The Role of Recurrent Multi-Word Utterances in the Acquisition of Past Tense
Morphology by Adult ESL Learners

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ABSTRACT

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Frequency effects are powerful mechanisms of human cognition and learning, including language acquisition. The study explores the possible contribution of frequency effects on the acquisition of the simple past in English. The focus of the study was the distribution of simple past in recurrent multi-word utterances (RMUs) in both native speaker and second language learner speech. The objective was to determine whether there is an association between RMUs and the semantic categories of verbs in NS speech, and if so, whether this association would in turn predict the accuracy rate of simple past in L2 speech. The prediction, informed by the Aspect Hypothesis, was the association between RMUs and telic predicates, and, hence, their greater accuracy in L2 speech. The study examined the distributional frequency of semantic categories of verbs in descriptions of past weekend produced by 29 native speakers and 33 ESL learners, as well as the accuracy of past morphological markers for the learners. The findings suggest that telics are significantly more predominant in L1 RMUs than in non-RMUs. Telics also prevail in L2 speech, and they received most accurate markings in all past multi-word utterances produced by learners. As to the prediction of more accurate morphological markers for telic predicates in RMUs versus those in non-RMUs, only advanced proficiency learners showed significant advantage of RMUs. The findings are interpreted in relation to the research in formulaic sequences and the AH. The issues of verb type frequency and L2 proficiency need to be further investigated. Pedagogical implications for instruction are suggested in conclusions.

Acknowledgements

Dedication

To my dear parents,

whose love and support cannot be counted

"Not everything that counts can be counted,

and not everything that can be counted counts".

a sign in Albert Einstein's office at Princeton University

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Chapter 1: Introduction

This chapter provides an overview of the study by presenting its general rationale and the issues which will be explored. It also briefly describes the design of the study and the expected findings.

Research in Corpus Linguistics has brought to our attention the widespread phenomenon of recurrent multi-word utterances, also known as formulas, existing in natural language. For example, Altenberg (1998), based on his analysis of the London-Lund Corpus of 435,000 words, found over 201,000 recurrent word-combinations representing about 68,000 types with disparate length and frequency. The researcher estimated that up to 80% of words could appear in various recurrent word-combinations. Some examples of recurrent combinations with *I see* are *oh I see; I see; yes I see; [m] I see; oh yes I see; I see OK; ah I see; I see right.* Moon (1998) investigated the 18,000,000 words Oxford Hector Pilot Corpus and found 6,776 fixed expressions and idioms as, for example, *every cloud has a silver lining; you can't have your cake and eat it; over the moon; red herring; a ballpark figure/estimate; as we know it* (see also Ellis, Simpson-Vlach, & Maynard, 2008; Howarth, 1998; Wray, 2002). Obviously, the estimates of multi-word lexical items by different researchers vary according to the disparate definitions and taxonomies of these lexical units that they use (see Wray, 2002, for a detailed overview). Considering the pervasiveness of formulas in mature adult speech, scholars (Gatbonton & Segalowitz, 1995; Lewis, 1996, 1997; Nattinger & DeCarrico, 1992; Pawley & Syder, 1983; Weinert, 1995; Willis, 1990; Wray, 2002) have speculated that they may play a role in the acquisition of general language proficiency.

This speculation is supported by a number of researchers who have argued in favor of a frequency-based explanation of acquisition (see, for instance, Bley-Vroman & Yoshinaga, 2000; Bybee, 2002; N. Ellis, 2002a, 2002b; R. Ellis, 2002).

The present study investigates a special set of formulas and their possible role in promoting the acquisition of English past verbs by adult ESL learners. The particular formulas focused upon are recurrent and routinizable multi-word utterances (henceforth RMUs) that Gatbonton, Segalowitz, Trofimovich, & Zhang (2007) reported to have found abundant in native speakers' oral description of their weekends. Gatbonton et al. defined RMUs as utterances that are at least three words long, and that are frequently produced in more or less fixed forms not just by the same speaker but also by other speakers describing the same topic. Examples of these RMUs are full utterances such as *I watched television*, and utterance frames with replaceable slots, such as *I went to the (movies/ grocery store)*. The criteria used in designating multi-word utterances as recurrent or non-recurrent and the details of Gatbonton et al.'s study are presented below. The RMUs focused upon here are those that are used in describing common past activities (what people did, where they went, what they saw, ate, bought, talked about) done in the context of the weekend. Gatbonton et al. (2007) listed the verbs that are used in these RMUs and found them to be among the most commonly used verbs in English (Longman, 1999). These RMUs will be examined in terms of their possible association with certain semantic categories of verbs (achievements, accomplishments, activities, states). The hypothetical association may facilitate the acquisition of English simple past morphology.

The Aspect Hypothesis (henceforth AH) proposed by Andersen and Shirai (1994) and Bardovi-Harlig (2000) makes a number of predictions concerning the acquisition of the tense-aspect system by second language learners, one of which is relevant for the purposes of this study. It concerns the spread of the simple past morphological markings in second language learners' interlanguage from the most prototypical semantic categories of achievement and accomplishment verbs (telics) to activities and then states. Beginner-level learners are more likely to be influenced by prototypical semantic categories while using tense-aspect markers whereas the impact of prototypical accounts decreases gradually with the increase of learners' proficiency level. There is robust empirical research in second language acquisition that lends support to this prediction (see, for example, Bardovi-Harlig (2000) for an overview of studies with different L2, and Shirai (2004) for ESL).

There are many possible explanations for the patterns observed in the studies of the AH. The present study is especially concerned with the accounts connecting the findings of AH studies with the frequency of the distribution of the prototypical semantic forms in input (Collins, 2005, 2007; Collins, Trofimovich, White, Cardoso, & Horst, 2009; Shirai & Andersen, 1995) and with item-based learning (Shirai, 2004; Sugaya & Shirai, 2009), since the RMUs which are the object of this study are both input-frequent and formulaic.

Considering the role of frequency in interpreting the AH, it seems reasonable to suppose that input-frequent multi-word formulaic sequences and their effects on the acquisition of the past tense morphology are worthy of further investigation. If we

assume that high input frequency facilitates learning of tense-aspect morphological markings, then, perhaps, certain semantic categories are initially learned faster than others because they are contained in utterances that are frequently used and heard. For instance, achievement and accomplishment (henceforth, telic) verbs may be first marked for the simple past because most of the common RMUs contain a large number of those verbs. It might be that RMUs are the driving force behind learning the past tense with telics, considering that telics are significantly more prevalent in RMUs than in non-RMUs. The present study aims to find out whether this is indeed the case. For this reason, the study investigates the distributional frequency of semantic categories of verbs in native speakers' RMUs found to abound in common everyday functional speech situations such as describing past weekends.

The study involves two stages. First, the RMUs and the non-RMUs, used by the group of native speakers talking about their weekend and examined by Gatbonton et al. (2007), were analyzed. The objective was to determine the distributional frequency of semantic categories of verbs in the RMUs and in the non-RMUs. The analysis of the frequency of occurrence for states, activities, and telics in the RMUs and in the non-RMUs allowed predictions about possible relationships between RMUs and the prevalence of one or more of the lexical categories of the verbs they contained. Second, the speech of a group of ESL learners of different proficiency levels was examined to see how accurately they used simple past morphological markings in obligatory contexts in the RMUs or in the non-RMUs. Finally, an examination was made of whether accuracy is significantly higher for some semantic verb categories than for others.

The present study aims to contribute to the field of second language acquisition by answering the question of whether there is an association between the use of formulaic sequences and the semantic categories of the verbs they contain. If such an association exists, then teaching RMUs may facilitate the acquisition of English past tense morphology by creating appropriate exposure to certain semantic categories of verbs in various and meaningful contexts (Collins, 2007).

The thesis is organized in the following way. Chapter 2 provides a review of relevant literature and states research questions and predictions. Chapter 3 describes the methodology of the study and the procedures for the data coding and analyses. Chapter 4 outlines statistical tests used to analyze the data and the results of the analyses. Chapter 5 discusses the results of the study in relation to research questions and predictions. Finally, Chapter 6 summarizes the findings, considers limitations of the study and indicates directions for future research. It also suggests some pedagogical implications of the findings for second language acquisition.

Chapter 2: Review of Theoretical and Empirical Research

The chapter consists of three main parts. The first part presents the review of background literature on formulaic sequences in second language acquisition and defines recurrent multi-word utterances, the object of the present study. The second part reviews theoretical aspects of the past tense morphology acquisition by L2 learners. The third part presents the rationale for the study and advances research questions and predictions.

Formulaic Sequences in SLA: Definition and Functions

Definition of a Formulaic Sequence

A starting point for the discussion is the widely applied definition of multi-word lexical items formulated by Wray (2000) (see, for example, Schmitt, Grandage, & Adolphs, 2004; Underwood, Schmitt, & Galpin, 2004; Schmitt & Underwood, 2004). Wray defined a *formulaic sequence* as "a sequence, continuous or discontinuous, of words or other meaning elements, which is, or appears to be, prefabricated: that is, stored and retrieved whole from memory at the time of use, rather than being subject to generation or analysis by the language grammar"(p.465).

Numerous researchers (e.g.: Ellis, Simpson-Vlach, & Maynard, 2008; Erman & Warren, 2000; Pawley & Syder, 1983; Sinclair, 1991; Wray, 2002) have noted the pervasiveness of formulaic sequences in mature adult speech. Many of them have further theorized that because formulas are abundant in natural speech, their learning or mastery would benefit second language learning (Lewis, 1996; Nattinger and De Carrico, 1992; Pawley and Syder, 1983; Weinert, 1995; Willis, 1990; Wray, 2000). Some of the

traditionally assumed benefits of including formulas in SL instruction include the communicative advantage, the fluency advantage, the processing advantage, and the systemic change advantage (Gatbonton et al., 2007). The theoretical reasons underlying each of these perceived advantages will now be considered in detail.

Functions of Formulaic Sequences

A communicative advantage for the use of formulaic sequences is proposed by those who believe that the mastery of formulas can help establish or facilitate communication at the initial language learning stages (Weinert, 1995; Wray, 2000). In early communication, formulas enable beginner learners to attract quality input from proficient language speakers. Some empirical research on this issue has shown that employing rote-learned chunks is an efficient communicative strategy for both children (Tabors & Snow, 1994; Wong-Fillmore, 1976) and adults (Schmidt, 1983).

A fluency advantage is advanced by those who see that the proceduralization of formulas make speech appear more fluent (Gatbonton & Segalowitz, 2005; Pawley & Syder, 1983; Weinert, 1995; Wood, 2001, 2006; Wray, 2002). Formulaic sequences are important for fluency because they can be stored and then retrieved from memory as wholes, thus saving time and effort in on-line language production. The empirical studies by Towell et al. (1996), Ezjenberg (2000), Wood (2006), and Boers et al. (2006) have established a strong link between the use of formulaic language and the development of speech fluency. The first three studies measured participants' production fluency with temporal variables. Their findings suggest that fluent speakers have higher mean length of run (MLR) between pauses (Towell et al., 1996; Ezjenberg, 2000; Wood, 2006) and

greater speech rate (Ezjenberg, 2000). The researchers reached similar conclusions: that the increase in MLR is due to the growth of the number of formulas per run ratio from the beginning till the end of the experiment. In the same line, Boers et al.'s (2006) pedagogically-oriented study reported the positive impact of the use of formulaic sequences on the evaluation of students' fluency as one of the components of general oral proficiency.

A processing advantage is suggested by those who believe that mastery of formulas reduce processing burden, because formulas are processed by the human brain in a special way. Wray (2000, 2002), Wray et al. (2004), and Van Lancker Sidtis (2004) have presented a theoretical basis in support of the dual systems processing model which is also empirically testable (see, for example, Ullman, 1999). The model proposes the simultaneous existence of analytic mechanisms for language processing responsible for comprehension and production of the novel language, and holistic mechanisms which deal with prefabricated, holistic units to reduce processing effort and "to fast-track both production and comprehension in predictable situations" (Wray et al., 2004, pp. 67-68). The holistic system functions by default. When it fails to yield satisfactory results, the analytic system is applied to process meaning. The researchers argue that such an approach accounts for creativity and formulaicity in language.

Psycholinguistically-oriented research on formulaic language processing provides contradictory results on whether formulas facilitate comprehension for both first and second adult language users; the issue needs further investigation. Schmitt, Grandage, and Adolphs (2004) examined 34 native and 45 non-native English speakers'

performance on an oral dictation test with 25 clusters of various lengths taken from corpora and embedded into the text. The researchers reported that the native speaker participants scored significantly better on the cluster production than non-native participants. Also, the high-proficiency learners were the most accurate and close to the native-like performance, whereas the low-level proficiency participants employed the biggest number of incorrect clusters or omitted them altogether. These findings are consistent with the idea that formulas should be learned by SL learners to increase automaticity, which, in turn, will ensure their efficient retrieval and processing (Gatbonton & Segalowitz, 2005; Wood, 2001). In the same line, Underwood, Schmitt, and Galpin (2004) employed the eye-movement measuring instruments to gain insight into the processing of formulas by educated L1 and L2 English speakers. The researchers concluded that there are processing advantages for terminal words forming part of a formulaic sequence. Conversely, Schmitt and Underwood (2004) found no processing advantages for the terminal words in formulaic sequences for either native or non-native speakers performing the self-paced reading task. The results of the study also showed that non-native speakers process non-formulaic language better than unknown formulas. These findings are consistent with those of Van Lancker Sidtis (2004), Schmitt et al. (2004), and Underwood et al. (2004), and provide additional evidence of the difficulties of formulaic language processing for second language learners.

Finally, the systemic change advantage is seen by those who believe that formulas can help learners improve their knowledge of the language grammar by increasing their understanding of systemic relationships that exist in the language (Gatbonton et al., 2007). Examples of systemic relationships include spatial relationships, i.e., the position

of objects in space (*over, under, on top of*), temporal relationships, which denote actions over time (*before, after, watch-watched*), and causal relationships, which denote the action's effects on others (*push, eat, break*).

Systemic change can happen in two ways. First of all, chunks which are acquired early by learners may be broken down into smaller parts that feed into creative construction. Empirical investigations of child first language (Cameron-Faulkner et al., 2003; Tomasello, 2000) and second language (Wong-Fillmore, 1976; see also Weinert, 1995 for a review) acquisition provide some evidence that early acquired chunks serve as slots for further creative use of language. For instance, Tomasello (2000) argued that L1 acquisition starts with holophrases which are followed by item-based structures with one or several slots called utterance schemas.

In second language acquisition, Wong-Fillmore (1976) was the first to claim that her participant analyzed formulaic sequences and used them productively to create novel utterances. Similar results were obtained by Myles, Mitchell, and Hooper (1999) who conducted a longitudinal analysis of the usage and developmental stages of French interrogative chunks produced by 16 British adolescents. The formulaic L2 utterances were differentiated according to several criteria, including almost word-for-word reproduction, phonological coherence, grammatically and syntactically complex structures, and context predictability. The participants were recorded six times during various individual, pair, or group oral production tasks, such as a Talk-about-Photos task using the researcher's family photos as prompts, a story retelling task, a one-way information gap task, a planning an outing task with partially completed diaries, etc., all

aimed to elicit spontaneous and creative language going beyond in-class memorized dialogues. Myles et al. concluded that formulaic utterances serve as the basis for creative use of language. The learners who memorized formulaic chunks at early learning stages and then subsequently unpacked them and used them creatively were the ones who reached the more advanced levels on the developmental scale of interrogative questions (Pienemann, Johnston, & Brindley, 1988). In contrast, those learners who did not employ formulas lagged behind and were unable to produce new sentences on their own.

The second way in which chunks can contribute to systemic change is by serving as material for learners' to induce grammar rules. Acquiring numerous identically-structured chunks in appropriate contexts allows learners to see their common features and extract rules which can later be used productively to form novel utterances (Gatbonton & Segalowitz, 2005; Gatbonton et al., 2007; Weinert, 1995). The theoretical underpinnings of this belief are found in usage-based accounts of language acquisition. For example, N. Ellis (2002) claims that learning grammar is equal to the piecemeal learning of a great number of constructions. The regularities are subsequently inferred based on frequency counts.

The empirical research to investigate the use of formulas in order to extract grammar rules is rather scarce. Bolander (1989) studied 60 adults with Polish, Finnish and Spanish L1 taking a four months intensive Swedish course. The researcher investigated the development of word order and negative placement in Swedish. Bolander reported that her participants used learned formulas to extract syntactic rules of subject-verb inversion in main clauses when adverb was in initial sentence position and correctly overextended

this rule to object-preposed main clauses. Moreover, the researcher noted that some errors in negative structures could also be traced to the drilled *auxiliary + verb* chunk. The researcher thus established the link between formulas, either instructed or just input-salient, and the induction of grammar rules (Weinert, 1995).

However, a number of researchers (Granger, 1998; Krashen & Scarcella, 1978; Wray, 2000, 2002; Yorio, 1989) do not support the idea that learning formulas contributes to systemic change. Wray (2000) argues against formulas promoting grammatical competence with adult learners, highlighting the fact that adults differ from children in the way they process formulas. While children induce grammar patterns from formulas as wholes, and seem to use them as the basis of their creative language (Wong-Fillmore, 1976), adults tend to break down formulas into its constituent parts in order to understand relationship among its elements. Wray further claims that formulas are inappropriate for grammatical analysis by adults due to their irregular form, and, consequently, formulaic sequences may cause learners to incorrectly induce grammar rules. In arguing against teaching formulas to improve production accuracy, however, Wray seems to use only specific types of fixed formulas like idioms and proverbs which very often do have irregular syntactic structure and are not readily breakable into constituent parts. The same claim does not necessarily hold true concerning other types of formulas like productive frames with open slots.

Recurrent Multi-Word Utterances: The Object of the Study

The pervasiveness of formulas in every day speech and the possible advantages to learning formulas as outlined above, have persuaded a number of practitioners (Lewis,

1996, 1997; Nattinger & DeCarrico, 1992; Pawley & Syder, 1983; Willis, 1990) to articulate their proposals on how to teach formulas. Gatbonton and Segalowitz (2005) also have proposed to teach formulas. Their proposal was motivated by the possibility that learning formulas might induce systemic change, in particular, that the learning of chunks may assist learners to extract grammar rules and common structures exemplified in these chunks. Gatbonton and Segalowitz suggest that the pedagogically useful formulas they have in mind must have certain characteristics. They must be associated with language functions that speakers deal with in their day to day interactions: apologizing, requesting, giving complements, describing routines and narrating past events. Such formulas should also contain verbs, prepositions, and other elements that show different kinds of relationships (e.g., temporal relationships, spatial relationships, and causal relationships, to mention a few). In terms of teaching, the researchers maintain that such formulas should be taught as chunks or as wholes and learned to automaticity in generally communicative contexts, as was proposed in the *Automatization in Communicative Contexts of Essential Speech Segments (ACCESS)* methodology (Gatbonton & Segalowitz, 2005). The underlying assumption of ACCESS is that formulas which are learned to automaticity in genuine communicative contexts will ensure learners' exposure and further noticing of basic relationships in a language system. Therefore, it will lead learners to know parts of the system and, subsequently, to figure out how the relationships work within this system.

Although Gatbonton and her colleagues (Gatbonton & Segalowitz, 2005; Gatbonton et al., 2007) proposed specific formulas as being useful to teach, they are aware that these formulas have only been hinted at but are not found in the taxonomies of

formulas examined elsewhere (e.g., Howarth, 1998; Moon, 1998; Wray, 2002). They therefore conducted research in order to confirm the existence of teachable formulas of this kind in English native speech and then see whether and how L2 learners acquire them. The participants of the research included two participant groups, one group of 29 adult native speakers of North-American English and one group of adult English learners with Chinese L1. The researchers decided to gather the data using the "describe a weekend" activity since they thought it would allow them to elicit utterances that were functional, recurrent, and containing structural relationships (doing something, going somewhere, doing something to something or someone, etc.). The data elicitation tasks were identical for the group of native speakers and the group of Chinese English learners. The tasks included oral interviews in which participants were asked to describe in detail their past weekend, the Alibi game role playing task and a picture description task. All tasks were audio recorded.

The data analysis included several stages. The data from each participant group was analyzed separately but followed similar procedures. First, each set of data was separately transcribed by two or three paid transcribers and subsequently verified by another one. The data of the Chinese English learners were coded for errors by a native speaker of English and then subsequently verified by another one, both being experienced ESL teachers. Second, each set of data was entered into a concordancing program (CONC 1.80b3 for Macintosh), which rearranges each word in the participants' output in alphabetical order. The word is shown with several other words which immediately precede or follow it, so that utterances with similar structures and forms can be easily identified. Third, multi-word utterances containing verbs were identified. These

utterances were the subject of further in-depth analysis. Recurrent combinations of three or more words were noted, as well as the number of speakers who produced them. The combinations that were produced verbatim by two or more different speakers were classified as Recurrent Multi-Word Utterances (RMUs). The three-word verb-centered combinations that were produced by only one speaker were considered as non-RMUs.

To summarize, Gatbonton et al.'s (2007) preliminary work on the data showed that there was a total of 3,511 past verb-oriented propositions in a 44,484 word corpus. Of these, 301 RMU types (1,594 tokens) were used by native speakers to narrate past events. The Chinese learners of English produced a 38,252 word corpus with 157 types of RMUs, out of which 104 types were the same as the ones used by native speakers, whereas 53 types were L2 speaker constructions.

The present study was designed to investigate the role of RMUs and non-RMUs, as defined by Gatbonton et al. (2007), in the acquisition of the English verb system, specifically past tense morphology, by instructed ESL adult learners. It is hypothesized that the verb, as the central element of grammar, is more likely to manifest systemic changes. The question addressed here is the following: If second language learners are exposed to formulas which contain certain semantic categories of verbs, will it help them to learn those categories faster and perhaps improve their knowledge of the other categories as well, that is, the verb system in general? The next section will consider the theoretical issues of the acquisition of tense-aspect morphology.

The Aspect Hypothesis and Its Influence on the Development of the Past Tense Morphology in English Learners' Interlanguage

According to their inherent lexical meanings, predicates can be classified into *achievements, accomplishments, activities,* and *states* (Vendler, 1967). These semantic categories are determined by whether they have *telic, punctual* or *dynamic* features (Comrie, 1976). *Telic* describes an event that has an inherent endpoint; *punctual* describes an event perceived as occurring instantaneously, and *dynamic* describes an event that needs the application of energy. The following table, reproduced from Shirai and Andersen (1995, p. 744), shows the different verb categories and their semantic characteristics:

Table 1

Feature Analysis of the Four Verb Classes

	State	Activity	Accomplishment	Achievement
Punctual	-	-	-	+
Telic	-	-	+	+
Dynamic	-	+	+	+

States are predicates denoting actions with duration (-punctual), without any inherent endpoint (-telic) and without requiring special effort or energy for their realization (-dynamic). Examples are *love, hate, smell, taste. Activity* predicates are dynamic (+dynamic), have duration (-punctual) but no clearly defined endpoints (-telic), for instance, *sing, run, study. Accomplishment* predicates are also dynamic (+dynamic), have duration (-punctual) and definite and obvious endpoints (+telic); for example, *go to a*

metro station, take a shower, walk one kilometer. Achievement predicates are dynamic (+dynamic), they denote instantaneous actions (+punctual) that can be reduced to a single point in time, and have an inherent endpoint (+telic); for instance, *start, discover, break.*

The AH (Andersen & Shirai, 1994; Bardovi-Harlig, 2000) accounts for the tendencies observed in the acquisition of tense-aspect morphology. The underlying assumption of the AH is that speakers closely associate certain morphological markings of grammatical aspect more with certain categories of verbs because these markings are more congruent with the inherent meanings of these verb categories. According to the AH, speakers are likely to choose the simple past to mark achievement predicates, such as *reach a finish line, break a record* than the present or progressive markers, or any other grammatical markers. This may be because the simple past is more suggestive of actions that have clear endpoints and duration, which achievement predicates are, according to their inherent lexical meaning. On the other hand, progressives, which denote actions that are ongoing and in progress, are more closely associated with verb activities that are durative, telic, and dynamic (Andersen & Shirai, 1994; Bardovi-Harlig, 1998, 2000; Collins, 2005; Shirai, 2002). Andersen and Shirai (1994) claim that this tendency to associate past perfective grammatical markers with accomplishments and achievements and progressive markers with activity predicates seem to be true for both mature speakers and learners. It should be noted that the recent tendency in the AH research is not to differentiate between accomplishment and achievement predicates, but rather consider them as one category of telic verbs (Andersen & Shirai, 1996; Bardovi-Harlig, 1999; Collins, 2002). Andersen & Shirai (1994) maintain that the choice of grammatical morphemes is motivated by a number of universal cognitive operating

principles, such as choosing the grammatical marker that has the greatest relevance (the Relevance Principle, Bybee, 1985; Slobin, 1985) and the highest congruence (the Congruence Principle, Andersen, 1993) to the aspectual meaning of the verb, as well as being guided by initial belief that each morpheme has only one meaning and function (the One to One Principle, Andersen, 1984). Equally important to the understanding of the AH is the cognitive notion of prototypicality (Shirai & Andersen, 1995), which presumes a strong initial association between the most prototypical meaning of an inflection and the most representative verbs of each semantic category, that is the best or prototypical exemplars of the category. For instance, Shirai & Andersen (1995), based on their research, maintain that the past inflections in English would be first attributed to the prototypical verbs with resultant-state meaning and telic and punctual characteristics (See also Andersen & Shirai (1994) for a full explanation of the role of cognitive principles in explaining the AH).

In terms of second language acquisition, the AH predicts the following. Because of the tendency to pair aspectual morphemes with the lexical meaning of the verbs, learners, in the early learning stages attach past tense morphemes to achievement verbs (e.g., He *finished* his dinner), and accomplishment verbs (e.g., I *talked* with my mother). Only later do they associate these morphemes with activity verbs (e.g., The man *watched* TV), and, finally, to stative verbs (e.g., He *wanted* to go to the university). According to the AH (Andersen & Shirai, 1994), beginner-level learners do so because they are influenced by prototypical semantic categories, whereas the impact of prototypical accounts decreases gradually with increase of their proficiency level.

The wide range of empirical research provided support to the predictions of the AH for the acquisition of L2 English (Bardovi-Harlig, 1998; Bardovi-Harlig & Reynolds, 1995; Collins, 2002, 2004, 2005, 2007; Housen, 2002; Rocca, 2002) and other second languages (Salaberry & Shirai, 2002), such as French (Bardovi-Harlig & Bergström, 1996; Izquerdo & Collins, 2008), Japanese (Shirai & Kurono, 1998; Sugaya & Shirai, 2007, 2009), and Spanish (Andersen, 1991; Hasbún, 1995). To illustrate, Bardovi-Harlig & Reynolds' (1995) study investigated the test performance of 182 adult ESL learners with disparate L1 and at six different proficiency levels varying from beginner to advanced. Sixty-two tested verbs from semantic categories of achievements, accomplishments, activities and states, as well as 26 distractor verbs were embedded into 32 short passages which indicated the proper context for the simple past either through time adverbials or verb tense. The findings of the study suggest that achievement and accomplishment verbs are the ones that receive the largest number of past inflections at all proficiency levels, whereas activity and state verbs receive significantly smaller number of past inflections, with progressive tense being the competitor for the simple past with activities, and non-past for the statives. Similarly, Collins (2002) reported two cross-sectional studies which were modified replications of Bardovi-Harlig & Reynolds' (1995) study. Collins' Study 1 included 70 Francophone ESL adult learners who supplied the verb forms for 32-passage rational cloze task from Bardovi-Harlig & Reynolds (1995). Study 2 comprised 91 participants of the same Francophone adult population performing modified cloze task from Study 1 and a preference task. The results revealed that the participants in both studies correctly chose the simple past with telics (achievements and accomplishments), but failed to do so with states in obligatory past

contexts. In general, the findings of the studies supported the prediction of the Aspect Hypothesis.

Different explanations are possible for the observed predictions of the AH, in addition to the presumed operations of the cognitive principles and the prototypical account described briefly above. Bickerton (1981) suggests that the ability to make state-process and punctual-non-punctual distinctions is part of one's innate bioprogramming (Language Bioprogram Hypothesis). Other researchers, like Andersen and Shirai (1994) and Collins (2005), claim that input frequencies are significant to understanding the AH.

The Distributional Bias Hypothesis by Andersen and Shirai (1994) suggests that in their speech, adult native speakers show a quantitatively significant tendency to use a particular morpheme with a particular semantic category of verbs, as it is predicted by the AH. The native speakers make such associations, most probably, under the constraints of communicative pressure. When language learners are exposed to this unequal distribution of forms, they misinterpret the situation, deciding that each form has its own function and that this function is unique. Therefore, learners at initial stages of language learning restrict the use of each form to the most prototypical semantic categories of verbs, and only later realize that those forms can be used with other semantic categories of verbs as well.

Shirai and Andersen (1995) found support for their hypothesis when they examined the longitudinal data of three children acquiring the English L1 tense-aspect system. They found that, initially, the children attached simple past morphological markings almost exclusively to achievement verbs, and progressive markings

predominantly to activity verbs. At later acquisitional stages the past and progressive morphological markings were extended to non-prototypical semantic categories of verbs. Most importantly, they found a significant association between the frequency of past markings and achievement verb pairings and progressive markings and activity verb pairings in the speech of mothers directed to their children. Based on this finding, the researchers suggest that the distributional bias in caregivers' speech creates the prototypes for the acquisition of tense-aspect morphology by children.

Some empirical evidence about the relationship between input frequencies and second language learners' past tense morphological markings is also presented by Collins (2005). She examined English simple past tense markings by 21 Mandarin Chinese and 22 Japanese L1 ESL adult learners. The data were elicited with the help of the written cloze task converted into a computerized timed judgment task. The participants were shown passages where they had to supply a correct verb form out of the three choices available to them on the screen. Fifty-six tested verbs were in simple past contexts. The results of the study were consistent with the predictions of the AH, as the participants of the study supplied the largest number of correct simple past forms for telic verbs, and the smallest number of those forms for stative verbs. Moreover, when the participants were interviewed to gain insights into the reasons that led the learners to mark grammatical aspect in a particular way, Collins found two main factors: the semantic categories of verbs, and the frequency with which they encountered verbs in the simple past in the instructional input. For example, the learners were aware of statives as a separate semantic category, but claimed that in their experience, stative verbs were almost never used in the past either in the classroom or in their textbooks. Another frequency factor

that influenced students' answers was their continuous exposure to certain pedagogical rules. For instance, "the 3rd person singular takes an *s* rule" (p. 214) made some learners choose simple present every time the participant of the sentence was a third person noun or pronoun, since they had learned that this was the context for the marked form in English. From her findings, the researcher concluded that the frequency factor was important, and that in future research on second language tense-aspect acquisition as well as pedagogical practices, frequency should be considered.

Taking another line of thought, Shirai (2004) reviewed 15 single-level, cross-sectional and longitudinal studies dealing with the acquisition of aspect in ESL. Shirai observed that the studies which used discrete point paper-and-pencil elicitation procedures conformed to the predictions of the AH. On the other hand, the studies which used oral or written production data registered, contrary to the predicted pattern, the increase of the reliance on prototypical accounts in marking grammatical aspect as the proficiency level grew. Shirai explains this counter-evidence in terms of lower-level learners' greater reliance on rote-learned formulas, as those forms are frequently used and more easily accessed under the constraints of communicative pressure; that is why the lower-level learners' production is less influenced by prototypical form-meaning associations. In contrast, higher-level learners have more cognitive resources to pay attention to form-meaning mappings in the input, and their production shows stronger form-meaning prototypical associations, as predicted by the AH. Thus, Shirai proposes that rote-learned formulas play a role in second language acquisition.

This interpretation was largely supported by Sugaya and Shirai's (2009) empirical findings. Sugaya and Shirai analyzed the performance of 61 Japanese L2 adult learners on acceptability judgment test which included simple nonpast (*-ru*), simple past (*-ta*), nonpast imperfective (*-te i -ru*) and past imperfective (*-te i -ta*) verb forms. The participants were divided into Higher (advanced learners) and Lower (intermediate learners) proficiency groups based on the results of the Oral Proficiency Interviews. The results of the study showed that the advanced learners had high accuracy scores and productive control of the target forms. On the other hand, the intermediate learners showed preference for using four achievement verbs in the nonpast imperfective tense, which is contrary to the predictions of the AH. The researchers then consulted a 5 million word corpus by Japanese native speakers and found out that learners' preference to use achievement verbs either in past or non-past forms reflects the frequency with which Japanese L1 speakers use either one or the other form. Thus, Sugaya and Shirai maintain that item-based learning has a role to play in SL tense-aspect morphological markings, as the input frequency may not only explain associations between the morphological forms and semantic verb classes, but also associations between individual verbs and morphological markings. Sugaya and Shirai further argue that morphological markings develop according to the sequence from formulaic forms at the elementary level to low scope patterns at the intermediate level, and then, finally, to productive constructions at the advanced learning level, as proposed by N. Ellis (2002).

Wulff, Ellis, Römer, Bardovi-Harlig and Leblanc (2009) made a step further to explain the acquisition patterns of tense-aspect morphology by examining isolated verbs in input rather than general lexical categories. The researchers explored the contribution

of such factors as frequency distributions, strength of form-function associations and prototypicality of lexical aspect to the order with which aspectual markers are acquired. Study I examined the type and token frequency of verbs in two native speaker corpora, 10,000,000 words BNC (spoken) and 1,700,000 words MICASE, and oral interviews of 37 beginning L2 learners from Bardovi-Harlig study (1998, 2000). For the native speaker corpora, the distribution of 100 most frequent verbs conformed to Zipf's law (Zipf, 1935), that is, the higher the frequency of each verb, the bigger number of tokens it has in the input with a certain TA morpheme. Because some of ten most frequent verb types occur repeatedly with more than one TA morpheme, it seems that frequency distribution cannot be the only explanation of the acquisition patterns. The researchers then applied Multiple distinctive collexeme analysis (MDCA, Gries & Stefanowitch, 2004) to test the strength of association between each verb and TA morpheme. Similarly to the distribution of raw frequency tokens, the distribution of associations is also Zipfian, that is the small number of verbs is highly associated with a given TA morpheme, and the strength of association decreases for the less frequent verbs. Overall, the results of the study indicated moderate correlation between distribution frequency and form-function mapping. Finally, Study II explored to what extent individual verbs are associated with prototypical lexical aspect. This was done in the following way. Twenty native speakers were asked to provide telicity ratings for 86 verbs chosen from Study I on the scale from 1 to 7. The participants had a high agreement on which verbs were stronger associated with telicity than the others. Wulff et al. concluded that all three factors explored in the study are positively correlated and they make a combined contribution to the acquisition of tense-aspect morphology.

Similarly, Collins et al. (2009) maintain that type rather than token frequency is determinant in language acquisition. The researchers conducted a multidimensional analysis of three different constructions: the perfective simple past, the progressive aspect, and the possessive determiners *his/her* as they were presented in a 110,000-word corpus of aural instructional input. The objective was to determine what factors make those constructions easy or difficult to acquire for second language learners. The findings revealed that frequency effects played an important role in acquisition profiles of those constructions, but that frequency alone could not account for everything. It is the combination of type frequency, semantic scope of words used in constructions and perceptual salience that together contributed to the ease of their acquisition.

To summarize, the empirical research on the AH asserts that English simple past morphological markings are associated first with achievement and accomplishment semantic categories of verbs (usually considered as one category of telics), and only later with activity and state verbs. The explanations for why the findings that support the hypothesis seem to be so robust are various: what may be involved are cognitive operating principles, or the prototypical account (Andersen & Shirai, 1994), innate bioprogramming (Bickerton, 1981), and/or input frequency (Distributional Bias Hypothesis by Andersen & Shirai (1994); Collins, 2005; Collins et al., 2009; Wulff et al., 2009). Additionally, some researchers (Shirai, 2004; Sugaya & Shirai, 2009) have straightforwardly claimed that input-frequent rote-learned formulas also have their role to play in SL tense-aspect acquisition.

The Study

Based on the claims about the role of frequency and the essence of the distributional bias hypothesis (Collins et al., 2009; Andersen & Shirai, 1994), there is reason to believe that formulaic sequences, which by nature occur frequently almost verbatim in the speech of both native speakers and L2 learners may impact the L2 acquisition of past tense morphology, and, therefore, be worthy of further investigation. This study examines the distributional frequency of semantic categories of verbs inside L1 RMUs, as well as non-RMUs, an analysis which, to the best of my knowledge, has not previously been carried out. The reviewed literature indicates that it might give us some clues to the understanding of the observed patterns that support the AH. It might be that RMUs describing past events contain a significant number of telic verbs and that this is why these verbs are the first to receive past morphological markings by L2 learners. Non-RMUs may not have the same prevalence of telic verbs, since, by definition, these utterances are infrequent in natural language. The study also aims to answer the question of whether the distributional frequency of the semantic categories of verbs in L1 RMUs influences the accuracy of simple past morphological markings in oral production by L2 learners.

There are two parts to this investigation. The first looks at the native speakers' speech where a large number of RMUs were identified. The aim is to determine what semantic categories of verbs are most closely associated with RMUs, as well as non-RMUs. The second investigates how these particular categories are acquired by L2 learners.

The independent variables of the study are RMUs and non-RMUs produced by native speakers and second language learners. The dependent variables are semantic categories of verbs and L1 RMUs and semantic categories of verbs and L1 non-RMUs, as well as the accuracy of past morphological markings produced by L2 participants.

The moderator variable to consider is the participants' English proficiency.

Research Questions and Predictions

The research questions are as follows:

1) Is there a semantic category of verbs (telics, activities, states) that predominates in the past utterances that native speakers of English used in describing their weekend?

2) Does the same semantic category of verbs predominate in utterances that are considered to be:

    a) RMUs;

    b) non-RMUs?

3) Do the semantic categories of verbs associated with L2 RMUs have significantly more accurate past tense morphological markings than the same semantic verb categories produced in L2 non-RMUs?

4) To what degree are the patterns observed in the third research question affected by English L2 proficiency levels?

Based on the literature on the AH and the formulaic sequences discussed above, I advance the following predictions:

1. There will be a predominance of telic verbs in native speakers' description of their past weekend.

2. RMUs will contain more telic verbs than non-RMUs.

3. The past tense morphological markings will be more accurate in RMUs.

4a. The beginner and intermediate-level learners will be more accurate while marking simple past for the predominant semantic categories of verbs inside RMUs versus those inside non-RMUs.

4b. The accuracy of the advanced learners will not be affected by utterance types (RMUs or non-RMUs).

Chapter 3: Methodology

This chapter will report the methodology of the study by providing detailed descriptions of participants, data collection and data coding. It will also outline the procedure for data analysis.

Participants

The recorded speech of two groups of participants in Gatbonton et al.'s (2007) study was re-examined and used as data in the present study. One group was that of the native speakers of English (The Native Speaker Group). It comprised 29 male and female educated speakers of North American English, whose ages ranged from 18 to 54 years old, a mean of 25 years.

The second group of participants was the Student Group which included 33 learners of English with Chinese L1. Their ages ranged from 25 to 40 years old, with a mean of 30 years. The participants recruited for the study were taking one of the three undergraduate courses in English academic writing for English non-native speakers in a Canadian university at the time of the study.

Data Collection

As has already been mentioned, the present study used the data of the Native Speaker Group and the Student Group that had been collected and transcribed for the project by Gatbonton et al. (2007). The Native Speaker Group and The Student Group data were gathered according to a similar procedure. The participants of each group met in pairs with a research assistant in their homes or at the university. One participant

completed a biographical questionnaire, while the other was interviewed by the research assistant about his or her past weekend activities. Later, they switched roles. The participants were asked to talk intensively about their weekends by research assistants who were instructed to make sure that the interviewees described as many details of their activities as possible from when they woke up to when they went to bed during both days of the weekend. The interviewers were also cautioned not to suggest any activity to the ESL students but to let them give as many as they wanted. They could use lead questions but avoiding as much as possible suggesting any past tense verbs: *uh hmmm, what next? And then what? Go on... What about early in the morning? What about food?*, et cetera. After the interview, the pairs of participants were asked to work together to create an alibi which would protect them from accusations in a crime. They had to account for the whole day spent together out of town, so they could not be suspected to be at the scene of the crime. The participants were told they had unlimited resources to make-up their day. Thus, the alibi game was designed to elicit the descriptions of imaginary past weekend activities. All the interviews and alibi games were audio recorded.

The summary of the collected data is as following. The 29 Native Speaker Group participants produced a corpus of 44,484 words found in 6,589 verb-centered propositions (clauses or sentences that express a single main idea or thought (e.g., *I might do a bit of work*; *and sat down*). In 2,675 of these propositions the main verbs were past tense verbs; 2,447 of these were utterances that were at least three words long (e.g., *we went to the video store*). The Student Group produced a corpus of 38,252 words found in 4,576 verb-centered propositions, of which 2,984 contained past tense verbs. A total of 2,816 of these past tense utterances were at least three words long.

In applying the 2x2 criterion (two occurrences produced verbatim by two different speakers or twice by the same speaker) to determine whether the three or more word long past tense utterances produced by the Native Group were formulaic as described above, Gatbonton et al. (2007) identified 953 utterances in the native speaker data as non-RMUs (occurred only once in the corpus and spoken by one speaker) and 1,594 utterances as RMUs (two occurrences by the same or two plus speakers). The 1,594 utterances could be reduced to 301 utterances types (e.g., *I went home*; *we had to..*, and *had breakfast*) with a mean number of nine types each, (a range of 2 to 28 tokens, spoken by 1 to 16 speakers). Focusing on these 301 native speaker RMUs and finding out whether and how the Student Group produced them, the following results were obtained. As a whole, the Student participants had 1,217 utterances in which they attempted to use the native speaker RMUs. Removing multiple tokens (1-27) of each RMU in the speech of each participant, I calculated 876 types of RMU utterances. These 876 RMU and 1,599 non-RMU utterance types produced by the Student Group were used for further analysis in this study.

Data Coding

Data Transcription and Error Coding

The data were previously transcribed and error coded for Gatbonton et al.'s (2007) research project and the procedures of the transcription were reported in the literature review above. As a reminder, the Native Speaker Group and the Student Group data were separately transcribed by two or three paid transcribers and subsequently verified by another one. The data of the Student Group were coded for errors (Appendix

A) by a native speaker of English and then subsequently verified by another one, both being experienced ESL teachers who were doing their MA in Applied Linguistics at the time of the project. Then each set of data was entered into a concordancing program (CONC 1.80b3 for Macintosh).

The data analyzed in my study were all past verb utterances produced by both the Native Speaker Group and the Student Group.

Semantic coding

Two independent raters classified all verbs produced by both participant groups into semantic categories of achievements, accomplishments, activities and states (Shirai & Andersen, 1995). Both raters were MA students in Applied Linguistics program with the background knowledge of the AH research. The classification of verbs into semantic categories was done in the following way. Firstly, each verb was considered in the context of the utterance in which it was produced. All past verb utterances from Gatbonton et al.'s (2007) research project were already entered into a concordancing program so that the raters could see each verb in its immediate context, as, for example, *Ok, then we headed straight to the beach.* Secondly, each verb was stripped of the markings of grammatical aspect in order not to bias its lexical classification (Shirai & Andersen, 1995), such as *we head*[ ] *straight to the beach.* Any errors in the data of the Student Group were ignored at this stage. Thirdly, a verb, for instance, *head* [ ], was classified into appropriate category according to its lexical aspect. The classification was guided by a three-step operational test designed by Collins (2002; 2004; 2005; 2007)

based on her own research and on the operational tests used by other researchers in the field (see, for example, Shirai & Andersen, 1995; Shirai & Kurono, 1998).

Step 1: Dynamic Test. This test consists of a set of three tests to determine whether a verb is stative or dynamic. The tests are applied in a specific order. If the answer to the first test question is "yes", then the verb is dynamic, if the answer is "no", then the verb is stative. If the transcriber is not sure of the answer, he moves to the next question of the same set. The procedure is illustrated below.

Dynamic Test 1: Would it be appropriate (i.e., not unnatural) to ask: What did someone or something do? *I felt hungry. I talked to different people.*

Dynamic Test 2: Can you force/persuade someone to *X*?

They forced/persuaded me to feel hungry.

They forced/persuaded me to talk to different people.

Dynamic Test 3: When put in the simple present, does the situation represent a habitual, frequentative event? *I liked drinking coffee in the morning. *I called my friend after supper.*

Step 2: Telic Test. This test aims to identify activities. If the answer to the question is "yes", then the verb is atelic, i.e. activity. If the answer is "no", then the verb is telic, either accomplishment or achievement. The film test is used to decide which one is which.

The Film Test: Imagine that the situation has been filmed. Someone is in the middle of *Xing* (single action, not iterative or habitual). When you put the video on pause, can we say that the person *has Xed*?

He is watching TV.	[pause]	*Has he watched TV?*
I am cooking lunch.	[pause]	*Have I cooked lunch?*
He is signing a paper.	[pause]	Has he signed a paper?

Step Three: Punctual Test. This test aims to distinguish between two types of telic verbs: achievements, which are punctual, or accomplishments, which are durative. This test consists of two questions.

1. Is it possible to stop/finish *Xing* or to be no longer/still *Xing?*

If the answer is "yes", then the verb is accomplishment, "no" - achievement.

He stopped/finished cooking lunch/ signing a paper.

**He is no longer/still finishing his assignment.*

2. Is it odd to say that someone *has been Xing?*

If the answer is "yes", then the verb is achievement, "no" - accomplishment.

*He has been going out for a walk near my house. *It has been happening in July.*

Two raters first coded 1,599 L1 predicates and 2,543 L2 predicates individually. The initial inter-rater reliability was 76%. Then the raters met to discuss the discrepancies

in the semantic verb coding which resulted in 96.3% of agreement in coding L1 data and 95.64% for L2 data.

Multi-Word Utterances Coding

To categorize the utterances into RMUs and non-RMUs I used Gatbonton et al.'s criteria (2007). First, for each three-word utterance that had a past verb I counted the number of speakers who produced this utterance verbatim and the number of times the utterance was produced. Next, all three-word utterances produced verbatim by at least two different speakers, as well as those three-word utterances produced verbatim at least twice by the same speaker were classified as RMUs. If a three-word utterance was produced by only one speaker, then it was classified as a non-RMU. Finally, those RMUs or non-RMUs which contained modal verbs, past progressive and past perfect were excluded from the subsequent analysis because of the focus of the present study on the acquisition of the simple past morphological markings. An example of the data rearranged by a concordancing program for the purposes of this coding is presented in Appendix B. The multi-word utterances coding was first done by me, and then verified by Elizabeth Gatbonton. Any discrepancies were subsequently discussed and resolved.

Type and Token Frequencies

Because RMUs by definition have more tokens than non-RMUs, in comparing these two types of utterances I decided to look only at types rather than tokens. Thus, an RMU such as *We went to bed* was counted as one type regardless of whether it was produced by two or more speakers and used multiple times. In this manner, I made an

RMU more comparable to a non-RMU, (e.g., *I read in bed*) which by definition was a type with only one token.

The Student Group Proficiency Coding

To divide the participants into different proficiency levels, all utterances produced by each participant in describing his or her past weekend, whether or not these contained present, past, and future verbs, were examined. The counts were made of how many of these were produced correctly. The construction was considered correct if it was error-free, that is, if there were no errors in any part of the construction. The decision to look at correct constructions rather than correct morphological markings was aimed to avoid circularity in the data analysis. It should be noted, however, that this approach has a potential pitfall of disfavoring more advanced learners who normally produce more utterances which may result in a bigger number of errors. To illustrate, an utterance such as *I ate breakfast* was considered correct, but an utterance such as *I ate the breakfast*, though it contained a correct predicate was still considered an error because of the incorrect use of a determiner before the noun *breakfast*. Once the total number of correct constructions was obtained, it was then divided by overall number of utterances by each student and multiplied that number by 100 to receive an accuracy percentage. Based on their accuracy scores, the participants were assigned to three proficiency groups: low, intermediate and advanced, as it is presented in Table 2 below which shows the range of correct constructions and the number of participants in each proficiency group. The cut-off point for each proficiency level was arbitrary, but there was no overlap in the accuracy scores of the three groups. The percentage ranges of the accuracy scores were

14% within the Low, 15% within the Intermediate, and 16% within the Advanced Proficiency Groups.

Table 2

Division of the Student Group into Three Proficiency Levels

Proficiency Level	Percentage of correct constructions	Number of Students
Low	16-30%	12
Intermediate	31-46%	12
Advanced	47-63%	8

The data of one participant from the Student Group were excluded from further analysis at this point because they contained extremely small number of utterances, which contrasted with data from other participants.

Data Analysis Procedure

Table 3 below summarizes the procedure followed in the analysis of the data of the Student Speaker Group and those of the Native Speaker Group. The distributional frequency of past tense morphological markings for each L1 and L2 participant, as well as the accuracy of past tense morphological markings for each L2 participant derived through the procedure summarized in Table 3 were used in the different sets of statistical tests reported in the Analysis and Results chapter which follows.

Table 3

Procedure for the Analysis of Native Speaker Group and Student Speaker Group Data Sets

Stages	Steps/ Description
Stage 1: Classification of verbs inside all utterances into semantic categories.	Step 1: Consider a verb in context. Step 2: Strip a verb of the grammatical markings (ignore errors for the Student Group). Step 3: Use a series of operational tests by Collins (2002) to decide on the semantic category of a verb.
Stage 2: Categorization of all utterances into RMUs and non-RMUs	Categorize all utterances into RMUs and non-RMUs following the criteria by Gatbonton et al. (2007)
Stage 3: Frequency counts	Step 1: Count the number of each semantic category of verbs inside RMUs and then inside non-RMUs Step 2: Differentiate between type and token frequencies Step 3: Calculate the percentages of accurate simple past morphological markings (Student Group only)
Stage 4: Student group proficiency level coding	Step 1: Calculate the percentage of correct constructions over the total number of constructions for each participant Step 2: Assign participants to proficiency groups
Stage 5: Statistical analysis	Step 1: Use statistical procedures to test the association between RMUs and each semantic category of verbs, and then between non-RMUs and each semantic category of verbs Step 2 (Student Group data only): Use statistical procedures to test whether some semantic categories of verbs are marked more accurately than the others in RMUs, and then inside non-RMUs across the participants of different language proficiency levels

Chapter 4: Analysis and Results

This chapter describes the statistical procedures used to analyze the data and the results obtained from the study. The data for this study was analyzed in two sets of three way ANOVAs, with repeated measures design, using SPSS 12 software for Macintosh. The first ANOVA focused on the frequency distribution of the semantic categories in RMUs and non-RMUs in the speech of both the Native Speaker Group and the Student Group. The results of this first set of ANOVA are relevant for answering Research Questions 1 and 2. The second ANOVA repeated measures design was conducted on the data of the Student Group alone, this time focusing on the accuracy with which this group produced morphological markings with the semantic verb categories in RMUs and non-RMUs in the descriptions of their past weekend. The findings of this second ANOVA had relevance in answering Research Questions 3 and 4.

Frequency Distribution of Semantic Verb Categories in RMUs and Non-RMUs

Research Question #1: Is there a semantic category of verbs (telics, activities, states) that predominates in all the past utterances that native speakers of English used in describing their weekend?

In order to answer this question, a three-way analysis of variance (ANOVA) with repeated measures design was conducted on the Native Speaker Group data and the Student Group data. The within-subject variables were two levels of Sentence Types (RMUs and non-RMUs) and three levels of Semantic Categories (Telics, Activities, States). The between-subjects variable, Group, had two levels: Native Speaker Group and Student Group.

The analysis yielded a significant main effect of Sentence Type, F (1, 60) = 61.41, $p < .01$, $\eta_p^2 = .506$; and a significant main effect of Semantic Category, F (1, 60) = 225.01, $p < .01$, $\eta_p^2 = .789$, but there was no significant main effect of Group, F (1, 60) = 1.84, $p < .18$, ns. There were three significant interaction effects: Sentence Type x Group interaction, F (1, 60) = 69.87, $p < .01$, $\eta_p^2 = .538$; Sentence Type x Semantic Category interaction, F (1, 60) = 15.95, $p < .05$, $\eta_p^2 = .21$; and a Group x Sentence Type x Semantic Category interaction, F (1, 60) = 16.45, $p < .01$, $\eta_p^2 = .215$.

To find out what semantic category predominated in these data, a post-hoc analysis of the significant two-way interaction between Group x Semantic Category was conducted. Figure 1 below shows the distribution of the different semantic categories in the speech of the Native Speaker Group (Figure 1a) and the Student Group (Figure 1b).

	Telics	Acts	Stats
L1	21.224	6.138	10.155

	Telics	Acts	Stats
L2	24.667	9.348	9.848

Figure 1a. Distribution of semantic categories of verbs for the Native Speaker Group
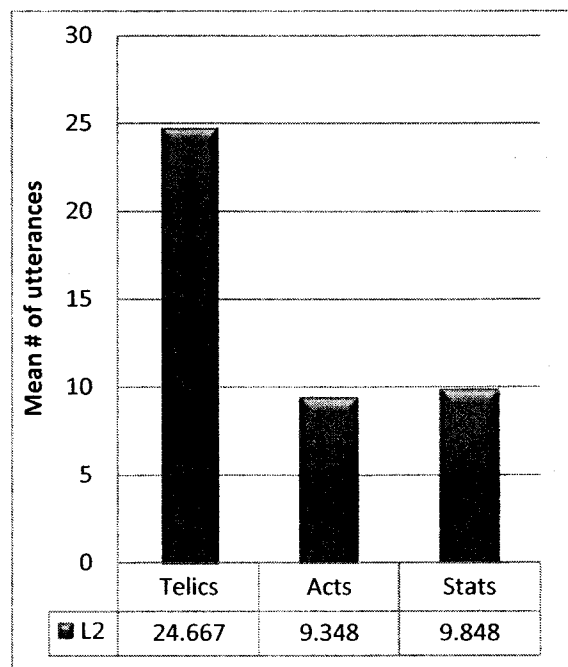
Figure 1b. Distribution of semantic categories of verbs for the Student Group

Figure 1a shows that in the utterances of the Native Speaker Group there were significantly more telic verbs (M = 21.22) than states (M = 10.15), and more states than activities (M =6.14), p < .05 in each pairwise comparison. Figure 1b shows that similar distribution was obtained in the speech of the Student Group. Telics (M = 24.67) were significantly more predominant than states (M = 9.85) and activity verbs (M = 9.35), p < .05. There was no significant difference between the frequency occurrence of states and of activity verbs.

To summarize, telic predicates were found to be predominant in the speech of the Native Speaker Group. The Student Group also produced significantly more telic predicates than other semantic categories of verbs. Having found that telic predicates prevailed in L1 and L2 data, I was interested next to find whether there was a bias for telics to occur more in RMUs compared to non-RMUs.

Research Question #2: Does the same semantic category of verbs predominate in utterances that are considered to be: a) RMUs; b) non-RMUs?

To find the answer to this question, I conducted a post-hoc analysis on the significant Sentence Type x Semantic Category interaction reported above. Figure 2 shows the distribution of each semantic category in RMUs and non-RMUs.

	TELICS	ACTIVITIES	STATES
▣ RMUs	25.27	8.01	10.37
◩ non-RMUs	20.62	7.48	9.63
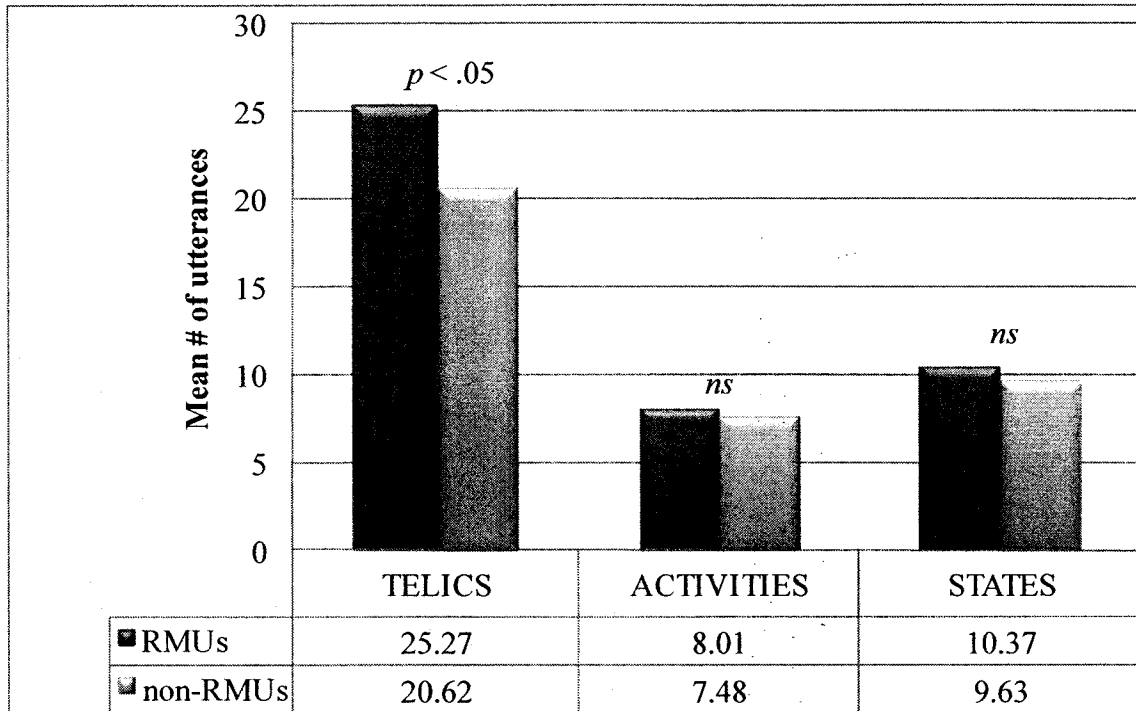
Figure 2. Distribution of semantic categories of verbs in L1 and L2 participants' speech

The figure shows that there were significantly more telic verbs in RMUs ($M = 25.27$) than telic verbs in non-RMUs ($M = 20.2$) in the speech of the two groups combined. There were no significant differences in the distribution of activity verbs in RMUs ($M = 8.01$) and non-RMUs ($M = 7.48$), *ns*. Nor were there significant differences in the distribution of state verbs in RMUs ($M = 10.9$) and non-RMUs ($M = 9.41$), *ns*. This finding shows the predominance of telic verbs in RMUs, albeit here in the speech of both the Native Speaker Group and the Student Group participants combined.

In order to see the distribution of semantic categories of verbs in RMUs and non-RMUs *separately* for each group of participants, I examined the significant three-way interaction of Group x Sentence Type x Semantic Category. Figure 3 below shows the

distribution of the semantic categories in RMUs and non-RMUs in the speech of the Native

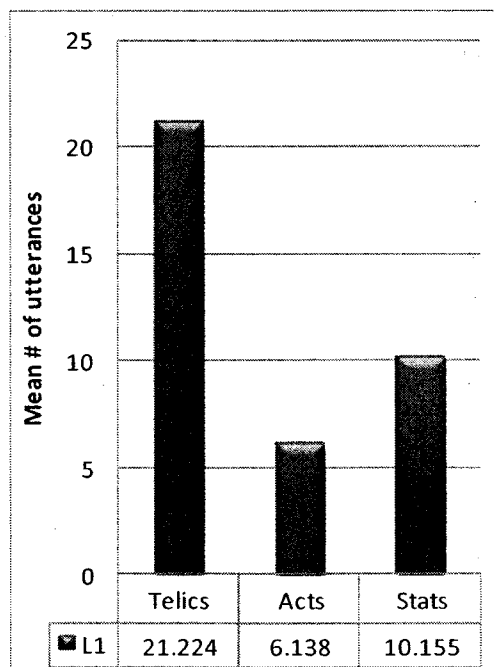Speaker Group (Figure 3a) and the Student Group (Figure 3b).

	TELICS	ACTIVITIES	STATES
■ RMUs	25.9	6.83	10.9
▨ non-RMUs	16.55	5.45	9.41
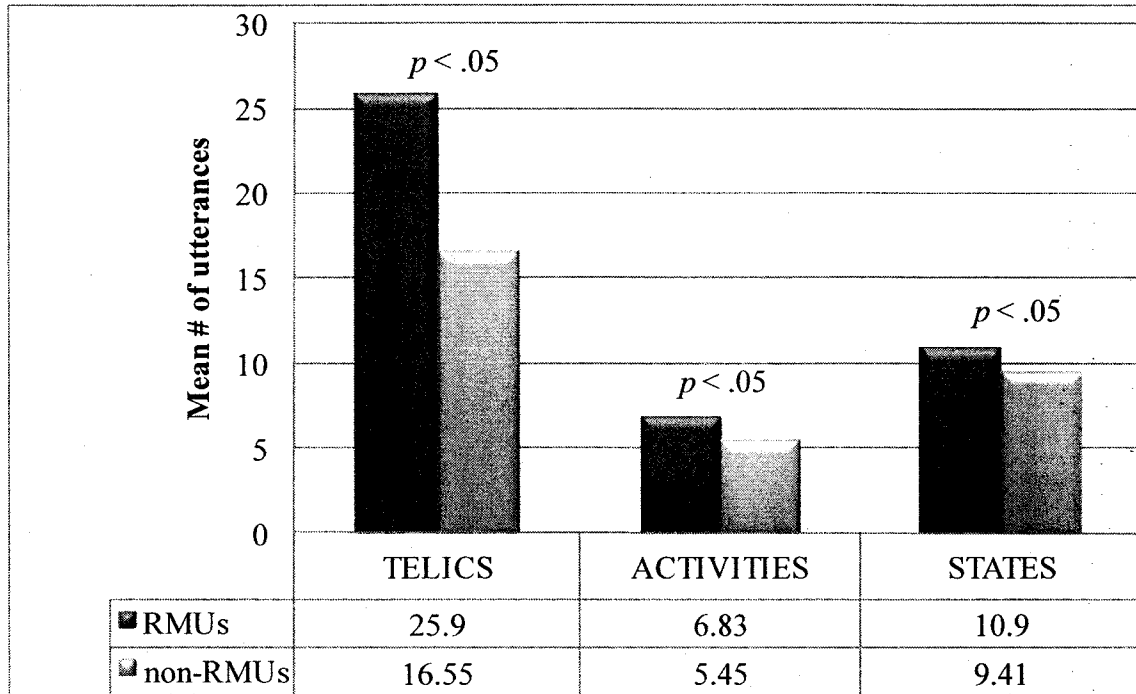
Figure 3a. Distribution of semantic categories of verbs in RMUs and non-RMUs for the

Native Speaker Group

Figure 3a shows that in the speech of Native Speaker Group there were significantly

more telic verbs in RMUs ($M = 25.90$) than in non-RMUs ($M = 16.55$), $MD = 9.35$, $p <$

.001; significantly more activities in RMUs ($M = 6.83$) than in non-RMUs ($M = 5.45$),

$MD = 1.38$, $p < .05$; and significantly more states in RMUs ($M = 10.9$) than in non-RMUs,

($M = 9.41$), $MD = 1.48$, $p < .05$.

Figure 3b below presents the distribution of the semantic categories of verbs in

RMUs and non-RMUs in the speech of the Student Group.

	TELICS	ACTIVITIES	STATES
RMUs	24.64	9.18	9.85
non-RMUs	24.7	9.52	9.85
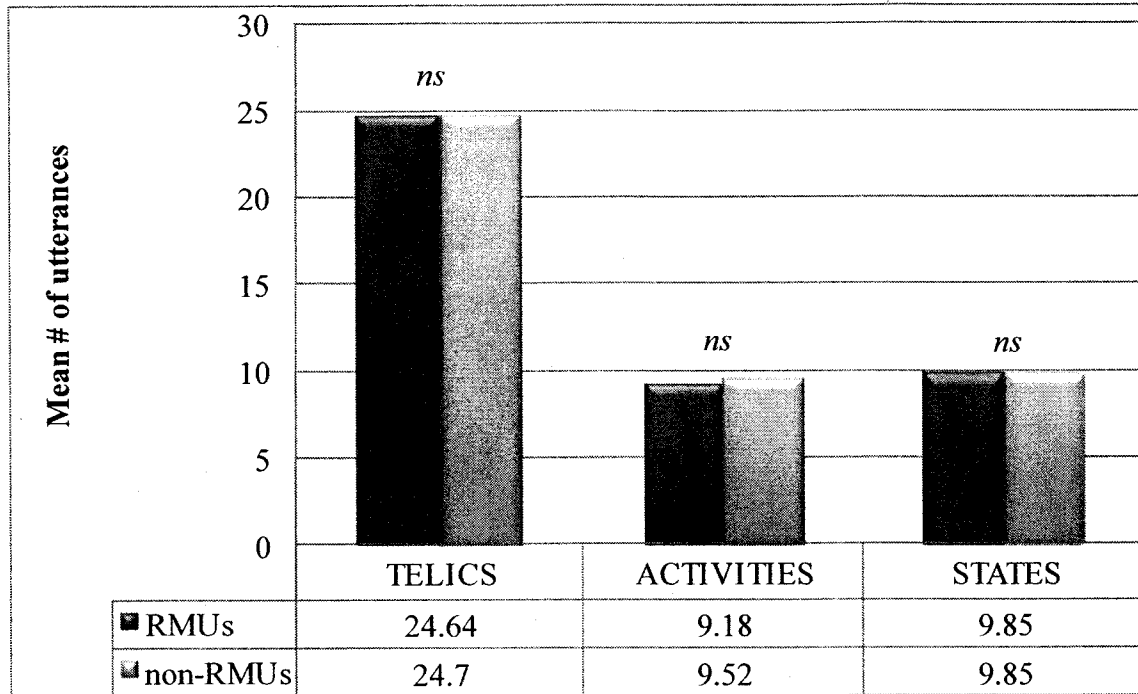
Figure 3b. Distribution of semantic categories of verbs in RMUs and non-RMUs for the Student Group

Figure 3b shows that there were no significant differences in the distribution of telic verbs in RMUs (M = 24.64) and non-RMUs (M = 24.70), *ns*, in the speech of the Student Group. There was also no significant difference in the distribution of activities in RMUs (M = 9.18) and non-RMUs (M = 9.52), *ns*. The same can be said of the distribution of states in RMUs (M = 9.85) and non-RMUs (M = 9.85), *ns*. The results presented in Figure 3a and Figure 3b indicate that telic verbs predominate in RMUs in the speech of the Native Speaker Group only.

Finally, having seen that telics predominated in RMUs in the speech of the Native Speaker Group, I was interested to find whether RMUs predominated more in the speech of the Native Speaker Group than in the Student Group. I conducted a post-hoc analysis on the

significant Group by Semantic Category interaction reported above. Figure 4 below shows

the results of this analysis. The figure indicates the distribution of RMUs and non-RMUs in

the speech of both groups of participants.
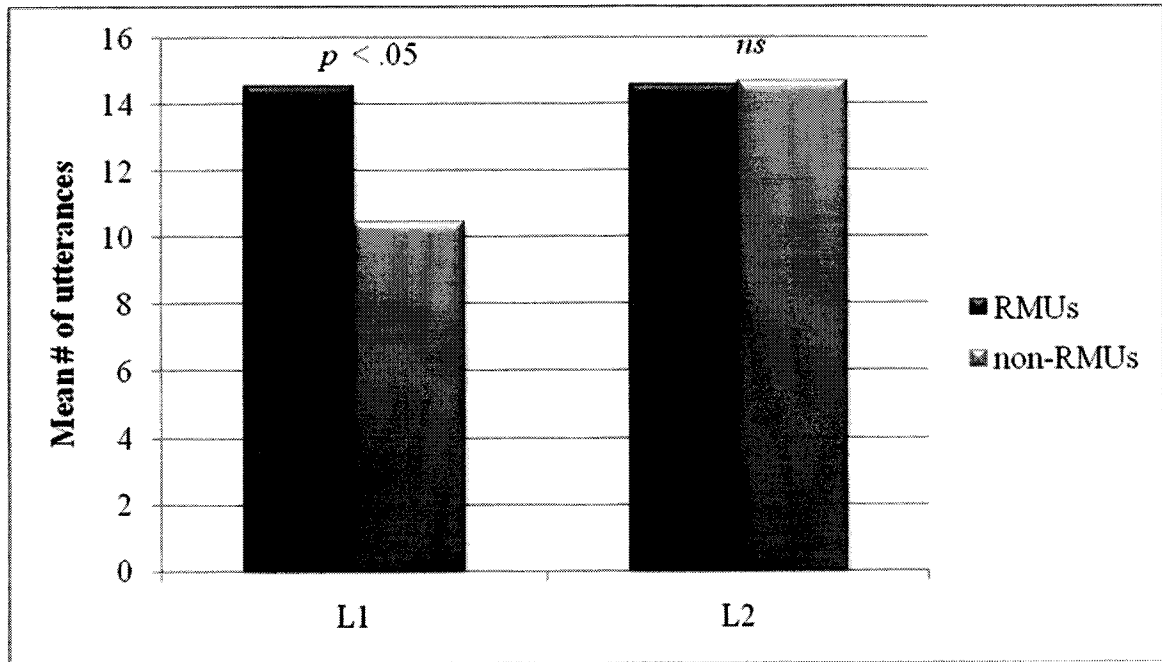
Figure 4. Mean number of RMUs and non-RMUs for the Native Speaker and the Student

Groups

Figure 4 shows that in the speech of the Native Speaker Group, there were

significantly more RMUs ($M = 14.54$) than non-RMUs ($M = 10.47$), $p < .05$. In contrast,

there was no significant difference between RMUs ($M = 14.56$) and non-RMUs ($M = 14.69$), *ns*, in the Student Group's description of their past weekend activities.

To summarize thus far: There were significantly more telics than states and activities

in the speech of the Native Speaker Group and the Student Group. In terms of the

distribution of the semantic categories in RMUs and non-RMUs, there were significantly

more telic verbs in the RMU utterances produced by these participants than telics in their

non-RMU utterances. Finally, there were significantly more RMUs than non-RMUs in the speech of the Native Speaker Group than in speech of the Student Group.

Accuracy of Semantic Verb Categories in RMUs and Non-RMUs in the Student Group

Data

Research Question # 3: Do the semantic categories of verbs associated with L2 RMUs have significantly more accurate past tense morphological markings than the same semantic verb categories produced in L2 non-RMUs?

In order to answer this question, I conducted another three-way repeated measures ANOVA, but this time on the Student Group data exclusively. The between-subjects variables were three levels of L2 Proficiency (Low, Intermediate, and Advanced). The within-subjects variables were again two Sentence Types (RMUs and non-RMUs) and three Semantic Categories (Telics, Activities, States). The data used in this ANOVA were the percentages of correct utterances (defined as utterances containing no errors in verb tense) in the speech of each L2 participant describing his or her weekend.

The analysis yielded a significant main effect of Sentence Type (F (1, 29) = 8.58, p < .01, $\acute{\eta}_p^2$ = .23), a significant main effect of Semantic Category (F (1, 29) = 69.96, p < .01, $\acute{\eta}_p^2$ = .71), and a significant main effect of L2 Proficiency (F (2, 29) = 13.97, p < .001, $\acute{\eta}_p^2$ = .49). The two-way interaction between Semantic Category x L2 Proficiency was significant, F (2, 29) = 5.18, p < .05, $\acute{\eta}_p^2$ = .79, as was the Sentence Type x Semantic Category x L2 Proficiency interaction   (F (2, 29) = 6.38, p < .01, $\acute{\eta}_p^2$ = .31).

An analysis of the significant main effects of Semantic Category revealed that in the speech of the Student Group (regardless of proficiency) there was a significantly higher

proportion of telic verbs (38%) that were correctly marked for simple past than the proportion of correctly marked activity verbs (24.1%) or state verbs (12.2%), $p < .05$ for each pair of comparisons. Figure 5 below shows the percentage of telic, activity, and state verbs that the Student Group accurately produced.
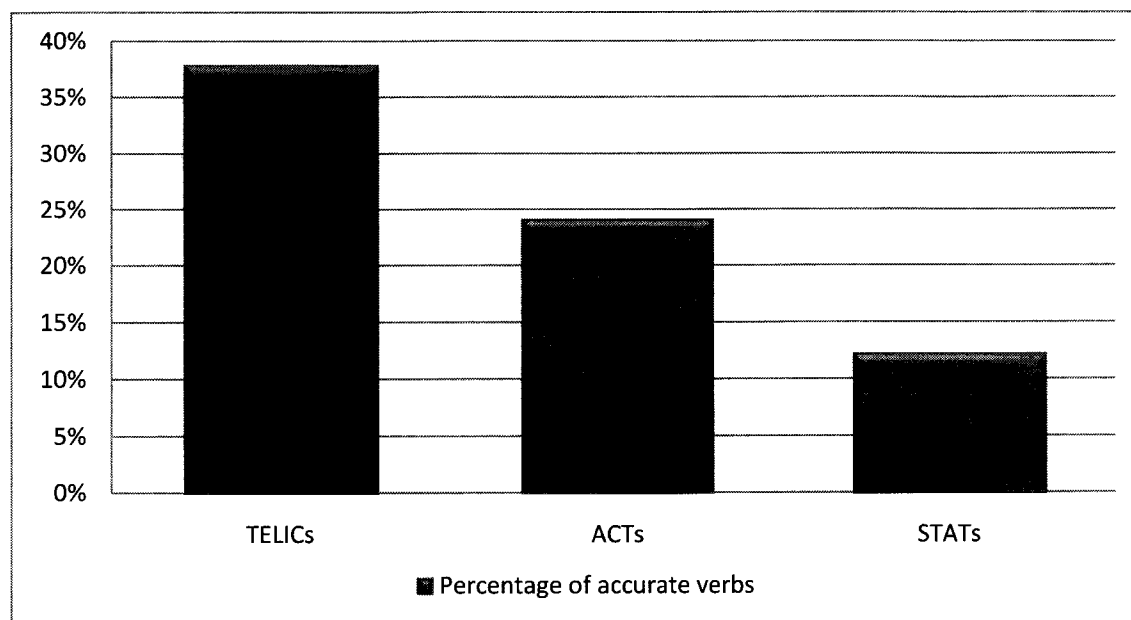
Figure 5. Accuracy of simple past morphological markings by semantic verb category for the Student Group data

This findings shown in Figure 5 confirm that utterances with telic verbs, which predominated in the speech of native speakers of English describing their weekend (as shown in the earlier part of this results section) seem also to be the same kind of utterances that the Student Group marked more accurately for simple past, in comparison to utterances containing either state verbs or activity verbs.

Research Question #4: To what degree are the patterns observed in the third research question affected by L2 proficiency levels?

In order to see whether proficiency was a significant factor in the way the participants marked their verbs for past tense morphology, I examined more closely the significant main effect of the Proficiency variable reported in the three-way ANOVA conducted for Question 3. The findings showed that the proportion of utterances with correctly marked verbs was the highest in the speech of the Advanced Proficiency Group (37%); the next highest, in the speech of the Intermediate Proficiency Group (23%); and the lowest in the speech of the Low Proficiency Group (14%), $p < .05$ in each pairwise comparison. This finding shows that the proficiency level of the speakers interacted with the proportion of verbs that they had marked correctly. The higher the proficiency the higher was the proportion of utterances with correctly marked verbs found in their speech.

With regards to the question of whether there were semantic categories that were morphologically marked more correctly that others by the different proficiency group, I conducted a post-hoc analysis on the significant Semantic Category x L2 Proficiency interaction found in the ANOVA analysis above. Figure 6 below illustrates the percentages of correctly marked verbs in each semantic category for each of the L2 proficiency groups participating in the study.

	Low	Mid	High
TELICs	22.9%	34.2%	56.8%
ACTs	11.3%	22.1%	38.7%
STATs	6.0%	13.9%	16.3%
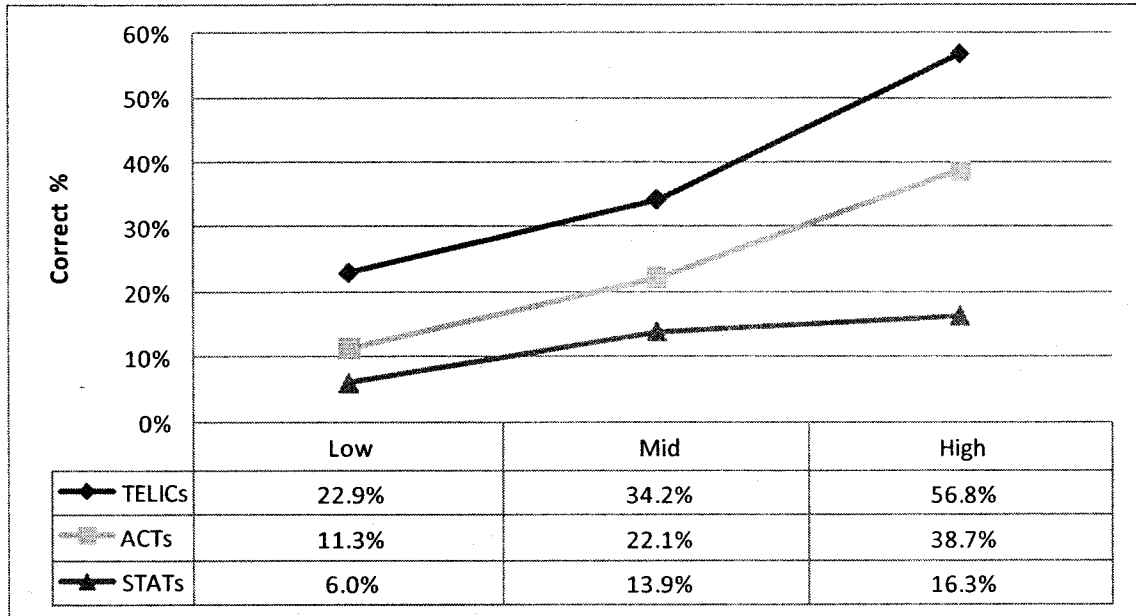
Figure 6. The mean accuracy of marking semantic categories of verbs across three proficiency groups

Figure 6 shows that for the Low Proficiency Group, telic verbs (22.9%) were marked with significantly more correct simple past morphological markings than activities (11.3%, $p < .05$), and than states (6%, $p < .05$) in each pairwise comparison. Similarly, for the Intermediate Proficiency Group telic verbs (34.2%) were more accurately marked than activities (22.1%, $p < .05$) and than states (13.9%, $p < .01$) in each pairwise comparison. Compared to the Advanced Group, there was no significant difference between accuracy with activities and with states in either the Low Proficiency or the Intermediate Proficiency Group. The Advanced Proficiency Group produced the simple past more accurately in telics (56.8%) than in activities (38.7%) and than in states (16.3%), $p < .05$ in each pairwise comparison. For this group, activities were marked significantly more accurately than states ($MD = 22.4\%, p < .01$).

The next question of interest was whether there were significant differences in the accuracy with which semantic categories were marked in RMUs and non-RMUs in the speech of the Student Group. I will report the results of this analysis focusing on the telic data first. Figure 7 presents the mean correct percentage of telic RMUs and telic non-RMUs in the speech of the Low, Intermediate, and Advanced Proficiency Groups. There was no statistically significant difference in the accuracy of telics inside RMUs versus accuracy of telics in non-RMUs for the Low and Intermediate Proficiency Groups. However, RMU telics (63.8%) produced by the Advanced Proficiency Group were significantly more correct than the non-RMU telics (49.8%, $MD = 14\%$, $p = < .05$).

	Low	Mid	High
■ non-RMU TELICs	28,2%	36,7%	49,8%
⊠ RMU TELICs	17,6%	31,7%	63,8%
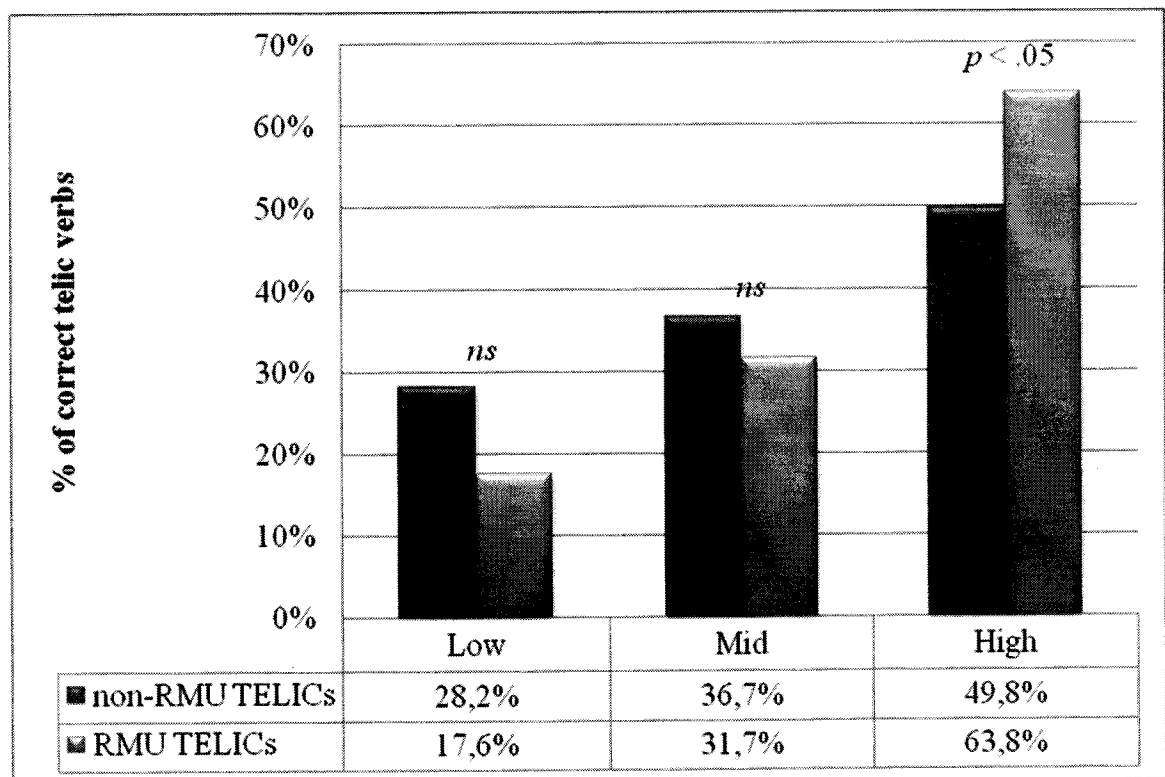
Figure 7. Proportion of accurate TELICs in RMUs and non-RMUs in Low, Intermediate and Advanced Proficiency Groups

The findings so far reported show support for the prediction that telics, which predominated in the RMUs in the speech of the Native Speaker Group, would be produced most accurately by the Student Group.

With regards to the accuracy of RMUs versus non-RMUs in activity and in state verbs, however, a surprising result was obtained. This finding is illustrated in Figure 8 below. The figure shows the proportion of correctly marked activity verbs in RMUs and Non-RMUs in the speech of the different proficiency groups.

	Low	Mid	High
non-RMU ACTs	15%	24.70%	53.50%
RMU ACTs	7.60%	19.60%	24%

Figure 8. Proportion of accurate activity verbs in RMUs and non-RMUs in Low, Intermediate and Advanced Proficiency Groups

Figure 8 shows that there were significantly more correctly marked activity verbs in non-RMUs than in RMUs in the speech of the Advanced Proficiency Group (53.5% vs 24%, $p < .05$). There was no significant difference in the proportion of correctly marked activity

verbs in RMUs compared to non-RMUs in the speech of the Intermediate and in the speech of the Low Proficiency Groups. The greater accuracy of non-RMU activity verbs over RMU activities is unexpected because it was predicted earlier that accuracy would be higher in RMUs than in non-RMUs.

A similar surprising result was obtained with state verbs. This result is illustrated in Figure 9 below.

	Low	Mid	High
non-RMU STATs	9.69%	14.20%	22.40%
RMU STATs	3.22%	13.70%	10.30%

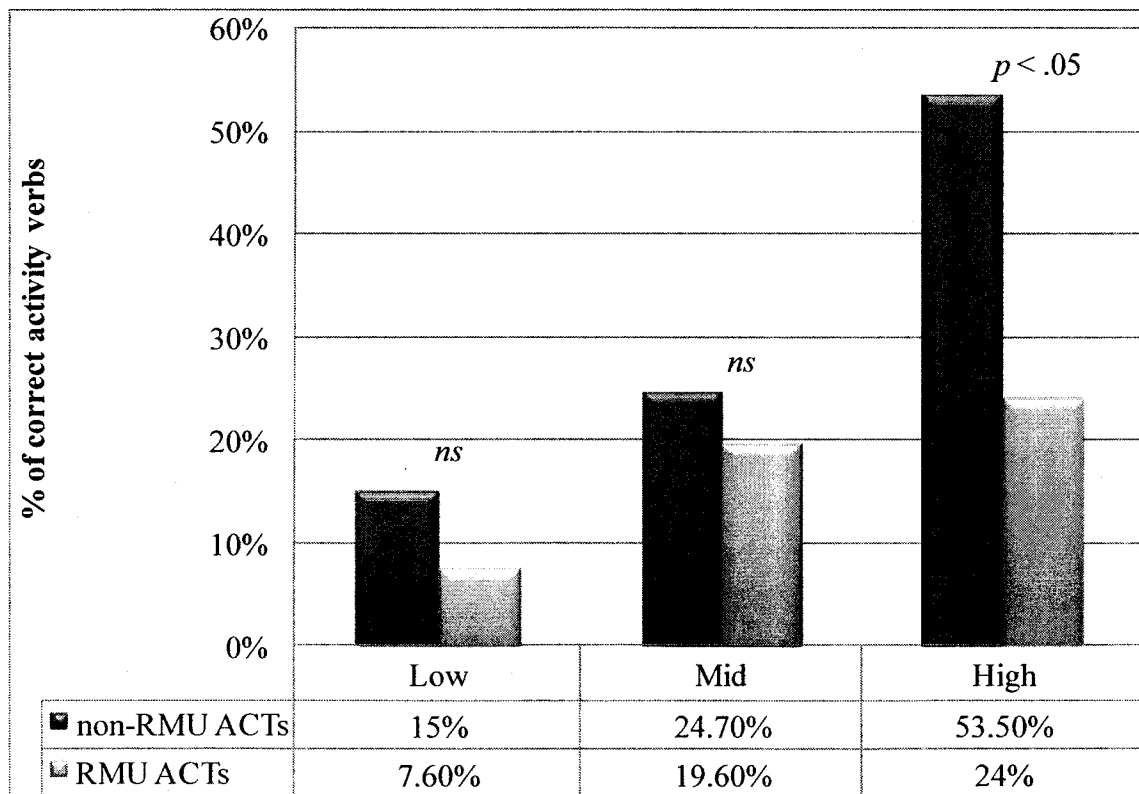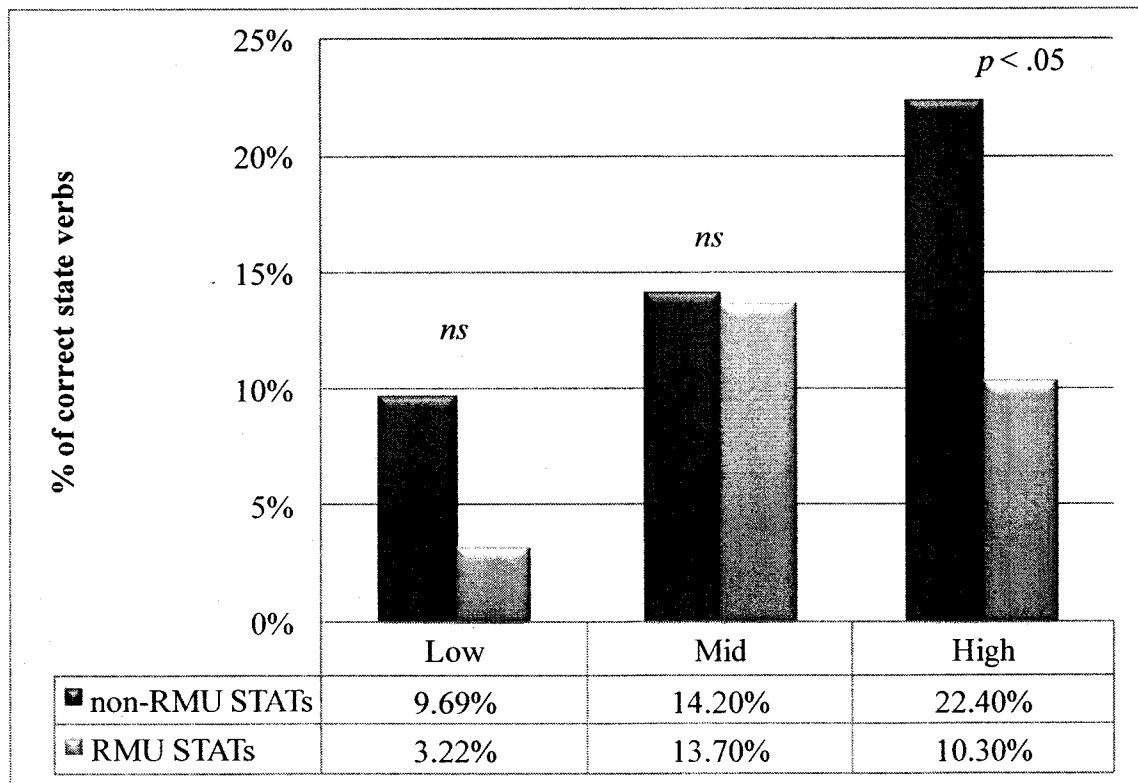*Figure 9.* Proportion of accurate state verbs in RMUs and non-RMUs in Low, Intermediate and Advanced Proficiency Groups

Figure 9 presents the mean level of accuracy of simple past morphological markings inside RMUs and non-RMUs with state verbs. Again, Low and Intermediate Proficiency participants did not show any difference in the accuracy with either RMU states or non-

RMU states, but the Advanced Proficiency participants were significantly more accurate with non-RMU (M = 22.4%) states than with RMU states (M = 10.3%; MD = 12.1%, p < .05), reflecting the same pattern of results obtained with activity verbs, but not the pattern obtained with telic verbs.

In order to find out more details about this surprising result, I examined the actual past utterances produced by the Advanced Proficiency Group, because it was in the speech of this group where greater accuracy with activity and state verbs occurred inside non-RMUs than inside RMUs, the opposite of what happened with telic verbs. Table 4 below shows the raw frequencies of the distribution of semantic categories of verbs by utterance type, RMUs versus non-RMUs.

Table 4

Raw frequencies of semantic verb tokens in non-RMUs and RMUs produced by the Advanced Proficiency Group

	Telics	Activities	States
Non-RMUs	188	84	66
RMUs	185	22	30
Total	373	106	96

Table 4 above shows that, overall, when compared to utterances with telic verbs (373), there were fewer utterances with activity verbs (106), and still far fewer utterances with state verbs (96) in the speech of the Advanced Proficiency Group. The pattern is similar in distribution of the three semantic verbs in RMU and non-RMU utterances. There were far fewer non-RMU utterances with activity verbs (84) and non-RMUs with state verbs (66) than non-RMU utterances with telic verbs (188). Similarly, there were far fewer

RMU utterances with activity verbs (22) and RMU utterances with state verbs (30) than RMU utterances with telic verbs (185).

Further examination of utterances with state verbs alone revealed that the verb "to be" (*is, was, were, been*) accounted for 73% of all state verb tokens. An analysis of the accuracy with which state verbs were produced also indicates that about 20% of the verb "to be" was produced accurately in RMUs, while 36% of the verb "to be" was produced accurately in non-RMUs. It is not clear why the verb "to be" is produced more accurately in non-RMUs than in RMUs, but it could be responsible for the surprising result. A similar analysis of utterances with activity verbs may yield a similar pattern of results but it is probably more fruitful to do so when there is larger number of utterances with this semantic category than presently found in the data set.

To summarize, the results of the study showed that telic predicates predominated in the speech of the Native Speaker Group and the Student Group. For the Native Speaker Group, state predicates were also more prevalent than activity predicates. There were significantly more telic predicates in both RMUs and non-RMUs in the data produced by two groups of participants. When the distribution of semantic verb categories in two utterance types was analyzed separately for each group, the results revealed that the Native Speaker RMU telics were significantly more predominant than non-RMU telics, RMU activities were significantly more numerous than non-RMU activities, and RMU states were significantly more prevalent than non-RMU states. There were no statistical differences in the distribution of semantic categories in RMUs versus non-RMUs for the Student Group. The Student Group marked telic predicates significantly more accurately than activity and state predicates. Simple past morphological markings were not more accurate inside RMUs

than inside non-RMUs for the whole Student Group taken together. For the three proficiency levels viewed separately, only advanced learners showed significant differences in the accuracy of past morphological markings for semantic verb categories in RMUs and non-RMUs. RMU telics were more accurate than non-RMU telics, non-RMU activities were more accurate than RMU activities, and non-RMU states were more accurate than RMU states.

Chapter 5: Discussion

This chapter interprets the results of the study according to the research questions and the predictions that were advanced at the outset of the study and relates the general findings to research in second language acquisition.

Research Question #1 asked whether there is a predominance of a certain semantic category of verbs in all the past utterances that native speakers of English use in describing their weekend. Based on research on the AH suggesting that native speaker discourse shows quantitatively significant tendency to associate tense-aspect morphemes with certain semantic categories of verbs (Andersen & Shirai, 1994; Shirai & Andersen, 1995), the prediction was that there would be a predominance of telic verbs in native speakers' description of their past weekend. The results of the study confirmed this prediction. Tokens of telic predicates were significantly more predominant than tokens of activities and states, a finding which is congruent with previous research (Andersen & Shirai, 1994). An interesting finding was the significantly larger number of utterances with state predicates (counted as tokens) than with activity ones. This suggests that certain semantic categories may predominate in certain speech tasks. However, further analysis by verb types is necessary to confirm this observation as the verb "to be" seems to be predominant in the semantic category of states in the data (e.g., *It was around TIME. That was Saturday. We were tired. It was very hot. I really enjoyed that. We had a busy day, etc*).

Research Question #2 examined whether the same semantic category of verbs predominates in utterances that are considered to be: a) RMUs; b) non-RMUs. As a reminder, RMUs are defined here as three or more words utterances pronounced verbatim

by at least two different speakers or twice by the same speaker, whereas non-RMUs are pronounced once by a single speaker. The findings of the study indicate that in the L1 corpus, telic predicates predominate not just overall, as mentioned above, but also in RMUs and non-RMUs when viewed separately. However, when the proportions of telic predicates in RMUs and non-RMUs were compared, there were significantly more telics in the former. Thus, the prediction about the prevalence of telic verbs in native speaker RMUs was supported. It is interesting to note that other semantic categories of verbs in RMUs and non-RMUs follow the same distributional pattern as telics: RMU activities are significantly more frequent than non-RMU activities, and RMU states are significantly more numerous than non-RMU states.

The result of the study showing that input-frequent RMUs contain significantly more telic verbs than non-RMUs is an important finding. Because a number of researchers claim that frequency effects are important in language acquisition in general (Ellis, 2002a; 2002b), and construction learning (Ellis & Collins, 2009) and acquisition of tense-aspect markers in particular (Andersen & Shirai, 1994; Collins, 2005; Collins et al., 2009; Shirai, 2004; Sugaya & Shirai, 2009; Wulff et al., 2009), it might be that RMUs have their role to play in acquisition of tense-aspect morphology. To illustrate, Ellis (2002a) argues for an emergentist's approach to language acquisition that considers language learning to be examplar based. The examplars are derived from input, stored in a language user's memory and form associations and abstractions of regularities allowing "piecemeal" grammar acquisition. Ellis & Collins (2009) defined four determinants of construction learning: "(a) input frequency (type-token frequency, Zipfian distribution, recency), (b) form (salience and perception), c) function (prototypicality of meaning, importance of form for message

comprehension, redundancy), and (d) interactions between these (contingency of form-function mapping)" (p. 330). Because RMUs, the object of the present study, have high type frequency in the input and they also contain a prevalent number of telic verbs, which are prototypical for the acquisition of simple past, it might be that RMUs influence the order of acquisition of tense-aspect morphology. It is possible, for instance, that input-frequent RMUs contribute to the early acquisition of simple past morphological markings with telic verbs. Of course, further investigation is necessary to find out whether in fact this is the case.

The second part of the study and the last two research questions dealt with the distributional frequency and accuracy of past tense morphological markings of different semantic categories of verbs produced by L2 learners. Similarly to L1 speech, telic predicates predominated in the Student Group descriptions of their weekend. Telics were also the category which received the most accurate past tense morphological markings, followed by activities and states. These results are in agreement with the findings from other empirical studies on the AH (Bardovi-Harlig, 1998; Bardovi-Harlig & Reynolds, 1995; Collins, 2002, 2004, 2005, 2007; Izquerdo & Collins, 2008; Salaberry & Shirai, 2002).

Research Question # 3 explored whether the semantic categories of verbs which are associated with RMUs would be marked more accurately for the simple past than the same semantic verb categories produced in non-RMUs. The predominant semantic category for RMUs was telics, so it was expected that telic verbs would be marked more accurately in RMUs than in non-RMUs, based on the speculation that telics are more strongly associated with RMUs and used in them frequently, so they would be more accurate there as well. The statistical tests did not show any significant difference in the accuracy of marking simple

past tense telics in either RMUs or non-RMUs for all the participants in the Student Group. The explanation for this result may be the fact that there was an interaction with proficiency and accuracy in the production of RMU and non-RMU sentence types. Because of this interaction, it is possible that when all the RMUs and all the non-RMUs were collapsed across proficiency groups, any significant differences between these two sets of utterances disappeared. In order to derive a more accurate picture of how RMU and non-RMU verbs are marked morphologically, I will examine this issue again in relation to the findings for the next research question (Question #4).

Research Question #4 examined whether the accuracy of simple past markings for the semantic categories of verbs in RMUs and non-RMUs is affected by different L2 proficiency levels. The differences in accuracy turned out to be significant when each of three proficiency groups are examined separately. The patterns were as follows. The Low Proficiency Group and the Intermediate Proficiency Group did not show any difference in accuracy in their morphological markings for telics in either RMUs or non-RMUs. In contrast, the participants from Advanced Proficiency Group produced significantly more accurate past tense markers for telics in RMUs than telics in non-RMUs. One possible explanation for these findings may be that without direct instructions on how to take advantage of RMUs, learners do not yet profit very much from being exposed to these utterances. Advanced learners, on the other hand, have had more time to be exposed to RMUs so that they could profit more from their presence in the input. Thus, despite the fact that RMUs were frequent in the input, the low and intermediate learners could not take advantage of their presence in order to become accurate with the telic verbs they contain. In contrast, having already had the exposure they needed to take advantage of the

frequency of RMUs in the input, the advanced learners were able to learn more accurately the telic verbs in RMUs than the telic verbs in non-RMUs. Obviously, the conclusion that learners cannot really profit from faster learning of telic verbs in English simple past until they are able not only notice L1 RMUs in their input and but also use them productively is a preliminary one; the issue needs to be further researched longitudinally.

The study has also raised a number of other issues. The results of the study showed that recurrent multi-word utterances (RMUs), which are minimum three-word long and pronounced verbatim by at least two different speakers, are significantly more frequent in the native speaker discourse describing their past weekend than non-recurrent multi-word utterances (non-RMUs), that is the ones pronounced by one speaker exclusively. This finding supports the wide-spread idea that recurrent multi-word utterances abound in natural speech and may be useful to acquire for the second language learners (Lewis, 1996; Nattinger & DeCarrico, 1992; Pawley & Syder, 1983; Weinert, 1995; Willis, 1990; Gatbonton & Segalowitz, 2005). On the other hand, the Student Group showed no significant difference in the number of RMUs (L1 RMUs being a model) or non-RMUs they produced while describing their past weekend. This finding might indicate the general lack of knowledge of L1 formulas or difficulty to use them productively, which is congruent with the findings of psycholinguistic researchers in the field of formulaic language who outline that unknown L1 multi-word utterances might be a special challenge for L2 language learners (Schmitt, Grandage, & Adolphs, 2004; Schmitt & Underwood, 2004; Underwood, Schmitt, & Galpin, 2004; Van Lancker Sidtis, 2004).

The distribution of semantic categories of verbs in the descriptions of past weekend produced by the Student Group participants demonstrates that L2 speech mirrors L1 speech

in that telics are more abundant than activities and states. This finding, coupled with the finding of a lack of significant difference in number of RMUs and non-RMUs produced by the Student Group, might indicate that L2 learners are not very sensitive to recurrent multi-word utterances in their input. It is only an assumption which should be addressed in the future research, as this study has not really investigated what kind of exposure to English functional language Chinese undergraduates had outside of their English classroom.

The results of this study also seem to be congruent with Shirai's (2004) observation made on some empirical studies with L2 production data (Bardovi-Harlig & Bergström, 1996; Lee, 2001; Robison, 1995; Rohde, 1996). Shirai concluded that results of those studies do not perfectly observe the predictions of the AH in terms of the release of reliance on prototypical accounts with the increase of learners' proficiency level. The AH advances that the influence of prototypical semantic categories (telics for English simple past) decreases as the learners become more proficient in L2, that is the learners start to attribute correct past tense markings first to activities and then to states. The results pattern of the present study analyzed by proficiency level do not perfectly fit this part of the AH. For the Low and Intermediate Proficiency Groups, telic verbs were significantly more accurate than activities and states, but there was no significant difference in the accuracy of the markings for activities and states. The Advanced Proficiency Group was the one under the biggest influence of the prototypical accounts: the telic verbs were significantly more accurate than activities, and activities were significantly more correct than state verbs. The explanation of the similar deviations from the AH patterns advanced by Shirai (2004) is constraints of oral language production when beginner and intermediate learners may have to rely on rote-learned formulas, so that they are less influenced by the prototypical form-meaning

associations. Because the findings of this study do not point in the direction of overuse of L1 RMUs by beginner and intermediate learners, the issue should be further investigated. It is possible that beginner and intermediate learners rely heavily on L2 formulas before they start producing L1 formulas at the more advanced proficiency levels.

Finally, one more intriguing finding concerns the accuracy of past tense morphological markings of activity and state verbs. The Advanced Proficiency Group produced activity and state verbs inside non-RMUs significantly more accurately than inside RMUs. Two explanations seem to be reasonable here. First, the finding can be explained by small numbers of utterances produced with activities and states. For instance, there were only 22 RMU types containing activity predicates versus 84 non-RMU types with activity predicates. The state predicates were produced in only 30 RMU types versus 66 non-RMU types. Second, the analysis of verb types inside RMUs and non-RMUs containing state predicates is also revealing. The verb 'to be' accounts for 73% of all state verb tokens in both non-RMUs and RMUs. It points to several conclusions. The results are consistent with the research on the AH which found that the verb 'to be' predominated in the semantic category of states used in the simple past. The frequency of the verb 'to be' in the descriptions of the past weekend does not necessarily mean that this irregular verb is used accurately, as the verb "to be" was accurately produced in only 20% of RMUs and 36% of non-RMUs. It is difficult to imagine that the Advanced Proficiency Group in this study does not know the past participle of the verb 'to be'. It is possible, however, that the pressure of on-line production and the informal character of descriptions makes them use 'to be' in the simple present instead of simple past, the latter being more usual and appropriate use, according to the native speaker model. More importantly, the post-hoc analysis shows

the necessity for future research to look not only at the types of RMUs and non-RMUs, but also at the types of verbs they contain. It might be that the recurrent multi-word utterances provide a partial explanation to the patterns of the AH. Future research analyzing RMUs should pay special attention to type and token frequencies of verbs they contain. In support of this idea, the theoretical reviews by Ellis and Collins (2009) and by Boyd and Goldberg (2009) have underscored the importance of considering types when investigating the role of frequency in general.

The empirical research also points in the direction of distinguishing between type and token frequencies. To illustrate, Collins et al. (2009) compared the opacity profiles of the perfective simple past, the progressive aspect, and the possessive determiners *his/her*. While comparing simple past and progressive, they found out that raw token frequencies were not representative of the difficulty of construction, as neither of constructions was frequent: simple past occurred with 9% of tokens (2% with regular and 7% with irregular verbs), and progressive represented 5% of tokens in the input. The situation was quite different for the types of verbs in these two constructions: 98% of irregular past verb types were among the 1,000 (1K) most frequent words in English (Heatley & Nation, 1994), but only 58% of regular past verbs were among the same frequency band. Progressive aspect occurred with 70% of verbs from 1K, but it was repeated frequently with different types of verbs. For instance, 26 types of verbs were repeated eight or more times with progressive markers, whereas only four verb types were often repeated with regular past. The authors conclude that type rather than token frequency, coupled with the phonetic and perceptual salience make simple past more difficult to acquire, than, for example, progressive aspect. Concerning the present study, it may also be the case that recurrent multi-word utterances

contain many more irregular than irregular verbs, as the 20 most frequently repeated native speaker RMUs contained mostly irregular verbs (Appendix C).

Similarly to Collins et al. (2009), McDonough and Kim (2009), who examined the acquisition of *wh*-questions by EFL learners, found that those learners who were exposed to a bigger number of verb types during the priming task performed better with question formation than those participants who were exposed to the same number of tokens but a smaller number of verb types. Thus, further analysis of multi-word utterances according to the types of verbs might as well shed new light on the acquisition of tense-aspect morphology. It is possible that if RMUs contain mostly irregular verbs, than they may promote the acquisition of syntax rather than regular past morphology. Some suggestions for syntax acquisition may be verbs with complements and prepositional phrases.

Chapter 6: Conclusions

The concluding chapter summarizes the major findings of the study. It deals with the limitations of the present research and suggests pathways for further investigation. The chapter also proposes some pedagogical implications based on the present findings.

The present study has established a strong association between recurrent multi-word utterances in English native speech and telic predicates. It is an interesting finding which should be further investigated in terms of its influence on the accuracy of acquisition of past tense morphological markings by L2 learners. The Student Group in this study mirrored L1 speech in that telic predicates were more predominant than activities and states. Telic predicates were also most accurately marked in simple past in all multi-word utterances produced by L2 learners. The findings also suggest that advanced learners were significantly more accurate while marking simple past with telics in RMUs versus those in non-RMUs. The accuracy of beginner and intermediate learners did not seem to be affected by the types of utterances (RMUs or non-RMUs). Further research with a larger number of L2 participants to divide into proficiency groups is necessary to clarify the results.

The present research provides intriguing results on the role of RMUs in acquisition of simple past morphological markings. However, the generalizability of the findings should be further investigated, as the study was limited to one population of university learners in a particular context, and only one speech function being focused upon, namely the description of a past weekend. Exploring other speech tasks, like narrating (for instance, narration of a silent film was used as a production data by Bardovi-Harlig (1998)), thanking, apologizing,

et cetera may result in different distribution of semantic verb categories in L1 and L2 discourse.

Also, considering L1 RMUs as a model for L2 RMUs is not the only way to proceed. The present study did not investigate whether learners were exposed to English outside the academic setting. It is possible that some of them had limited or no contacts with English native speakers, so that they had few chances to learn L1 conversational formulas. Instead, they might have used L2 RMUs which were grammatically correct but pragmatically inappropriate or simply different from the way a native speaker would say it. Examining RMUs which are peculiar to second language learners might provide additional insights on the effects of frequency on acquisition of tense-aspect markers. It is probable that if L2 RMUs are also taken into account, then the association between RMUs and certain semantic categories of verbs might be just strengthened.

It will be useful for future research to examine the types of verbs, especially the semantic category of states, which RMUs contain. It will be interesting to see how accurately L2 learners attribute tense-aspect morphological markings not only to semantic categories of verbs in general, but also to specific verb types, the analysis which has already being conducted in several empirical studies (Collins et al., 2009; McDonough & Kim, 2009; Sugaya & Shirai, 2009; Wulff et al., 2009).

This study examined cross-sectional data from L2 participants. Ortega and Byrnes (2008), the editors of the volume of empirical longitudinal studies, argue for longitudinal investigation of advanced L2 capacities. A longitudinal study might provide a clearer picture on the acquisition of past tense morphological markings in RMUs. It might, for

instance, clarify how adult L2 learners acquire L1 RMUs and at what point they might analyze them to extract grammar rules.

Future investigations should also consider whether instruction focusing on recurrent multi-word utterances facilitates the acquisition of simple past morphological markings by ESL learners. Although many studies have argued for teaching different types of formulaic sequences to second language learners (Lewis, 1996, 1997; Nattinger & DeCarrico, 1992; Pawley & Syder, 1983; Willis, 1990), the proposal by Gatbonton and Segalowitz (2005) seems to be the most appropriate one for pedagogical intervention. Their *Automatization in Communicative Contexts of Essential Speech Segments (ACCESS)* methodology differs from those by other researchers in that pedagogically useful formulas, called essential speech segments, are to be learned as wholes, without breaking them into constituent parts. Then, if the conditions are right (some level of automaticity with them is reached, for instance), learners may break them down into smaller parts in order to understand the relationship. Thus, learning formulas might induce systemic change, as it may assist learners to extract grammar rules and common structures exemplified in these essential speech segments.

Some pedagogical implications which should be considered from the study are the following. Frequency is an important factor to take into account while teaching second language in general and English simple past in particular. Teaching RMUs which are frequently used by L1 speakers may help L2 learners to acquire English past tense morphology with telics as well as other semantic categories of verbs by providing appropriate exposure to those verbs in various and meaningful contexts (Collins, 2007). Especially promising is the finding that L1 RMUs describing past weekend contain a lot of

state predicates in simple past, as simple past state predicates represent a special difficulty for L2 learners to master. Also, it is advisable for textbook and material designers to consider including recurrent multi-word utterances in the repertoire of functional language.

In conclusion, the findings of the study lend support to the importance of frequency effects in second language acquisition. They also suggest that some other factors, like input, L1, pedagogical intervention, learner proficiency, which should be further investigated, might influence acquisition process and interact with input frequency and each other in inconspicuous ways, highlighting the complexity of language learning.

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Appendices

Appendix A

An example of L2 data coded for errors

Subject	Line	Preceding context	Past Verb-Centered Utterance
S1	48	go [zWVT] out again.	I bought some post card [z-PLUR]. I want [zWVT] to post to send
S1	80	Is that right?	What would you write? Maybe [z-SUBJ] have [zWVT] a cup of
S2	40	was raining outside so	I cleaned my clothes and my house. So after that I went to his home. That's all. Thank you
S2	2	up and then, yeah,	I cleaned [ZWLEX] my face and I had the [Z+ART] breakfast. With milk. And then I stayed at
S3	72	That's the same thing	I say [zWVT]. The cinema? The group. Okay. Times [z+PLUR]
S3	70	three place [z-PLUR]	we visit [zWVT], we visit [zWVT] three place [z-PLUR] ? Okay
S4	152	I have [zWVT] 1 and	we had, we had supper in Chinatown. Uh, we ate, we ate Chinese
S4	183	we took on [z+PREP],	we get [zWVT] on, we got on the, the bus, the bus on [zWPREP]
S5	64	there with (Wanda)	They offered a bus. Yeah we took that bus to Ottawa and I think we have
S5	68	to Wanda. Yeah	we got [=PREP] Ottawa by one bus. And then we sleeped and we stayed
S6	84	something [z- PREP]	who we saw on [zWPREP] the Great Wall? Spoke to, we just spoke to [z
S6	102	friend and uh the fa,	the family suggested we go, we go to the [z+ART] uh Angrignon to
S7	162	[[zWORDER]	I and my husband didn't go to sleep so until[[zWPREP] the[
S8	146	[zWPREP] Saturday	I found [[z-LEX] my baby had [[z-ART] fever so so I'm I'm[[zWVT]
S9	15	I brushed my teeth	and washed my face and so on. [z -REF] Like, like this.Um, And you? Or [z
S9	5	and then I, [[zNNL]	I cooked my breakfast. And after after I finished my breakfast, I
S10	6	there one day even.	Did you think we should give [-ART] name for the? Any name, any name, any name. Where
S10	49	she bought a skirt and	I bought one [zWLEX] um uh just [z+LEX] like [z+LEX] a jacket
S11	120	friends? Yes. In China.	We phoned friends in China. In china, your parents? Yes, we don't know. Leaves. Summer
S11	130	Snow you met Snow	you telephoned Snow. And then we watch [ZWVT] TV and then we go [ZWVT] to bed. Nine
S12	57	Yeah, after that	I invited them to go to my house and uh make [zWVT] some
S12	9	like that and it took,	it took half an hour by metro to go to the bank to work. And my
S13	40	CBC at that time and	I watched [z-DOBJ] but I forgot [zWVT] the name. It's [zWVT]
S13	91	home, went back home	and prepared the [z+ART] dinner and [z+LEX] uh [z-SUBJ] was

Appendix B

A sample of the data rearranged by concordancing program and presented in excel file displays multi-word utterances in context with the possibility to see who produced the utterance and calculate the number of occurrences for further classification into RMUs and non-RMUs.

Participant	Line	Preceding context	Verb-centered utterance
S18	8	were there. And then	I went to bed. Half an hour read, then
S4	39	I just felt tired and	I went to bed. And I slept till about eight
S5	46	my husband, an then	I went to bed. So that's Wednesday
S9	178	I went home. And	I went to bed. So, Saturday
S17	172	watched a little t.v.	I went to bed around 11. Yesterday? I
S19	54	assignment, and	I went to bed after that around 11
S19	34	game, and then	I went to bed. For Sunday, ok, Sunday, I
S29	56	and, uh I guess	I went to bed. No, I woke up Saturday
S1	44	and then he left and	I went to bed. I slept from my Saturday
S1	25	some TV and	I went to bed. And that was my
S23	47	(laughter) And then	I went to bed. Yes! Different from
S11	7	three hours, ah then	I went back to bed, (incoherent), for
S5	81	left, and um,	I basically went to bed at that point
S26	5	with her family, and	I finally went to bed. And, uh, met
S1	66	I came home and	I went right to bed. That's it.

Appendix C

RMUs which were the most frequently produced by English native speakers describing their

weekend:

1. I woke up

2. I/we went to bed

3. I/we got up

4. I/we had breakfast

5. I/we had to VP [*drive/come to the university/eat dinner*]

6. I/we went to (the) PLACE [*Club Med/ Greece/ the airport*]

7. I/we went out

8. I/we did not VP [*answer it/do the guided tour*]

9. I/we came home

10. I/we had a NP [*cup of coffee/ sleepover/ picnic*]

11. We decided to VP [*take off/ walk back downtown/ have supper*]

12. It was really ADJ [*wonderful/ good/ fun/ hot/ cool/ hard*]

13. It was about TIME [*two o'clock/ eleven/ eight thirty*]

14. I/we had lunch

15. I/we ended up VERBing [*staying up/making dinner/ staying home/ meeting*]

16. We were in PLACE [*Ottawa/ Montreal/ terminal number four*]

17. We went back to the PLACE [*apartment/ campus/ hotel*]

18. It was raining

19. We got there

20. I did some VERBing [*reading/ shopping/ gardening*]