learners can partake of this kind of learning. The present study was conceptualized as both a replication and an extension of the work previously conducted by McDonough and her colleagues (Kim & McDonough, 2008; McDonough, 2006;

McDonough & Mackey, 2006). These researchers, using confederate scripting technique and analyses of oral interaction, showed that at least some advanced L2 learners demonstrate syntactic priming effects for prepositional datives and in question formation in English. In the present study, a different methodology (written sentence completion) was used to replicate and extend these findings with two groups of francophone learners of English of intermediate and advanced levels of proficiency (CEGEP and University students).

It was predicted that the learners would demonstrate syntactic priming in written sentence completion for at least one of the two syntactic structures featured here—PO dative (common in the learners' L1, French) as opposed to DO dative (less common in French). However, the findings of the present study revealed that only the University participants demonstrated syntactic priming for DO datives, not PO datives. It was also predicted that the advanced learners would be more likely to show syntactic priming effects than the intermediate learners. The factor that appeared to determine the extent to which the learners showed significant priming effects was not so much their level of overall proficiency (although the University students, not the CEGEP students, did show priming for DO completions). Rather, it was the participants' knowledge of dative alternation (as measured in a test of dative alternation). Those learners who scored high on this test of dative alternation showed a significant syntactic priming effect for DO datives. By contrast, those learners who scored low on this test showed no such priming. The discussion below focuses on three related questions: (1) Why did the learners demonstrate a syntactic priming effect for DO datives but not for PO datives? (2) What is the relationship between syntactic priming and learners' grammar knowledge? and (3)

What is the evidence that the learners in this study benefited from syntactic priming as an implicit learning phenomenon?

Priming for DO versus PO Datives

One prediction of this study was that L2 learners would demonstrate syntactic priming for at least one of the two syntactic structures being tested, namely for PO datives. This prediction was based on the assumption that it would be easier for the learners to demonstrate the priming for the construction that is more common in their native language (PO) than for the construction that is less common (DO). For example, it was predicted that the learners would be more likely to complete the fragment "*The medical secretary handed...*" with "*a file to the doctor*" (PO) than with "*the doctor a card*" (DO). In contrast, the results showed that at least the University students and the students who got a high score on the dative alternation grammar test demonstrated a significant priming effect for the DO but not for the PO dative construction. Thus, for example, these students were actually more likely to complete the fragment "*The medical secretary handed...*" with "*the doctor a card*" than with "*a file to the doctor*".

This finding is consistent with observations made by Pickering and Ferreira (2008) and previously by Ferreira and Bock (2006). These authors discussed syntactic priming effects in terms of an *inverse preference effect*. The inverse preference effect refers to the observable tendency for less frequently encountered syntactic structures to be more "primeable" than more frequently encountered structures. For example, Sheepers (2003) investigated syntactic priming in relative clause attachments and found that "for generally preferred attachments, priming effects turned out to be weaker than for non-preferred attachments" (Sheepers, 2003, p. 198). Similarly, the pattern of priming

observed in some syntactic priming studies is consistent with the inverse preference effect (see Ferreira & Bock, 2006, and Pickering & Ferreira, 2008, for an in-depth review) and is also compatible with the observation that greater priming gains often occur for those syntactic structures that are less frequent in the language or that are less familiar to a language user than for those structures that are more frequent and more familiar (e.g., Hartsuiker et al., 2004).

It is likely that the greater priming effect observed in this study for the less common structure (DO) than for the more common structure (PO) can be attributable to the inverse preference effect. In other words, what was less known by the learner became the object of greater learning than what was already known by the learner. Thus, at least in terms of the syntactic processing underlying the syntactic priming effect, the learners in this study showed a tendency to favour the lesser known structure than the better known structure. The DO construction is the lesser known of the two possible dative alternation constructions because the construction (at least with nouns used as both objects) does not exist in French. French speakers cannot translate *Xavier gave Axel the purple ball* as **Xavier a donné Axel le ballon mauve*. The utterance is simply ungrammatical.

Studies into the inverse preference effect include both experimental (Bernolet, 2008) and corpus (Jaeger & Snider, 2008) research. These studies have thus far focused on the influence of verb bias on syntactic priming. Verb bias, or the apparent preference for a given verb to favour one of the two possible dative alternation structures (PO or DO), is established using corpora. For example, Bernolet (2008) conducted a study using 18 Dutch verbs, which were classified using their frequency distribution in a Dutch

corpus. The 18 verbs were placed in three categories: PO-biased verbs, Neutral verbs, and DO-biased verbs. Bernolet conducted a picture description experiment with these verbs and found a significant interaction between verb bias and the priming effect. Specifically, the more biased a verb was towards a given construction (e.g., PO) the greater the measureable DO priming effect was. Jaeger and Snider (2008) used a logarithmic formula to establish whether the low probability of a construction is associated with greater magnitude of priming, as would be predicted by the inverse preference effect. These researchers used corpora to demonstrate that a lower expectancy of the priming effect (as predicted by verb bias) was in fact associated with a greater obtained priming effect.

Could the obtained priming effect for the DO dative alternation in this study be explained by verb bias? Because no categorized verb list was available in Jaeger and Snider's (2008) study, it is impossible to know if the verbs that elicited DO priming in this study are PO-biased verbs. An attempt to translate the verbs from Dutch to English to determine if the English translations of Dutch verbs would behave in a similar way failed to reveal a parallel between a possible bias of English verbs in this study and the bias of the Dutch translations of these verbs in Bernolet's (2008) study. For example, the three most frequent verbs in the present study were "show", "give" and "offer", with 14 occurrences each. In Bernolet's study, the translated equivalent of the verb "show", *tonen* and *laten zien*, are either neutral or DO-biased. The equivalent of "give", *geven* and *schenken*, are both neutral. Finally, the equivalent of "offer", *aanbieden*, is DO-biased. For both studies to have been similar, the three most frequent verbs in this study would have had to be listed in the PO-biased column in Bernolet's (2008) study. This was not

the case. Nevertheless, it is reasonable to suggest that the inverse preference effect contributed to a higher incidence of priming for DO datives (a less common structure for francophone learners of English) than for PO datives (a more common structure for francophone learners of English).

Another factor which may have increased the likelihood of significant priming effects for DO than for PO datives may be related to learners' increased awareness about the differences between the use of prepositional constructions in English and French. Although dative alternation is hardly ever a focus of any explicit instruction in classroom ESL teaching either at the CEGEP or the University level, the use of prepositions is taught explicitly at varying levels throughout classroom L2 learning. For example, the general syllabus for beginner level English taught at the Collège Shawinigan prescribes explicit instruction for the prepositions "to" and "for". The use of prepositions is often taught explicitly because francophone learners of English often make mistakes in English that are due to negative transfer from French, their L1. For example, if the learner wishes to express a desire to travel to Montreal, the resulting utterance might often resemble *I want to go at Montreal tomorrow. This error is due to transfer from French, whereby the learner uses English "at" in the same way as the preposition à is used in French. In English, however, this sentence is expressed grammatically as I want to go to Montreal tomorrow.

These errors, which are typical in the speech of francophone learners of English, may lead to learners' being more aware and perhaps even wary of any structures that require the use of prepositions, such as the PO dative construction. It is also possible that explicit instruction on prepositions and their use can cause interference for the learners,

leading them to avoid using prepositions. It is possible that the learners in this study consciously avoided using PO datives because they involved the use of prepositions. This avoidance strategy resulted in a low incidence of PO completions and non-significant priming effects for PO datives. If this was indeed the case, then it is perhaps not surprising that no significant priming effect was obtained for PO datives. Syntactic priming is a subconscious, implicit processing phenomenon. Clearly, the use of conscious strategies by the learners (e.g., avoidance) would obliterate any syntactic processing benefits, for example, that would obtain if the learners were simply to complete sentence fragments at ease with any linguistic means at their disposal. To sum up, then, it is likely that a combination of factors (including the inverse preference effect and possibly the learners' conscious avoidance strategy) contributed to the finding of this study that significant priming effects were found only for DO but not PO datives.

Syntactic Priming and L2 Development

The results of the present study also revealed that the advanced learners of English were more likely to show syntactic priming effects than were the intermediate learners. As mentioned earlier, the factor that appeared to determine the extent to which the learners showed significant priming effects was not their level of overall proficiency but their knowledge of dative alternation (as measured in a test of dative alternation). Those learners who scored high on this test of dative alternation showed a significant syntactic priming effect for DO datives. By contrast, those learners who scored low on this test showed no such priming effect. This finding is important. It shows that syntactic priming, as an implicit learning phenomenon, is reflective of L2 development. That is, syntactic priming is indicative of a particular state of the learners' syntactic knowledge

with respect to a given structure. In this study, the more the L2 learners knew about English dative alternation (as demonstrated by their results on the dative alternation test), the more likely they were to show priming effects, at least for DO datives.

A comparison between the present study and a similar study conducted by McDonough (2006) reveals further links between syntactic priming and L2 development. McDonough (2006) investigated syntactic priming in intermediate-level English L2 learners from various L1 backgrounds. As is the case in the present study, the target construction was dative alternation (PO/DO). The task was a picture-matching activity carried out using a confederate scripting technique. The main finding of McDonough's study was that L2 learners showed syntactic priming, but only for PO dative. This finding is in fact the opposite to what was found in this study. Why is this so? If syntactic priming is reflective of learners' developing knowledge of English dative alternation, then there should be some consistency in findings with respect to which of the two dative alternation structures is primeable at each level of L2 proficiency.

One of the reasons proposed by McDonough to account for so few DO completions relates to task effect. McDonough argued that the picture matching and description activity did not supply the appropriate context for participants to respond with DO constructions. In other words, the pictures were not conducive to the use of DO datives in the experimental setting because the participants were not developmentally ready to produce DO datives featuring two nouns.

It appears that the learning of the DO dative construction in English proceeds in a series of developmental stages. Hawkins (1987) showed that L2 learners accept varying structure combinations, (e.g. V_NP_PP, V_NP_NP) progressively. In early stages of

learning, for example, learners are likely to judge the use of personal pronouns in DO

constructions as being grammatical (*The girl gave me a kiss*) and to consider the use of

full nouns in DO constructions as being ungrammatical (*The boy gave Bill a book*).

LeCompagnon (1984) also observed a similar phenomenon. Although LeCompagnon was

more concerned with the use of *to* and *for* in DO datives, all of the correct utterances

from her participants contained personal pronouns. For example, one of her participants

produced the utterance "No one taught me the rule" (LeCompagnon, 1984, p. 58) during

one of the interviews.

This preference for DO datives featuring personal pronouns might have

influenced McDonough's findings. Because in her study the pictures were of agents

acting on patients (e.g., a girl giving a boy a toy) and because the confederate was not

using pronouns in the utterances within the task, the participants (who ostensibly were at

the stage of development when only DO datives with personal pronouns are preferred)

refrained from using a DO dative construction with two full nouns.

By contrast, the task used in the present study (written sentence completion)

allowed and, in fact, encouraged the learners to complete sentence fragments using any

means they preferred, including DO datives with personal pronouns. An examination of

20 randomly selected response booklets from the University and the CEGEP groups (10

from each) revealed that the learners in this study preferred the use of DO datives with

personal pronouns following DO primes. In the 20 examined booklets (320 possible DO

completions), there were 124 DO completions. Of these 81 (65%) contained personal

pronouns (e.g., *The flight attendant gave me some peanuts, The little girl gave him a*

kiss). Furthermore, there was a clear developmental effect in this preference of DO

datives used with personal pronouns. For the CEGEP participants (i.e., learners of lower proficiency), 48 of the total 54 DO completions contained personal pronouns (89%). By contrast, for the University participants (i.e., learners of higher proficiency), only 33 of a total of 70 DO completions contained personal pronouns (47%). Table 11 shows a detailed summary of DO completions by group. This result suggests that the lower proficiency learners in this study clearly preferred (and in fact over-relied on) the use of DO datives with personal pronouns.

Table 11

DO Completions Containing Pronouns by Group

	CEGEP	University	Total
Double Noun Completions	54	70	124
Pronoun Completions	48	33	81

To summarize, then, it would appear that the L2 learners in this study used more or fewer pronouns in completing sentence fragments following DO primes, depending on their dative alternation developmental stage. This pattern of results speaks to the fact that L2 learners can use syntactic features outside their native language boundaries, that they may do so in a well-structured sequence, and that syntactic priming (as a processing phenomenon) is sensitive to these changes in learners' L2 syntactic development. The difference between McDonough's (2006) and this study is that the task used here did supply a context for the use of the DO dative construction, so much so that priming for DO constructions may have overshadowed any alternate priming possibilities.

Syntactic Priming as Implicit Learning

Is there any evidence, then, that the learners in this study benefited from syntactic priming as an implicit learning phenomenon? If a measurable priming effect can be

interpreted as being a possible result of implicit learning, then the significant priming effect obtained for the DO construction in this study may be indicative that implicit learning is the underlying phenomenon at work. The basis for this claim takes theoretical grounding in a review of structural (syntactic) priming by Pickering and Ferreira (2008), in which the authors explore structural priming as a manifestation of implicit learning, among other things. The review surveys three characteristics of syntactic priming which are consistent with implicit learning, and reports four research-based observations that also align with the implicit learning account. For Pickering and Ferreira (2008), structural priming is consistent with the implicit learning account when a prime containing a given syntactic feature is produced and when the subsequent target also contains the same syntactic feature. In their view, the production of both the prime and target with the same syntactic component is a sign that the speaker or writer has "learned" that feature. In this sense, it is possible to conclude that the learners in this study—those who showed a significant syntactic priming effect for DO datives—"learned" something about DO datives in completing prime fragments and were able to use that knowledge in guiding their production of DO datives in completing target fragments.

Another reason for the implicit nature of the priming effects revealed in this study relates to the pervasiveness of priming. A priming effect can be measured across various tasks (e.g., picture description, sentence recall) as well as in a sub-task (e.g., sentence recall during a picture description). For this study, the overall task was written sentence completion, with no explicit sub-task. However, this task included a number of non-target filler sentence fragments which the learners also needed to complete. One informal observation which speaks to the implicit nature of lexical and syntactic choices made by

the learners in fragment completion is the repetition of lexical items in the filler sentence portions of the task. For example, one participant used the word *hug* in five consecutive filler sentences, as well as in two consecutive target completions. The same participant used the phrase *go to Paris* in two consecutive filler sentences. This repetition of lexical (NP) and syntactic (V_NP) chunks in the learners' completions of filler sentence fragments suggests that the learners, at least to some extent, were not guided by explicit strategies on this task.

One other observation highlighted in Pickering and Ferreira (2008) which is pertinent to the present study is that the priming effect occurs independently of explicit memory. For example, upon completion of the main experimental task, participants are often debriefed about what they noticed during the task or what their strategies were (Bock, 1986), or are asked to recall specific sentences they produced (Bock, Loebell, & Morey, 1992). However, participants are frequently unable to recall any changes in their register or type of sentences they produced, even if a measureable priming effect for dative alternation was observed (see Bock, 1986). In the present study, there was no debriefing. In an informal post-study conversation with one of the University participants, however, it was observed that the overall impression of the task related more to the multiple occurrences of the various verbs used in the sentence fragments than to a particular syntactic structure (i.e., dative alternation). The absence of any reference to sentence structure on the part of this participant is similar to the observation made by other researchers studying syntactic priming, namely, that participants are unable to verbalize the syntax encountered during the experiment.

Finally, an implicit learning account of the priming effects obtained here is supported by the fact that the learners in this study received no explicit instruction on the English dative alternation in the semester previous to the trial. Neither the CEGEP instructor, nor the University instructor reported having explicitly taught dative alternation in any of the courses from which the participants had been drawn. Further examination of the CEGEP syllabus for the intermediate-level ESL courses revealed no mention of the target structure. For that matter, even the task per se did not tap into any explicit memory for the learners, given its unfamiliar nature. Of all the tasks used in an ESL classroom, as activities or in evaluation, the written sentence completion exercise used in this study is the most uncommon. It was a task unfamiliar to both the CEGEP and University instructors, but especially to the learners. Given all these broad parallels between the findings of this study and the workings of implicit learning, it is reasonable to propose that the significant priming effects found in this study were implicit in nature.

Priming and Syntactic Representations

The second research question for this study related to the use of priming as a tool to reveal how L2 learners organize their syntactic system or their internal grammars. The second goal of the present study was therefore to determine how L2 learners organize their "mental grammar" with respect to the dative construction in English. To address this goal, the materials used in the written sentence completion task were divided into three sets, such that each set highlighted a special prime-target relationship. In the first set (Booklet A), the primes and targets shared the same verb (e.g., give). In the second set (Booklet B), the primes and targets featured different verbs (e.g., give vs. hand). Yet in

the final set (Booklet C), the primes and targets contained the same verbs encoded in different tense and aspect forms (e.g., is giving vs. gave). The prediction was that if L2 learners organize their mental grammar (with respect to dative alternation in English) the way native English speakers do, then L2 learners would demonstrate syntactic priming for all three sets of prime-target relationships. In other words, L2 learners would show sensitivity to categorical, featural, and combinatorial information available in their mental representations for L2 verbs.

However, if learners' state of L2 grammars depended on learners' L2 proficiency, then it was predicted that learners at an intermediate proficiency level would be 'primeable' for those prime-target combinations that contain only the same verbs (encoded in the same tense and aspect forms). In other words, intermediate-level learners would be likely only to benefit from syntactic structures that feature repeated verbs encoded in identical tense-aspect forms. These learners' knowledge of dative alternation in their L2, as revealed through the pattern of syntactic priming, would thus be relatively "shallow". By contrast, more advanced learners would be likely to also benefit from those prime-target combinations that contain different verbs and those that are encoded in different tense and aspect forms. This pattern of syntactic priming results would be indicative of a gradual "attuning" of L2 learners' knowledge of grammar to reflect the structure of L1 speakers' grammars.

The findings of this study revealed no significant priming effects (either for PO or DO datives) when the data were analyzed separately for each of the three sets of the prime-target relationships. In this sense, the data obtained in this study provided no insight into the internal workings of L2 learners' grammar. Why were no significant

priming effects revealed for each of the three sets of prime-target relationships, even for the advanced-level participants?

The main possible reason for this null finding is likely related to a large number of missing or unusable data yielded by this experiment. Thus, the statistical tests carried out on each of the three sets of prime-target relationships had low statistical power in detecting any priming effects. Indeed, the only significant priming effects appeared only when the data from all three sets of prime-target relationships were considered together. The missing and unusable data points in this study were of two kinds. First, there were those responses that came from target fragments completed with a structure that was other than PO or DO datives. In fact, the proportion of such Other responses corresponded to over 51% of the total possible completions. In other words, despite all the efforts made to ensure that the prime and target sentences would be completed with a dative construction, the learners tended not to use such constructions. This completion rate for Other responses contrasts with that found in Pickering and Branigan's (1998) original experiment with native speakers of English, where the percentage of Other completions was only 10%. The second type of missing and unusable data points included responses that were left incomplete either because the participants skipped them (did not answer, DNA) or because they ran out of time (did not finish, DNF). These two kinds of responses accounted for 15% and 22% of the total possible responses, respectively.

It is clear that the written sentence completion task posed some challenges to L2 learners in terms of both the length and nature of the task. Specifically, the time on task for this study, which varied between 50 minutes (CEGEP) and 60 minutes (University),

contrasted sharply with the original study (Pickering & Branigan, 1998) where the authors reported that booklet completion took 30 minutes for native speakers. The high attrition rates, as compared to native speaker studies, may thus be a consequence of the difficulty experienced by the learners due to task length and task unfamiliarity.

The written production nature of the task may also have been an issue for the learners, especially those at the intermediate level. As a comparison, consider that the students in intermediate-level English at the CEGEP are required to write a 250-word essay at the end of their semester, and that the task in this study contained a total of 224 sentences to complete. Presuming that a CEGEP participant could have completed all the sentence fragments contained within the booklet, they would have committed more words to paper during a 50-minute experimental session than during their entire English final exam.

Thus, task effect appears to be a plausible explanation for the difficulty experienced by the learners in completing sentence fragments in this study. As stated previously, the written sentence completion task used in this study is a highly uncommon task for an L2 learner, regardless of proficiency level. In an L2 context, this task may tap into some cognitively taxing processes, such as brainstorming, or rehearsal. As investigated in Sheehan and Mislevy (2001), comprehension of the stem or sentence fragment, with all its semantic and syntactic components, is a prerequisite to successfully carrying out the sentence completion task. It is likely that the L2 learners in this study had some difficulty in fully comprehending prime sentence fragments and in completing target sentence fragments. Thus, the task proved simply too demanding of L2 learners, hence limiting the scope of the results.

Limitations

There are several limitations of the present study. Firstly, as was discussed above, the priming task appeared to be too long and perhaps too unfamiliar for the learners. Even for the most advanced University students, the task took one hour to complete for the most part. The priming task was also fairly difficult for the intermediate CEGEP participants and for some of the advanced University participants. In fact, the numbers of DNA and DNF responses (15% and 22%, respectively) speak to this limitation. Pickering and Branigan (1998) reported no such data attrition in their study. Despite this, the written sentence completion task remains appealing, given the possibility of testing numerous participants in one sitting. One possible alternative in terms of task length would be to use the measure from Pickering and Branigan's (1998) second experiment, which contained 12 sets of prime-target sentence fragments and 72 filler fragments. In this fashion, the total number of sentence fragments to be completed could be reduced to 108, which is less than half the total in the present study. Another possibility to improve the task would include further simplification of the vocabulary. In the CEGEP sessions, for example, participants asked for the meaning of the word "rob", which was part of the filler sentences.

Secondly, the absence of a baseline or control group in this study limits the interpretability and the generalizability of the obtained findings. It should be noted that there was no true native speaker control or comparison group in this study, although the materials used in here were piloted with a large number of native English speakers. In other words, the final study materials were created based on the results of a large-scale

pilot test with native English speakers. However, these final study materials were not tested with another group of native speakers to determine if these amended and improved study materials would elicit the two target structures (PO and DO datives) to the degree that priming effects would be detectable with native speakers of English. Without these normative native speaker data, no strong conclusions based on the findings of this study are warranted.

Thirdly, the choice of dative alternation as the syntactic structure for this study is limiting. Specifically, the results of the present study support the observation that dative alternation is largely unknown to intermediate-level L2 learners. Thus, further research would logically limit participant proficiency level to advanced and above to study dative alternation as the structure for the priming measure.

At the outset, dative alternation was appealing for two reasons: comparison with the original study (Pickering & Branigan, 1998) was made easier and the DO construction is absent from French, which thus limits cross-linguistic transfer effects from learners' L1. In retrospect, however, the choice of dative alternation as the syntactic structure proved to have several disadvantages. Namely, the verb families that can be used to form either PO or DO utterances can also be used to form phrasal verbs. This was evident from some of the Other responses in the pilot test, for example "The pitcher threw up" and "The girl gave up". In fact, before the "problematic" verbs in the measure were replaced in an effort to reduce Other completions, some were generating upwards of 75% Other responses. As discussed in Pickering and Ferreira (2008), language change may also account for why dative alternation is a disadvantage for a given participant population. It may be that dative alternation is used more frequently in Britain than in

North America, or that the use of DO construction was perhaps more prevalent in the population tested by Pickering and Branigan (1998).

Having said this, what alternate syntactic structures best lend themselves to syntactic priming research? So far, research has largely concentrated on dative alternation (e.g. Bock, 1986; Pickering & Branigan, 1998), passive/active (e.g. Hartsuiker et al., 2004), question development (McDonough & Mackey, 2008), and use of an optional complementizer (Ferreira, 2003). Factors to consider in the search for alternatives include those related to developmental stages (e.g., Pienemann et al., 1988), cross-linguistic influence (e.g., Odlin, 1989), and frequency (e.g., Ellis, 2002). For the requirements of a written sentence completion task, the structure would have to occur at the end of a sentence, which further limits the possibilities. Ideally, the structure would occur in the early developmental stages, not be subject to cross-linguistic influence (CLI), and be a high-frequency structure. This ideal combination would be difficult to attain. Take, for instance, tag questions. They occur at the end of a sentence and are fairly impervious to CLI. However, the disadvantages of using tag questions in a syntactic priming task include lack of frequency, and their emergence in a relatively late developmental stage. Alternate structure possibilities therefore remain a question.

Another limitation of this study relates to the choice of participants. Although the study was designed to include at least two proficiency levels, the intermediate-level CEGEP participants did not show a measureable priming effect. Choices to offset the limitations of the present study in terms of participant selection lead in two possible directions. Were a future study to include three levels of learner proficiency (beginner, intermediate, and advanced), an extensive rework of the measure would be necessary

provided that all participants were to be tested using the same materials. Alternately, maintaining the measure as it is now would dictate an increase in the number of advanced participants in an attempt to create sufficient statistical power. Using participants at more than one proficiency level also has the advantage of lending possible support to a "cross-proficiency" priming effect. A disadvantage of using multiple proficiency levels lies in the fact that even within a given proficiency, there are vast individual learner differences. This was especially true of the CEGEP participant group.

In summary, because of the limitations discussed above, the results of the present study should be interpreted cautiously.

CHAPTER 6

IMPLICATIONS AND CONCLUSION

Chapter Overview

This chapter discusses pedagogical implications and applications of the findings of the present study and outlines some possible future directions of research on repetition in L2 learning.

Does Repetition Work?

This study attempted to establish the effects of repetition using syntactic priming as a methodological tool. The theoretical basis for the use of syntactic priming is well established and was discussed earlier in this thesis. The results of this study overall support (albeit modestly) the tenet that repetition "works" at the cognitive psycholinguistic level for L2 learners. Specifically, the results of this study suggest that a single use of a given syntactic structure, in this case DO datives, can enable learners to reuse (repeat) this structure again. Learners appear not to be aware of this subtle repetition effect, and there was no other explanation other than that of syntactic priming that could explain this phenomenon. Although the results of this study should be interpreted with caution, (see the Limitations section in Chapter Five), repetition does appear to be an implicit psycholinguistic phenomenon responsible, to some extent, for the findings of this study.

Pedagogical Uses of Priming

The present study was conceptualized as an investigation that could help bridge the gap between research and teaching, that is, between pedagogical emphasis on repetition in language teaching and cognitive psycholinguistic research on repetition (especially using the priming paradigm). After the results of this study have been discussed, it is reasonable to pose the following question: Can priming (if priming is indeed a form of implicit learning) be used pedagogically? As was discussed previously, the priming effect measured in the present study likely did not emerge as a result of learners' previous explicit instruction on the target construction (DO datives). One of the possible accounts of this finding, then, is that the learners who exhibited priming had previously learned the DO construction implicitly by way of repetition. This does not completely rule out the possibility that they learned it by previous instruction. Hence, implicit learning using priming as a learning mechanism could have potential for use in the classroom.

In fact, repetition as a form of priming is always at work whenever language is used. Consider, for example, a listening comprehension activity from an advanced level grammar book (Maurer, 2006), in which learners first explore the passive in reading comprehension and written practice exercises. In these exercises, learners are expected to use passive structures in their written and spoken utterances, after being "primed" to do so through meaningful repetition of the target structure. This listening comprehension activity (an excerpt from which is shown below) illustrates these principles at work. This exercise is part of a larger section relating to communication practice. In this activity, the

students first listen to an audio dialogue and then answer questions about it in groups or in a whole class situation. In the dialogue, repetition of the passive voice is evident:

Sadler: Why weren't we notified immediately?
Akimura: Well, you've heard that the zoo is currently being expanded, haven't you? The expansion depends on a 50 percent *yes* vote in the election. The expansion proposal isn't likely to get approved by the voters if they hear that animals are missing.

After listening to this dialog, learners are expected to be able to respond to a series of listening comprehension questions followed by two possible statements, only one of which is correct. Five of the nine listening comprehension answers contain passive structures in both statements, which increases learners' exposure to the target structure. For example, the statements relevant to the excerpt above are the following: (a) The zoo expansion has been completed and (b) The zoo expansion has not been completed (Maurer, 2006, p. 232).

Another feature of this activity relevant here is that the interlocutors in this dialogue (Detective Sadler and Zoo Administrator Akimura) use syntactic structures in a way that speakers of English do. That is, both interlocutors align their use of syntactic structures in conversation. In this case, they both make use of the passive. This supports the argument put forward by Pickering and Garrod (2004) that interlocutors tend to reuse syntactic structures in conversation and that doing so facilitates interaction and serves as a social "lubricant".

If repetition is indeed central to language use, then there are potentially many uses of repetition in language teaching. Four potential areas of application of repetition for implicit learning in a language classroom will be highlighted here. These areas include

(1) the use of corrective recasts for providing learners with feedback, (2) the use of repetition for negotiation of meaning and creating social cohesion, (3) the use of repetition in context to promote fluency, and (4) the use of activities, such as textual analysis, to help learners experience repetition. These four areas are discussed in turn.

Corrective Recasts

Long (2007) defines corrective recasts as those where a nontarget-like item in a learner utterance is replaced in the instructor's reformulation. This technique can be used for various types of nontarget-like learner utterances, including syntactic ones. In a study of the use of corrective recasts in the classroom, Han and Kim (2008, p. 35) illustrate the effect of corrective recast use for prepositions. In this example, the student (S) reformulates her use of preposition in response to the teacher's (T) corrective recast:

T:	Has anyone tried horsemeat? . . . XX [student's name], have you?
S:	No, I am not adventurous of food.
T:	I am not adventurous with food.
S:	Adventurous with?

Various studies (e.g., Doughty & Varela, 1998; Lyster, 1998) support the idea that for corrective feedbacks to be relatively efficient, they need to (a) serve either a corrective or communicative function but not both at once, (b) be carried out systematically, and (c) draw the learner's attention to the error. A corrective recast can be conceptualized as a prime in a typical prime-target syntactic priming sequence, and the learner's attempt at the correct utterance in response to the recast can be viewed as a target. Thus, corrective recasts (and syntactic priming as the implicit mechanism likely at

work as part of recasting) would feasibly fulfill the first two conditions above. Indeed, most recasts serve a corrective function and are used systematically by teachers.

If syntactic priming is indeed the mechanism underlying the corrective benefit of recasting, then instructors could decide to use corrective recasts to provide repetition for a given syntactic feature not just as an error correction tool but also as a general pedagogical technique. For example, instructors could use recasting as a tie-in to a grammar point in a textbook, and use corrective recasts systematically for as long as the learners are studying the particular feature. In this way, recasts not only would serve as corrective feedback techniques but would also act as implicit repetition "primes" encouraging learners to reuse a syntactic structure. If, for example, use of the passive was the topic and the learners were using the passive in a communicative group activity, the instructor could "eavesdrop" and offer corrective recasts to benefit and advance implicit learning.

Repetition for Negotiation of Meaning

Another example of the use of meaningful repetition in the language classroom to support social communication can be found in Duff (2000). Drawing on a corpus of discourse collected from a total of four classroom-based studies conducted in foreign language settings (Duff, 1995, 1996; Duff & Polio, 1990; Polio & Duff, 1994), Duff posits that the benefits of repetition in classroom interaction align with both the learners' psycholinguistic and sociocultural needs.

The first study (Duff, 2000), which included the data obtained in an EFL immersion classroom in a Hungarian high school, sought to answer the question regarding the roles, characteristics, and effects of repetition in a class where EFL was

used in a history context. For example, Duff observed that the teacher used the words *cold, snow* and *prisoners* in a whole-class discussion on the subject of Siberia. When the class broke into smaller groups, the students reused the same words in their reporting to the class, thus possibly fulfilling a psycholinguistic need. Duff also observed that the students repeated the use of humour previously used by the teacher, thus using repetition to fulfill a sociocultural need.

The second pair of studies (Duff & Polio, 1990; Polio & Duff, 1994) focused on students at the undergraduate university level in the USA, with beginner-level learners of German and Hebrew. In the German class, for example, the teacher used frequent repetition of various conjugated forms of the German verb *anziehen* (to dress) in interaction with a learner to focus on the correct syntactic form. In this setting, Duff observed that repetition was used foremost to negotiate meaning, thus fulfilling a psycholinguistic function. Duff also observed less "sociocultural" repetition, leading her to believe that proficiency and repetition are in some way connected. She hypothesized that high proficiency learners would use repetition for sociocultural purposes more than low proficiency learners would. Taken together, these studies led Duff to call for a re-examination of meaningful repetition in the classroom, in light of both the psycholinguistic and social benefits it affords foreign language learners.

Although the first of the two above examples addresses lexical repetition, the basic idea put forth in Duff (2000) relates to the benefits of repetition in classroom interaction. The observation that teacher-led interaction very often contains repetition could apply specifically to the learning of syntactic forms. A teacher could choose to focus on a given syntactic feature taken from a lesson plan, and then prime students to

use that structure by using it as frequently as possible in classroom interaction.

Subsequently, group discussions could be monitored by the teacher so that the teacher

could ensure that the syntactic structure is used repeatedly during group interaction.

Repetition to Promote Fluency

The use of repetition as priming for implicit learning in a language classroom

appears to be most appropriate within those teaching approaches that emphasize the use

of meaningful repetition in teaching. One example of such a teaching approach is termed

ACCESS (Gatbonton & Segalowitz, 2005). The acronym stands for Automatization in

Communicative Contexts of Essential Speech Segments. This method was developed as a

response to the need for the promotion of automatic fluency (ability to speak accurately,

effortlessly, and efficiently, without undue pauses and hesitations) in a communicative

language teaching (CLT) approach. The need for the method arose from a tendency on

the part of teachers to resort to drilling in an effort to promote automatic fluency, even

within a CLT approach.

ACCESS consists of three phases and various tasks related to each phase. Each

class period ideally completes a three-phase cycle. The object of the method is to enable

the language learner to become fluent, with respect to a particular set of speech segments,

after the completion of a cycle. The main task of the creative automatization phase (Phase

1), where learners participate in an activity designed to encourage them to use

"functionally useful utterances" (Gatbonton & Segalowitz, 2005, p. 329), specifically

makes use of repetition to attain the automatic fluency goal. The authors use the example

of learners creating a class picture. Without using gestures, learners must request that

their classmates take various positions in the classroom, so that a group picture can be taken. In order to complete this task, the learners must repeatedly use target utterances, such as "Move to the right, please", "Back up some more", or "Stand behind Avi". All of these utterances feature the imperative construction. Other possible tasks designed to explore formulaic utterances of a given syntactic form include those related to the recounting of personal events, where the simple past is often used, as well as surveys of current events in newspapers, where the passive voice occurs frequently.

If syntactic priming is indeed the mechanism that is at work in repetition, then learners (in completing ACCESS activities) are relying on syntactic priming not only to become more fluent but also to learn the structures they are using. Thus, repetition in the form of priming could serve to encourage automatic fluency and L2 grammar development. These interesting claims, beyond a doubt, need to be explored in future research.

Repetition through Textual Analysis

Yet another alternative for the use of repetition as a form of implicit learning can be found in activities that allow learners to explore authentic texts. Such activities, promoted, for example, by Thornbury (2006), include having learners look for occurrences and analyze repetitions of a given grammatical structure in authentic texts. For example, to target the use of passive structures for advanced ESL learners, a possible activity could be a textual analysis of the National Apology to the Stolen Generations speech (http://www.pm.gov.au/media/speech/2008/speech_0073.cfm). This speech, given by the Australian Prime Minister in February 2008, serves as a sample of authentic text which interweaves the use of both the passive and active voice.

The activities related to textual analysis would take place over the course of more than one class period, and could feasibly make up a Webquest, among other things. The learners could form groups which would each address one part of the speech and begin by highlighting the verb structure in each sentence. Subsequently, they could distinguish between the verb structures using the passive voice and those using the active voice, and link both uses to a specific context.

To explore a meaning-focused dimension while integrating repetition of the target structure into another type of related activity, learners could explore the use of passive versus active contexts in the text. For example, they could answer the question of whether the passive is used to describe events of the past, and supply possible reasons why this is the case. A wrap-up activity could take the form of group reporting the results of the research in the meaning-focused activity. In this fashion, learners' exposure to reports from different groups could serve to magnify the effect of repetition of the target structure throughout the lesson.

Future Directions

The present study is the first of its kind in terms of sample size ($n = 138$) and target population (French native speakers). Future directions for this type of study would benefit from expanding the target population to include beginner-level learners. This would require further adaptation of the task, which could feasibly result in the design of either a cloze sentence completion or even a multiple-choice measure.

Another aspect of the findings of this study, one that also warrants further exploration, is the inverse preference effect. The effect described by Pickering and

Ferreira (2008) and Ferreira and Bock (2006) may offer new insights into syntactic priming, but more research must be done in order to observe this phenomenon at work within the scope of syntactic priming, using L2 learners as the target population.

Future applications of syntactic priming to L2 teaching need to be informed by both experimental and classroom-based descriptive studies. Such studies could, for example, focus on the question of precisely how many repetitions of a given syntactic structure are sufficient to produce a measureable syntactic priming effect and to result in learning. Future studies of corrective recasts may wish to focus exclusively on interactive recasts using repetition, as was the case in the studies conducted by Duff (1995, 1996), Duff and Polio (1990) and Polio and Duff (1994). Approaches such as ACCESS also offer promising classroom research possibilities into the use of repetition as syntactic priming. By testing the ACCESS methodology in a rigorous, perhaps longitudinal, investigation with appropriate post-tests and delayed post-tests, it would be possible to understand further how priming promotes the development of L2 accuracy and fluency.

Closing Remarks

This study contributes (albeit modestly) to our understanding of how the effect of repetition becomes measurable as syntactic priming for L2 learners. It also offers support for implicit learning, and clarifies how L2 learners can benefit from such learning through hearing or seeing target syntactic features on a very frequent basis. Finally, after many years of schism between repetition and communicative language teaching (CLT), it is hoped that dialogue can be renewed and that the advantages of repetition in the

language learning classroom are recognized, to the benefit of L2 learners and CLT

proponents alike.

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Appendix A

Sample English Grammar Test Items

Instructions: **Circle** the underlined item that is **incorrect**.

1. At a <u>critic</u> point in the final match, the quarterback <u>summoned</u> his strength and <u>threw</u> <u>the receiver the ball</u>.
2. Orchids <u>come</u> in a <u>wide variety</u> of <u>colourful,</u> shapes, and <u>scents</u>.
3. Maya <u>decide</u> to take <u>obedience</u> <u>courses</u> with her puppy Jazz, so that she can make him bring the ball <u>to her</u>.
4. Before European <u>settlers</u> arrived and began <u>to exterminate</u> grizzlies, 50,000 to 100,000 of <u>the bears</u> may have <u>exist</u> south of Canada.
5. When Amanda is <u>to</u> tired to do homework, she <u>frequently</u> asks her mother to write <u>her teacher</u> a note.
6. <u>Rabies</u> is a <u>serious</u> disease <u>carried</u> in the saliva of <u>an infected</u> animals.
7. After Bob <u>finally sold</u> the house <u>from his ex-wife</u>, he decided to return <u>to</u> the place where he grew up.
8. The calibre of a gun is the diameter of <u>his</u> bore, usually <u>expressed</u> in <u>hundredths</u> of <u>an</u> inch.
9. The CEO has <u>decided</u> to send all <u>company employees a memo,</u> <u>for</u> the recent rumours <u>regarding</u> a possible closure.
10. <u>Following</u> volcanic activity in Martinique in 1902, a <u>huge</u> number of six-foot fer-de-lance <u>snake</u> left the mountains and <u>slithered</u> into the city of Pierre.
11. <u>To make</u> a lithograph, an artist <u>used</u> a flat stone of <u>a kind</u> that will <u>soak up</u> oil and water.
12. The Dupont children <u>loved</u> to visit their <u>Aunt</u> Alice because <u>she always</u> giving <u>chocolate to them</u>.
13. Acidic lava flows <u>ready</u> and tends to cover <u>much larger</u> areas, while <u>basic</u> lava is <u>thicker</u>.
14. Recent <u>development</u> in medicine, especially in the pharmaceutical <u>field</u>, will enable doctors to promise <u>their patients</u> shorter recovery <u>times</u>.
15. Sounds <u>can travel</u> <u>through</u> water, <u>wood</u>, glass, and <u>others</u> materials.
16. <u>When opened</u> in 1918, the Philips Collection <u>in</u> Washington, D.C., was the first museum in the United States to offer <u>modern</u> art <u>at the American people</u>.
17. All of <u>an</u> anteater's long tongue <u>are</u> covered with a <u>sticky</u> salivary <u>secretion</u>.
18. We <u>won</u> a Washington Capitals baseball <u>cap,</u> but we had to <u>mail to</u> the entry form to a company located <u>in</u> Toronto.
19. Lyne <u>sent</u> over 50 postcards <u>of her friends</u> and <u>relatives</u> during her recent trip <u>to</u> France.
20. <u>Each</u> kernel of popcorn contains a small <u>amount</u> of water, which <u>turned</u> to steam when the kernel is <u>heated</u>.
21. <u>During</u> their training, future <u>flights</u> attendants <u>learn</u> the finer points of <u>serving</u> <u>passengers</u> wine and liquor.

22. <u>Acoustical</u> <u>engineer</u> is concerned with <u>the</u> <u>technical</u> control of sound.
23. Special education teachers <u>study</u> to find <u>ways</u> of teaching <u>pupils</u> with learning disabilities <u>to reading</u>.
24. <u>Navigational</u> <u>position</u> is <u>frequently</u> expressed <u>on</u> latitude and longitude.
25. During last week's <u>inquest</u>, the coroner <u>asked</u> the witness why he <u>waited</u> so long to give the <u>police some statement</u>.
26. In the 1450s, German <u>craftsman</u> Johannes Gutenberg <u>introduced</u> the <u>printed</u> press <u>into</u> Europe.
27. Franklin <u>forgot</u> <u>to tight</u> the wrist strap on his Wii controller and almost <u>hit</u> the TV screen when he tossed <u>his team mate the ball</u>.
28. Born in Texas in 1890, Katherine Anne Porter produced three <u>collection</u> of short <u>stories</u> before <u>selling</u> her well-known novel Ship of Fools <u>to a publisher</u> in New York.

Instructions: **Circle** the underlined item that is **incorrect**.

1. ___, the author of Little Women, began writing stories before she was 10 years old.
   a. Louisa May Alcott
   b. For Louisa May Alcott
   c. When Louisa May Alcott
   d. Louisa May Alcott was the
2. The Mayflower was bound for Virginia, but a hurricane ___ off course.
   a. blew it
   b. to blow it
   c. it blew
   d. blowing it
3. William Henry Harrison, ___ of pneumonia shortly after being inaugurated, served only 31 days as president of the United States.
   a. died
   b. he dies
   c. who died
   d. the death
4. Seismic reflection profiling has ___ the ocean floor is underlain by a thin layer of nearly transparent sediments.
   a. reveal that
   b. revealed that
   c. the revelation of
   d. revealed about
5. People who were born at very high altitudes often have larger chests and lungs ___ who live at sea level.
   a. those do
   b. than do

      c. do those

      d. than do those

6. ___ , the faster its molecules move.

      a. A liquid gets hotter

      b. To get a liquid hotter

      c. For a liquid to get hotter

      d. The hotter a liquid gets

7. All fossil fuels, whether ___ , liquid, or gas, are the result of organic material being covered by successive layers of sediment over the course of millions of years.

      a. solid

      b. are solid

      c. they are solidly

      d. solids are

Answer Key

Question Number	Answer
1	A
2	A
3	B
4	D
5	A
6	B
7	D
8	B
9	A
10	D
11	C
12	C
13	C
14	D
15	B
16	D
17	C
18	D
19	D
20	D
21	A
22	D
23	A
24	B
25	C
26	C
26	B
28	B
29	A
30	C
31	C
32	A
33	B
34	D
35	D

Appendix B

Language Background Questionnaire

Questionnaire d'expérience en anglais   Code du participant: _____

1. Nom : _____

2. Date de naissance : ___ / ___ / ___   3. Lieu de naissance : _____

4. Sexe :   M   F   5. Numéro de téléphone : _____

6. Adresse électronique : _____

7. Quelle est votre langue maternelle ? _____

8. Avez-vous été exposé à cette langue depuis la naissance ?   Oui ___ Non ___

9. Quelle est votre langue seconde ?_____

10. À quel âge avez-vous commencé à apprendre votre langue seconde ? _____

11. Quelle langue parlez-vous à la maison ? _____

12. Dans quelle langue avez-vous étudié à l'école ? Encerclez la langue appropriée.

    a. Primaire :   Français seulement   Anglais seulement   Autre : _____

    b. Secondaire : Français seulement   Anglais seulement   Autre : _____

    c. Cégep :   Français seulement   Anglais seulement   Autre : _____

13. Décrivez votre apprentissage de l'anglais :

    a. Nombre d'années : _____   b. Nombre d'heures par semaine : _____

    c. Environnement (école, maison, travail) : _____

Veuillez évaluer votre habileté à parler, écouter, lire et écrire en **français**. Utilisez les chiffres de 1 à 9 dans les cases ici-bas. Veuillez noter que 1 = très faible et 9 = excellente.

Parler	Écouter	Lire	Écrire
1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9

Veuillez évaluer votre habileté à parler, écouter, lire et écrire en **anglais**. Utiliser les chiffres de 1 à 9 dans les cases ici-bas. Veuillez noter que 1 = très faible et 9 = excellente.

Parler	Écouter	Lire	Écrire
1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9	1 2 3 4 5 6 7 8 9

S.V.P. indiquez le pourcentage de temps approximatif où vous utilisez les langues suivantes par jour. Veuillez encercler le pourcentage approprié pour chaque habileté.

Français										
Parler	0%	10	20	30	40	50	60	70	80	90	100%
Écouter	0%	10	20	30	40	50	60	70	80	90	100%
Lire	0%	10	20	30	40	50	60	70	80	90	100%
Écrire	0%	10	20	30	40	50	60	70	80	90	100%
Anglais										
Parler	0%	10	20	30	40	50	60	70	80	90	100%
Écouter	0%	10	20	30	40	50	60	70	80	90	100%
Lire	0%	10	20	30	40	50	60	70	80	90	100%
Écrire	0%	10	20	30	40	50	60	70	80	90	100%

Appendix C

List of Prime and Target Sentence Fragments

Booklet A. PO-inducing/DO-inducing. Same verb. Same tense.

1. The little boy showed the torn shirt.../showed the kind babysitter...
2. The patient showed...
3. The efficient secretary gave the long fax.../gave the grumpy businessman...
4. The little girl gave...
5. The teacher read the story.../ read the kindergarten class...
6. The lawyer read...
7. The millionaire offered the priceless painting.../ offered the art museum...
8. The bank manager offered...
9. The journalist sent the detailed report.../ sent the magazine publisher...
10. The man sent...
11. The mother gave the expensive toy.../ gave the crying baby...
12. The flight attendant gave...
13. The ticket clerk sent the concert ticket.../ sent the happy fan...
14. The kidnappers sent...
15. The fashion designer offered the pink jacket.../ offered the magazine editor...
16. The firefighter offered...
17. The older child showed the colourful book.../ showed the young friend....
18. The lawyer showed...
19. The grandmother threw the big present.../ threw the little girl...
20. The box office clerk threw...
21. The woman told her story.../ told the police officers...
22. The defendant told...
23. The store manager sold the blue dress.../sold the tall customer...
24. The car salesperson sold...
25. The frustrated employee sent the complaint letter.../ sent the managing director...
26. The famous author sent...
27. The architect gave the building plans.../ gave the eager engineer...
28. The teacher gave....
29. The photographer showed the incriminating photos.../ showed the unethical journalist...
30. The lonely soldier showed...
31. The youngster showed the stuffed toy.../ showed the kind teacher...
32. The police officer showed...
33. The host offered the dessert.../ offered the guests...
34. The chef offered...
35. The older sister handed the potatoes.../ handed her brother...
36. The nurse handed...
37. The secretary sent the invoice.../ sent the manager...

38. The boyfriend sent...
39. The lifeguard showed the life jacket.../ showed the swimmer...
40. The inventor showed...
41. The coach threw the basketball.../ threw the player...
42. The soccer player threw...
43. The driving instructor gave the certificate.../ gave the learner...
44. The manager gave...
45. The waiter offered the appetizers.../ gave the customer...
46. The grandmother offered...
47. The woman sent the claim.../ sent the insurance company...
48. The sports fan sent...
49. The lecturer passed the book.../ passed the professor...
50. The storeowner passed...
51. The babysitter read the story.../ read the small child...
52. The judge read...
53. The photographer sent the pictures.../ sent the editor...
54. The florist sent...
55. The baseball player showed the bat.../ showed the coach...
56. The car mechanic showed...
57. The student read the letter.../ read her friend...
58. The teenage girl read...
59. The bank manager handed the cheque.../ handed the customer...
60. The medical intern handed...
61. The dentist showed the x-rays.../ showed the patient...
62. The hairdresser showed...
63. The spy sent the secret documents.../ sent the double agent...
64. The insurance company employee sent...

Booklet B. PO-inducing/DO-inducing. Same verb. Different aspect.

1. The little boy showed the torn shirt.../showed the kind babysitter...
2. The patient is showing...
3. The efficient secretary gave the long fax.../gave the grumpy businessman...
4. The little girl is giving...
5. The teacher read the story.../ read the kindergarten class...
6. The lawyer is reading...
7. The millionaire offered the priceless painting.../ offered the art museum...
8. The bank manager is offering...
9. The journalist sent the detailed report.../ sent the magazine publisher...
10. The man is sending...
11. The mother gave the expensive toy.../ gave the crying baby...
12. The flight attendant is giving...
13. The ticket clerk sent the concert ticket.../ sent the happy fan...
14. The kidnappers are sending...
15. The fashion designer offered the pink jacket.../ offered the magazine editor...

16. The firefighter is offering...
17. The older child showed the colourful book.../ showed the young friend....
18. The lawyer is showing...
19. The grandmother passed the big present.../ passed the little girl...
20. The box office clerk is passing...
21. The woman told her story.../ told the police officers...
22. The defendant is telling...
23. The store manager sold the blue dress.../sold the tall customer...
24. The car salesperson is selling...
25. The frustrated employee sent the complaint letter.../ sent the managing director...
26. The famous author is sending...
27. The architect gave the building plans.../ gave the eager engineer...
28. The teacher is giving....
29. The photographer showed the incriminating photos.../ showed the unethical journalist...
30. The lonely soldier is showing...
31. The youngster showed the stuffed toy.../ showed the kind teacher...
32. The police officer is showing...
33. The host offered the dessert.../ offered the guests...
34. The chef is offering...
35. The older sister passed the potatoes.../ passed her brother...
36. The nurse is passing...
37. The secretary sent the invoice.../ sent the manager...
38. The boyfriend is sending...
39. The lifeguard showed the life jacket.../ showed the swimmer...
40. The inventor is showing...
41. The coach threw the basketball.../ threw the player...
42. The soccer player is throwing...
43. The driving instructor gave the certificate.../ gave the learner...
44. The manager is giving...
45. The waiter offered the appetizers.../ gave the customer...
46. The grandmother is offering...
47. The woman sent the claim.../ sent the insurance company...
48. The sports fan is sending...
49. The lecturer passed the book.../ passed the professor...
50. The storeowner is passing...
51. The babysitter read the story.../ read the small child...
52. The judge is reading...
53. The photographer sent the pictures.../ sent the editor...
54. The florist is sending...
55. The baseball player showed the bat.../ showed the coach...
56. The car mechanic is showing...
57. The student read the letter.../ read her friend...
58. The teenage girl is reading...
59. The bank manager handed the cheque.../ handed the customer...
60. The medical intern is handing...

61. The dentist showed the x-rays.../ showed the patient...
62. The hairdresser is showing...
63. The spy sent the secret documents.../ sent the double agent...
64. The insurance company employee is sending...

Booklet C. PO-inducing/DO-inducing. Different verb. Same tense.

1. The little boy showed the torn shirt.../showed the kind babysitter...
2. The patient gave...
3. The efficient secretary gave the long fax.../gave the grumpy businessman...
4. The little girl showed...
5. The teacher sent the storybook.../ sent the kindergarten class...
6. The lawyer handed...
7. The millionaire offered the priceless painting.../ offered the art museum...
8. The bank manager offered...
9. The journalist sent the detailed report.../ sent the magazine publisher...
10. The man mailed...
11. The mother gave the expensive toy.../ gave the crying baby...
12. The flight attendant showed...
13. The ticket clerk mailed the concert ticket.../ mailed the happy fan...
14. The kidnappers sent...
15. The fashion designer offered the pink jacket.../ offered the magazine editor...
16. The firefighter offered...
17. The older child showed the colourful book.../ showed the young friend....
18. The lawyer gave...
19. The grandmother threw the little girl.../ threw the ball...
20. The goalie gave ...
21. The politician wrote a letter.../ her husband...
22. The college student showed...
23. The store manager sold the blue dress.../sold the tall customer...
24. The car salesperson offered...
25. The frustrated employee sent the complaint letter.../ sent the managing director...
26. The famous author mailed...
27. The architect gave the building plans.../ gave the eager engineer...
28. The teacher showed....
29. The photographer mailed the incriminating photos.../ mailed the unethical journalist...
30. The lonely soldier sent...
31. The youngster showed the stuffed toy.../ showed the kind teacher...
32. The police officer gave...
33. The host offered the dessert.../ offered the guests...
34. The chef passed...
35. The older sister passed the potatoes.../ passed her brother...
36. The nurse offered...
37. The secretary sent the invoice.../ sent the manager...

38. The boyfriend mailed...
39. The lifeguard showed the life jacket.../ showed the swimmer...
40. The inventor gave...
41. The aid worker passed the bag of food.../ passed the refugee...
42. The hockey player gave...
43. The driving instructor gave the certificate.../ gave the learner...
44. The manager sold...
45. The waiter offered the appetizers.../ gave the customer...
46. The grandmother passed...
47. The woman sent the claim.../ sent the insurance company...
48. The sports fan mailed...
49. The lecturer passed the book.../ passed the professor...
50. The storeowner sold...
51. The babysitter read the story.../ read the small child...
52. The judge told...
53. The photographer sent the pictures.../ sent the editor...
54. The florist mailed...
55. The baseball player showed the bat.../ showed the coach...
56. The car mechanic gave...
57. The student read the letter.../ read her friend...
58. The teenage girl told...
59. The bank manager passed the cheque.../ passed the customer...
60. The medical intern offered...
61. The bank manager passed the cheque.../ passed the customer...
62. The hairdresser gave...
63. The spy sent the secret documents.../ sent the double agent...
64. The insurance company employee mailed...