universität wien

DIPLOMARBEIT

Titel der Diplomarbeit

The Role of Grammatical and Lexical Aspect in the Foregrounding / Backgrounding of Events during EFL Reading

Verfasserin

Monika Susanne Boniecki

angestrebter akademischer Grad

Magistra der Philosophie (Mag.phil.)

Wien, 2011

Studienkennzahl lt. Studienblatt: A 190 344 333

Studienrichtung lt. Studienblatt: UF Englisch UF Deutsch

Betreuerin: Ao. Univ.-Prof. Mag. Dr. Christiane Dalton-Puffer

Acknowledgements

First, I want to thank my supervisor Ao. Univ.-Prof. Christiane Dalton-Puffer for her suggestions during the design of the present experiment and for her feedback on the writing up of the thesis. But most of all, I want to thank her for the motivation she was able to strengthen in me throughout my studies.

I also want to thank Professor Joseph Magliano, Ph.D. His article Magliano and Schleich (2000). Verb Aspect and Situation Models. *Discourse Processes*, 29(2), 83-112 was the starting ground for the present thesis. Professor Magliano was so kind as to share his test material with me. Reading it enabled me to thoroughly understand his research and greatly helped me in writing my own test stories.

Furthermore, I am very grateful to all my participants. They put a lot of time into completing the experiment and were very eager to help me. Moreover, they showed a lot of interest in the theoretical background of the experiment and also commented very positively on the test stories. This truly amazed me and gave me a lot of motivation during the work on this thesis.

The statistical analysis was a challenge in itself. Mag.a Kerstin Schinagl offered her help. She introduced me to some basics of SPSS and gave me valuable suggestions for further reading which enabled me to carry out the analysis and the writing up of the results. Without these introductory steps the challenge would indeed have been too big.

Moreover, I want to thank my friends for taking my mind off and supporting me. Especially, I want to thank Colleen who nagged me with questions about the progress of this thesis and who showed never-ending encouragement. Christina, Julia, Kerstin and Tini also deserve special thanks as they recruited some participants for my study and so greatly helped me in pursuing my research question.

And above all, I want to thank my mother who has always been supporting me with her loving care in every possible way.

Declaration of Authenticity

I confirm to have conceived and written this paper in English all by myself. Quotations from other authors and any ideas borrowed and/or passages paraphrased from the works of other authors are all clearly marked within the text and acknowledged in the bibliographical references.

Vienna, 2011 _____

Table of Contents

Abbreviations

ATA	Actionality, Temporality, Aspect
CDS	Child Directed Speech
Ɛ	Epsilon
EFL	English as a Foreign Language
ESL	English as a Second Language
F	F-value
L1	First Language
L2	Second Language
M	Mean
MD	Mean Difference
NP	Noun Phrase
p	p-value
SD	Standard Deviation
SE	Standard Error
UWL	University Word Level
VP	Verb Phrase

Introduction

Background and Research Questions

The present thesis is concerned with English as a Foreign Language (EFL) story comprehension. Story comprehension is nowadays understood as the construction of a mental representation of the events being described in a story. This mental representation is called *Situation Model* (van Dijk & Kintsch, 1983) or *Mental Model* (Johnson-Laird, 1983). The *Situation Model* includes information about *what* happened *when*, *where, why*, and *who* was involved in it (e.g. Zwaan, 1999a). As the story progresses, the *Situation Model* has to be updated. New information about, for example, the time and location of the event or the characters has to enter the *Situation Model*. However, the human mind is limited in its capacity (e.g. Just & Carpenter, 1992). Therefore, not all old information can be kept accessible in memory (foregrounded) and so becomes less accessible (backgrounded).

The purpose of the present thesis was to investigate this process of information foregrounding/ backgrounding in story comprehension. This issue is especially interesting from a second language (L2) research perspective. L2 readers who are not fluent operate on strained working memory resources during the reading process (Zwaan & Brown, 1996, pp. 290-291; Segalowitz, 2003). This is because L2 word access and syntactic processing are not automatised. Based on the assumption of a strained working memory, the question arises whether foregrounding/ backgrounding in a L2 is quantitatively different from foregrounding/ backgrounding in a first language (L1) (i.e. shorter foregrounding) and whether L2 proficiency plays a role.

Information foregrounding/ backgrounding affects all of the information in a *Situation Model*. The present thesis is only concerned with the foregrounding/ backgrounding of time as expressed in language by the linguistic category of aspectuality (grammatical and lexical aspect). The role of aspectuality in foregrounding/ backgrounding has already been the topic of several L1 processing studies, and also one L2 processing study (see Chapter 2.2.2). Concerning grammatical aspect, previous research in the field of L1 reading has shown that grammatical aspect (perfective vs. progressive aspect) significantly influences accessibility. For example, Magliano and Schleich (2000) demonstrated that an activity (e.g. *deliver baby*) was more highly activated in memory when read in progressive aspect (e.g. *was delivering the baby*) than in perfective aspect (e.g. *delivered the baby*) (Experiments 3 and 4).

In the field of L2 reading, first results also point to the importance of grammatical aspect for foregrounding/ backgrounding. Importantly, however, morphological marking of grammatical aspect in the L1 (morphologically explicit vs. non-explicit) has been identified as a major factor in the process of foregrounding/ backgrounding. Seegmiller, Townsend, Call, Mancini and Ilia (2005) carried out a pilot study which was based on Magliano and Schleich (2000). The authors found that whereas L2 English readers of an L1 explicit language foregrounded/ backgrounded events in the same way as English native speakers, L2 readers of an L1 non-explicit language foregrounded/ backgrounded events in a qualitatively different manner. That is, the former group foregrounded progressive events and backgrounded perfective events, while the latter foregrounded perfective events and backgrounded progressive events.

Concerning lexical aspect (i.e. predicate type), first results in the field of L1 reading indicate that predicate telicity also has an effect on the foregrounding/ backgrounding of events. Seegmiller and his colleagues (e.g. Seegmiller, Ingraffea, & Townsend, 2003) have shown that telic predicates (e.g. *The firemen rescued a survivor*.) are foregrounded, while atelic predicates (e.g. *The firemen rescued survivors*.) are backgrounded. Although it seems plausible that predicate telicity acts as a linguistic cue on foregrounding/ backgrounding, it is as yet unclear how Seegmiller et al.'s finding can be interpreted within a wider model of reading comprehension.

In the field of L2 reading, the influence of lexical aspect on foregrounding/ backgrounding has likewise been investigated. Seegmiller, Townsend, Call, Mancini and Ilia (2005) found that L2 readers do not attend to predicate telicity during story comprehension. This result seems rather puzzling in light of previous research on L2 lexical, morphological and syntactic processing (e.g. Lee, Cadierno, Glass, & VanPatten, 1997; Clahsen & Felser, 2006). There it has been suggested that L2 readers process lexical content information first, while underusing form information. Thus, the question arises whether Seegmiller et al.'s results can be replicated.

The above mentioned work addresses first important issues about the role of grammatical and lexical aspect in foregrounding/ backgrounding, but no on-line reading study so far has investigated the possible interaction between grammatical and lexical aspect in foregrounding/ backgrounding. However, such an interaction seems likely, taking into account previous research on aspectuality. Research in L1 sentence processing has demonstrated that grammatical aspect and lexical aspect strongly interact in that perfective sentences are processed faster when they include accomplishment predicates (e.g. *bake a cake*), and progressive sentences are processed faster when they include activity predicates (e.g. *play the piano*) (Yap, Kwan, Yiu, Chu, Wong, Matthews, & Shirai,

2009). Furthermore, research in L2 acquisition has also shown that grammatical aspect and lexical aspect interact. Numerous studies provided evidence that imperfective aspect is first used with state predicates (e.g. *He always knows the answer.*), progressive aspect with activity predicates (e.g. *She was swimming.*), and perfective aspect with achievement predicates (e.g. *The child painted a picture*) (see Bardovi-Harlig & Comajoan, 2010 for a review). Taken together, these findings raise the question whether grammatical and lexical aspect play a role in the foregrounding/ backgrounding of events during story comprehension.

Based on the theoretical background, an on-line reading experiment was designed (see Part II) and the following research questions were formulated:

- Do L2 readers demonstrate a **foregrounding/ backgrounding** effect of aspectual information during narrative comprehension? If so, does L2 proficiency play a role in this process?
- Does **grammatical aspect** influence L2 foregrounding/ backgrounding during narrative comprehension, and if so, is there an effect of L2 proficiency?
- Does **lexical aspect** have an impact on L2 foregrounding/ backgrounding in narrative comprehension, and if so, does L2 proficiency have an influence on this process?
- Finally, is there an interaction between **grammatical and lexical aspect** in the foregrounding/ backgrounding of aspectual information in narrative comprehension, and does L2 proficiency have an impact on this interaction?

Outline of the Study

As an attempt to provide a comprehensive answer to the research questions, the present thesis consists of the theoretical background which is necessary for understanding the experiment (Part I), and a description as well as discussion of the on-line reading experiment that has been carried out (Part II).

Part I comprises two broad topics. First, it introduces the reading model which is used in the present thesis, namely the *Event-Indexing Model* (e.g. Zwaan, Langston, & Graesser, 1995). The *Event-Indexing Model* is a current reading model in which the reading process is described as the construction of a situation model. However, in order to understand the *Event-Indexing Model* thoroughly, it is necessary to know about the theoretical context out of which it was developed. Thus, Chapter 1 starts out with a short historical overview of reading models which are relevant for the *Event-Indexing Model*. The overview is followed

by an in-depth description of the *Event-Indexing Model* itself. Finally, the most recent development within the field of reading comprehension is discussed.

In Chapter 2 the theoretical background on aspectuality is provided. Aspectuality is set against the conceptually close category of tense. Then the two dimensions of aspectuality, namely grammatical and lexical aspect, are explained. Their meaning is defined and their linguistic form is described for English and German respectively. Then, the L1 and L2 acquisition and processing of aspectuality are discussed.

In Part II the present empirical study is presented. So in Chapter 3 the research design is presented. It includes a presentation and explanation of the research questions, hypotheses and predictions, methods, participants, materials and procedures. In Chapter 4 the results of the pre-experiment are described, and in Chapter 5 the results of the experiment proper are described.

The thesis is concluded with a discussion, a summary of findings and suggestions for further research. Finally, in the Appendix, the instructions which were used in the present study are provided.

I THEORETICAL BACKGROUND

1 The Event-Indexing Model of Reading

The majority of research on the processing of aspectuality (see Chapter 2.2.2) has been carried out within a *Situation Model Framework* (e.g. van Dijk & Kintsch, 1983; Johnson-Laird, 1983). Within this framework narrative comprehension is seen as the mental process in which the events described in a text are coherently represented in the reader's mind. As has been pointed out by Clifton & Duffy (2001), the version of a *Situation Model* most frequently referred to is the *Event-Indexing Model* (Zwaan, Langston, & Graesser, 1995; Zwaan & Radvansky, 1998; Zwaan, Radvansky, Hilliard, & Curiel, 1998; Zwaan, 1999a). This model is also adopted in the present thesis. In what follows, the *Event-Indexing Model* will be explained in greater depth. First, the model will be embedded in its theoretical context. This will be followed by a detailed explanation of the model itself. Finally, new developments within the area of language comprehension and their relevance for the *Event-Indexing Model* will be pointed out.

1.1 Embedding the Event-Indexing Model

In order to fully understand the *Event-Indexing Model*, it is necessary to be aware of the theoretical field which gave rise to it. Therefore, a brief historical overview of the development of some relevant reading models will be given (see Figure 1 for an illustration) and finally their significance for the *Event-Indexing Model* will be pointed out.

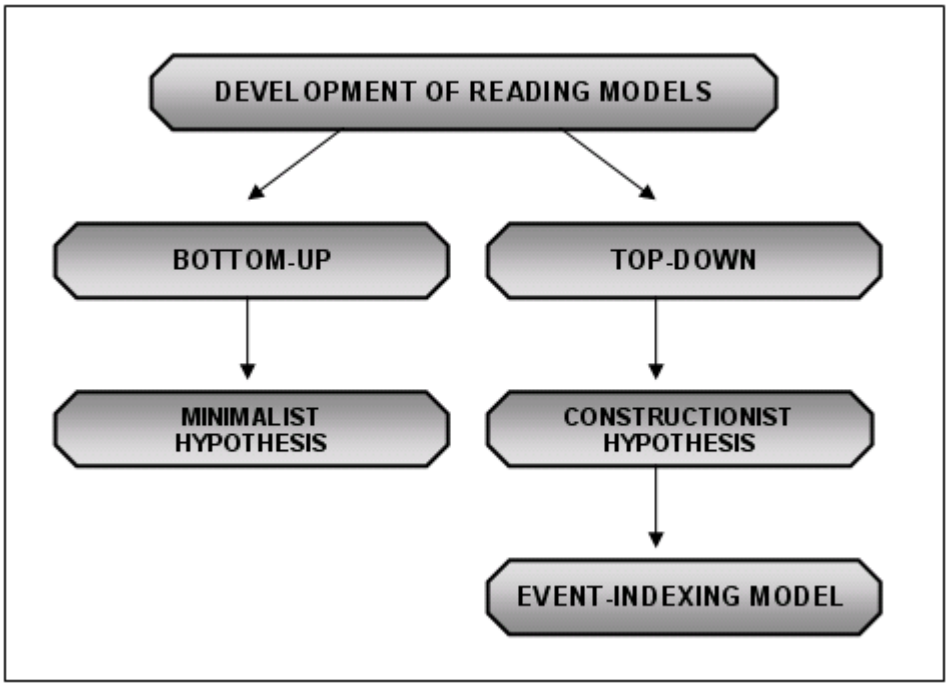


Figure 1: Development of Reading Models

Since the 1960s and 70s cognitive psychologists have tried to construct reading models which explain the processes that take place in the human mind during comprehension. From the onset of this endeavour two types of reading processes have been identified which till today remain fundamental in any discussion of reading and which, as will become evident later, keep dividing the reading research community. These two processes are widely referred to as *bottom-up* and *top-down*. The term **bottom-up** already suggests that the comprehension process starts with the decoding of printed text and sequentially progresses to the construction of meaning. As has been noted by Urquhart and Weir (1998, pp. 40-41), the bottom-up approach is most frequently attributed to Gough (1972). Briefly, Gough suggested that the reading process starts out with the recognition of letters. These are transformed into a string of phonemes which in turn enable recognition of the whole word. After reading the first word in this manner, the process is repeated until all words in a sentence have been identified. Then, syntactic and semantic rules are applied to create a meaningful sentence. As Gough's model was in fact a model of reading aloud (instead of silent reading), the final stage contains the oral articulation of the passage being read. As becomes evident from this description, knowledge stored in memory has no impact on the reading process within a bottom-up approach. Because no time consuming memory search is assumed in this model (neither for world knowledge nor contextual information), discourse processing is regarded as passive and very fast (Rayner & Pollatsek, 1989, p.25).

This initial formulation of the bottom-up approach has faced considerable critique. The dominant tenor of this critique is directed first towards the assumption of the sequential processor and second towards the lack of higher-level processes within the model. Concerning the idea of the sequential processor, Gough (1972) assumed that letters in a word are decoded one after the other, left to right. From this assumption it would follow that short words are read faster than long words. However, it has been shown that word length effects are small and that in fact letters are processed in parallel (e.g. Howard, 1991). Moreover, Gough (1972) suggested that the direction of sentence processing proceeds in a fixed manner from letters to words to sentences. But in fact numerous studies have shown the opposite effect. To give an example, Stanovich, Cunningham and Freeman (1984) found that words in coherent paragraphs are read faster than words in lists. “Thus it appears that 'higher level' information is being used in word recognition, which conflicts with the unidirectionality of the model” (Urquhart & Weir, 1998, p. 41). Concerning the second area of criticism, the lack of higher-level processes within the model, no explanation is given as to how sentences are integrated and inferences are drawn (Rayner & Pollatsek, 1989, p. 467). Moreover, the reader is regarded as passive and denied the capability of strategic reading (p. 467).

The **top-down** approach takes a different stance. As summarized in Rayner and Pollatsek (pp. 462-464) and Urquhart and Weir (pp. 42-44) top-down models break with the assumption that reading is a passive, precise and sequential process. Rather, reading is understood as an active, expectation-driven and selective process. The reader comes equipped with prior language and world knowledge which helps him/her to form hypotheses about what to expect next. Depending on the actual model, these hypotheses can relate to individual words, or even people, and events in the world (schemata). Based on these hypotheses and a pre-formed plan, the reader selects relevant text passages and so reduces the amount of time-consuming data processing.

The model most frequently associated with the top-down approach is the one proposed by Goodman (1967). According to Goodman the reading process begins with a visual fixation point on a sentence line. Then, reader specific strategies, his/her cognitive style, and prior knowledge as well as prior contextual information guide the selection of “graphic cues” (Goodman, 1967, p. 270 as cited in Geyer, 1972, p. 555). These are later transformed into a “perceptual image” (Goodman, p. 270 as cited in Geyer, p. 555) which consists of “partly what [the reader] sees and partly what [the reader] expected to see” (Goodman, p. 270 as cited in Geyer, p. 555). This image is checked against syntactic, semantic and phonological knowledge. This knowledge may be used to either enrich or reform the image. Now a “guess or tentative choice” (Goodman, p. 270 as cited in Geyer, p. 555) is

made as regards the word being read. The word is integrated with prior meaning and an expectation about the next piece of information is formed.

As with the bottom-up approach, the top-down model has also encountered thorough critique. As Urquhart and Weir (1998) pointed out, the thrust of criticism concerns the assumption that what distinguishes good readers from poor readers is their ability to make more guesses and to use more contextual information. In fact, however, studies have repeatedly shown that “while all readers use context, good readers are less dependent on it than poor ones” (p. 44). For example, Nicholson (1993) carried out a series of experiments in which he presented children with test words either in a list format or a story format. Results showed that poor and average readers pronounced more words correctly when they were embedded in a story, whereas good readers showed no main effect of text type (i.e. list vs. story). Rather, they profited from a practice effect, that is, they pronounced more words correctly when they were presented the test words a second time, no matter whether in a list or a story. This indicates that “less skilled readers rely on context to compensate for their poor decoding skills, whereas good readers do not need to do so, since they already have good decoding skills” (Nicholson, 1993, p. 102).

Although both, the bottom-up approach and the top-down approach, have faced substantial criticism, they have provided the basis for new and more refined models of reading. As has already been acknowledged by Guéraud and O'Brien (2005, p. 123), the bottom-up approach influenced the so-called *Minimalist Hypothesis* (McKoon & Ratcliff, 1992), while the top-down approach inspired much of the *Constructionist Hypothesis* (e.g. Graesser, Singer, & Trabasso, 1994). These hypotheses will now be discussed in greater detail.

The **Minimalist Hypothesis**, although influenced by the bottom-up view, was no longer focused on lower-order processes, such as word decoding. Instead, it was primarily concerned with how connections between sentences are made, more specifically, how additional information drawn from memory is brought to the text in order to connect sentences. This special type of connections is also called inferences. For an illustration, consider the following two examples discussed in McKoon and Ratcliff (1992, p. 442-444):

> *(1.1) A burglar surveyed the garage set back from the street. Several milk bottles were piled at the curb. The banker and her husband were on vacation. The criminal slipped away from the streetlamp. (Dell, McKoon, & Ratcliff, 1983, p. 123)*

> *(1.2) Mary stirred her coffee. (Dosher & Corbett, 1982, p. 531)*

In (1.1) the nominal anaphor *the criminal* has to be connected with its referent *a burglar* in order for the sentence to make sense. This inference is based on general knowledge, because the reader knows that *a burglar* is a type of *criminal*. According to the *Minimalist Hypothesis* such inferences are automatic; they are "encoded in the absence of special goals or strategies … and they are constructed in the first few hundred milliseconds of processing" (McKoon & Ratcliff, 1992, p. 441) and thus "without awareness" (p. 441).

In (1.2) however, proponents of the *Minimalist Hypothesis* claim that no automatic inference is drawn. Only when the reader is explicitly asked to guess the instrument used to stir coffee, does s/he infer *spoon*. Therefore, this kind of inference is called strategic; it is a conscious, "goal-directed" (p. 440) effort to solve a problem (p. 441).

The *Minimalist Hypothesis* is first and foremost interested in automatic inferences, as they "provide a minimalist representation of a text in memory from which strategic inferences can be constructed by retrieval operations" (p. 440). Automatic inferences are thus regarded as basic in the reading process, whereas strategic inferences can only be build upon a text representation in a secondary step.

The main assumption of the *Minimalist Hypothesis* about automatic inferences is that "inferences of only two kinds are constructed: those that establish locally coherent representations of the parts of a text that are processed concurrently and those that rely on information that is quickly and easily available" (p. 440). Inferences that create locally coherent representations are inferences which connect one or two sentences to make sense. Consider the following examples which were discussed by McKoon and Ratcliff:

> *(1.3) Rachel tried to catch Sally, but she was not able to do it.* (Corbett & Chang, 1983, p. 285)

> *(1.4) Once there was a girl named Betty. One day, she found that her mother's birthday was coming soon. Betty really wanted to give her mother a present. She went to the department store. She found that everything was too expensive. Betty could not buy anything for her mother. She felt sorry. Several days later, Betty saw her friend knitting. Betty was good at knitting too. She decided to knit a sweater.* (Trabasso, Suh, Payton, & Jain, 1995, p. 226)

In (1.3) the pronoun *she* has to be connected with the name *Rachel* in order for the sentence to make sense. Put simply, this inference is local, as it involves information which is not far apart and therefore in working memory at the same time. It is also drawn automatically (p. 443).

In (1.4) however, the *Minimalist Hypothesis* claims that the final sentence *She decided to knit a sweater* will not be automatically connected with Betty's overall goal of buying her mother a birthday-present. This is because the passage is locally coherent and no enriching information is needed for the minimal text representation (p. 445). As will become evident later, this assumption has been challenged in the *Constructionist Hypothesis* and subsequently also in the *Event-Indexing Model*.

The second kind of inferences, those that are based on 'quickly and easily available' information, were defined rather vaguely. They are assumed to be drawn on the basis of “well-known information from general knowledge and explicit information from the text” (p. 441). As such, causal inferences, like *Betty decided to knit a sweater because she wanted to give it to her mother as a present*, are predicted *not* to be drawn automatically; the goal information is too far away in the text for it to be quickly and easily available.

By differentiating between strategic and automatic inferences, the *Minimalist Hypothesis* has introduced an important distinction into reading comprehension research (Eysenck & Keane, 2010, 398). However, the model has also come under criticism. It is sometimes too minimalist and cannot account for some inferences which have been shown to be monitored during reading (O'Brien & Myers, 1999, p. 36). For instance, Albrecht and O'Brien (1993) carried out a reading time study in which they investigated global inference processes in locally coherent texts (Experiment 1). The authors presented their participants with short texts in which, for example, an eighty-one year old, hobbling character later on quickly runs to an injured boy in the street. Contrary to a minimalist prediction, the authors found that reading times on the inconsistent sentence (*He quickly ran and picked the boy up.*) were elevated, which suggests that readers had tried to establish a connection with previous text information (*hobbling*).

A different perspective offered to account for text comprehension and inference generation in particular, is the **Constructionist Hypothesis**. As has already been mentioned above, proponents of the *Constructionist Hypothesis* disagree with the *Minimalist Hypothesis*. According to them, reading is not a passive and automatic process, but rather active, goal-driven search-after-meaning (Gaesser, Singer, & Trabasso, 1994, p. 371).

The construction of meaning is assumed to be based on a three point program that the reader attempts to fulfil. First, “[the] reader constructs a meaning representation that addresses the reader's goals” (p. 371). This means that a reader will construct a meaningful text representation if s/he, for example, reads a novel for pleasure and seeks to understand characters' goals and motivations. However, if the reader only proof reads a text for spelling mistakes, s/he will not construct a meaningful text representation, because it is not his/her goal to comprehend the text.

Second, “[the] reader attempts to construct a meaning representation that is coherent at both local and global levels” (p. 371). This assumption entails that inferences about structurally close standing pieces of information will be drawn. As an example, remember sentence (2a) *Rachel tried to catch Sally, but she was not able to do it*. Moreover, this assumption includes inferences which relate local textual information to “higher order chunks” (p. 371). For instance, in sentence (1.4) Betty's going to the department store and her sweater knitting are expected to be connected with her overall goal of buying her mother a present. As such the *Constructionist Hypothesis* predicts higher inference generation than the *Minimalist Hypothesis*.

Third, and in line with the previous global coherence assumption, “[the] reader attempts to explain why actions, events, and states are mentioned in the text” (p. 372). This attempt includes causal inferences, which provide answers about why something happened. To give an example, consider the following two sentences as used in Singer, Halldorson, Lear and Andrusiak (1992, p. 507): *Mark poured the bucket of water on the bonfire. The bonfire went out*. Although it is not mentioned explicitly in the text, the reader makes use of his/her world knowledge and infers that the fire went out, because it was extinguished by water.

As has become evident, the *Constructionist Hypothesis* has significantly contributed to reading research. Proponents have stressed importance of top-down processes by an active reader who approaches a text with a certain goal that determines the reading outcome. What is more, the *Constructionist Hypothesis* has been able to account for a number of inferences which remained unexplained under the *Minimalist Hypothesis*. These inferences include global inferences, such as goal inferences and causal inferences. Importantly, these were also taken up in the *Event-Indexing Model* (Zwaan, Langston, & Graesser, 1995, p. 294) (see Chapter 2.1).

Nevertheless, the *Constructionist Hypothesis* has also been criticized. Research employing think-aloud protocols has shown that readers do not notice all potential connections (e.g. Suh & Trabasso, 1993). Thus, to construct a coherent textual representation, the reader does not need to draw all possible inferences. The *Constructionist Hypothesis*, however, does not make explicit which and how many inferences are necessary for a text to be accepted as coherent by an individual reader (Eysenck & Keane, 2010, pp. 397-398; O'Brien & Myers, 1999, p. 36).

Together, the bottom-up, minimalist approach and the top-down, constructionist approach have greatly advanced reading research. Nowadays, they are no longer seen as mutually exclusive. Rather, it has been acknowledged that they operate in concert during the reading process (e.g. van den Broek, Rapp, & Kendeou, 2005, pp. 303f.; Graesser, Millis,

& Zwaan, 1997, p. 183). Bottom-up processes dominate when a reader is satisfied with a moderately coherent representation of the text, when s/he has strained working memory resources, or when the text itself has a low global coherence. Top-down processes, on the other hand, dominate when a reader aims to build a strong coherent representation, when s/he can devote enough working memory capacity to the reading task, and when the text is globally coherent.

Still, although acknowledging the influence of both bottom-up as well as top-down processes, most reading models put an emphasis on one or the other. The *Event-Indexing Model*, for example, is mainly top-down oriented (Clifton & Duffy, 2001, p. 188). It assumes that reading comprehension involves the construction of multiple, also global, inferences. It will be discussed in the following chapter.

1.2 The Event-Indexing Model

Although the *Event-Indexing Model* was influenced by the Constructionist Hypothesis, the *Event-Indexing Model* has a broader scope. It is not pre-occupied with local inferences or a selection of global inferences. Rather, the *Event-Indexing Model* is concerned with coherent mental representations of the situations described in a text. In the remainder of this chapter the *Event-Indexing Model* will be explained in more detail. First, the notion of mental text representations will be explained. Then, the most complex mental text representation, the situation model, will be discussed in greater depth. Finally, L1 and L2 factors influencing a coherent situation model representation will be presented.

1.2.1 Three Levels of Mental Text Representations

As has been variously noted (e.g. Gaesser, Millis, & Zwaan, 1997, p. 167; Cook, Guéraud, Was, & O'Brien, 2007, p. 92), most *Situation Models*, including the *Event-Indexing Model*, follow van Dijk and Kintsch's (1983, 1998) model of how written text is mentally represented in the reader. Most basically, van Dijk and Kintsch distinguish three levels of text representations, the so-called surface representation, the propositional representation and the situtation representation. Put simply, these three mental representations can be compared to three different kinds of oral text representations: the quote, the summary, and the interpretation. The three mental representations will now be discussed in turn.

The **surface representation** is a literal representation of the text itself. It includes “some of the exact words and phrases” (Kintsch, 1998, p. 105) of the text. Thus, it enables the reader to reproduce a quote. However, it is remembered for only a short period of time, unless an effort is made to memorize it.

The **propositional representation** (also called **textbase**) is a semantic representation of the text. As such it enables the reader to give a faithful summary of a text. As the name suggests, it is made up of propositions, which "represent the meaning of a text" (Kintsch & van Dijk, 1978, p. 367). A proposition consists of a predicate (verbs, adjectives, connectives) and at least one argument (agent, object, goal). To illustrate a propositional representation, consider the following beginning of a story and its analysis, as suggested by Kintsch (1992, p. 148):

> *One day Mark and Sally were sailing their sailboat in the pond. Suddenly, the sailboat began to sink. Mark was surprised. He lifted the boat up with a stick …*

Proposition 1: AND [MARK, SALLY]
Proposition 2: SAIL [AND [MARK, SALLY], BOAT, POND]
Proposition 3: SUDDENLY [SINK [BOAT]]
Proposition 4: SINK [BOAT]
Proposition 5: SUPR [MARK, SINK [BOAT]]
Proposition 6: LIFT [MARK, BOAT, STICK]

As can be seen in the analysis above, the text representation consist of six propositions. These have various predicates, such as a connective (*and*), verbs (*sail*, *sink*, *lift*, *be surprised*), and an adjective (*suddenly*). The arguments are agents (*Mark*, *Sally*), objects (*boat*, *stick*), embedded propositions (*AND [MARK, SALLY], [SINK [BOAT]]*) and a location (*pond*).

Importantly, the analysis also shows that surface features are not represented in a propositional representation. Thus tense, aspect and mood are not coded. For example, *SAIL* does not specify past tense, progressive aspect, or indicative mood. The determinacy of the noun is likewise not indicated. So the distinction between, for example, *their sailboat* vs. *the sailboat* is not captured. Moreover, the analysis indicates that the propositional representation is directly derived from the text "without adding anything that is not explicitly specified" (Kintsch, 1998, p. 103).

However, authors hardly ever explicate every single detail. For example, in the narrative extract above, it is not mentioned about what and why Mark was surprised. As a result, the reader is faced with an information gap. These information gaps may lead to an "impoverished and often even incoherent" (p. 103) propositional representation. In order to gain a coherent understanding, a higher level textual representation has to be created; the situation representation.

The **situation representation** (also called **situation model** or mental model) is not only a representation of the text itself, but a fully fledged, coherent "representation of what the text is about" (Clifton & Duffy, 2001, p. 188). This complex representation necessarily includes information derived from the text as well as information provided by the reader's background knowledge and experience (Kintsch, 1992, p. 107; Zwaan, 1999, p. 96). Thus, it enables the reader to give a personal interpretation of a narrative.

1.2.2 The Level of the Situation Model

Within the *Even-Indexing Model*, reading comprehension is understood as the construction of a coherent situation model. Therefore, it is worthwhile elaborating on what the situation model is and how it is constructed.

The *Event-Indexing Model* builds on previous work by van Dijk and Kintsch (1983) and Johnson-Laird (1983) by assuming that the situation model is a "construction of a mental representation of what [a] text is about … not of the words, phrases, clauses, sentences and paragraphs of a text" (Zwaan, 1999b, p. 15). But the *Event-Indexing Model* takes these early definitions further. One of the most important assumptions within the *Event-Indexing Model* is that reading about events is similar to experiencing situations in everyday life. "In everyday life, we are typically aware of our location and time. We are also aware of people in our environment and their goals and emotions. And we are aware of objects that are relevant to our goals." (Zwaan, 1999b, p. 15). Adapting this to the reading process, readers puts themselves in the position of the protagonist. From this position they vicariously experience the narrated situation similar to an everyday life experience (see also Zwaan, 2004). That is, readers monitor the space and time of the story, the protagonist, other characters and objects, as well as goals and causal relations. These are also called the five situational dimensions, or indexes.

The coherent construction of a situation model thus heavily rests on the monitoring of the five dimensions. However, the construction is only gradual. Figure 2 is a simplified illustration of this construction process. Below a more in-depth description is given.

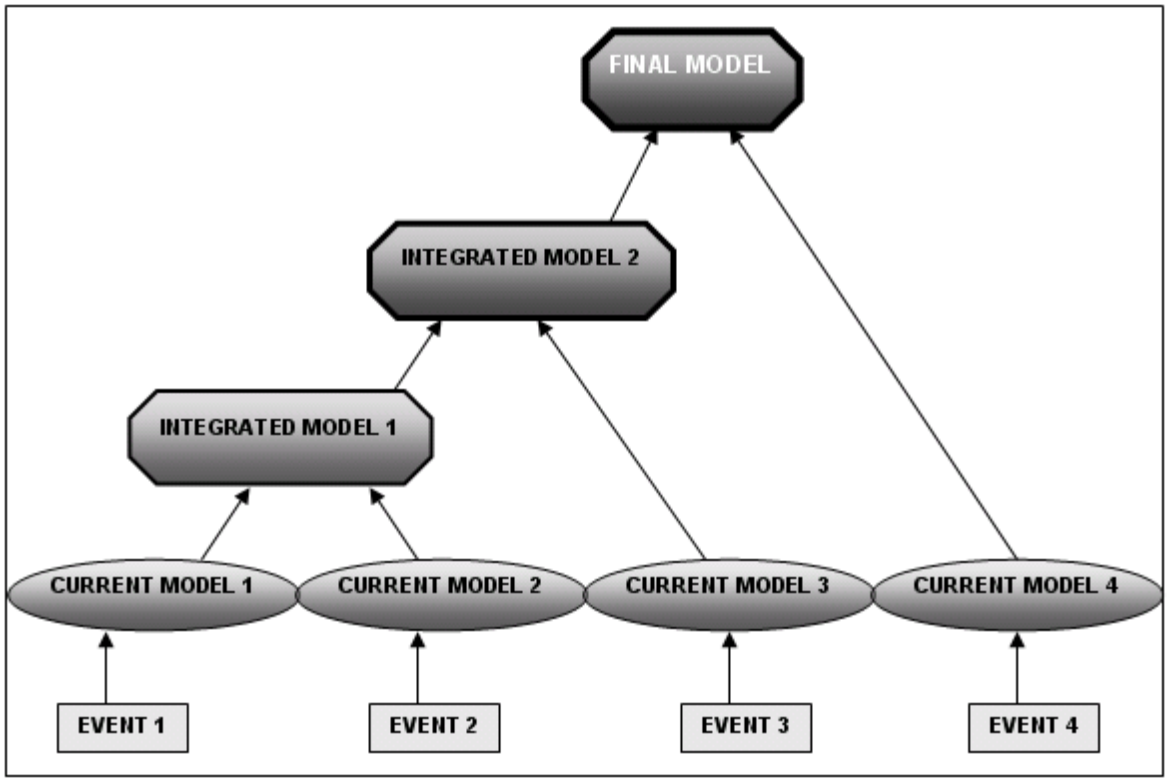


Figure 2: Stages in Constructing a Situation Model

As can be seen in Figure 2, readers start by dividing up (parsing) the text into the first **event** (Zwaan, 1999a, p. 95). Depending on the content and formulation in the text, the event may be described as singular, such as *Mark and Sally put a toy boat in the pond* or it may be described as a combination of multiple events, such as *Mark and Sally built a toy boat*. During the processing of the first parse/event, the reader constructs a situation model, more specifically, a so-called **current model** (Zwaan & Radvansky, 1998, p. 165).

To illustrate this process, remember the short extract about Mark and Sally above:

> *One day Mark and Sally were sailing their sailboat in the pond. Suddenly, the sailboat began to sink. Mark was surprised. He lifted the boat up with a stick …*

Here, the the first parse includes the event of 'Mark and Sally who are sailing their boat'. The event took place some day in the past. It is about two protagonists; a male person called Mark and a female person called Sally, who are next to a pond. Their motivation for being there as well as their goal coincide; they want to sail their boat. All dimensions are made explicit in the text. Therefore, the reader does not have to add any dimensional information.

When the reader progresses to the next event, a second current model is created. The two models are combined along the five dimensions and a new, more “global” (p. 165)

situation model is created. It is called the **integrated model**. In the Mark and Sally extract above, the second parse includes the event of the sailboat that is sinking. The integrated model remains continuous on the temporal and spatial dimensions. That is, the event occurs “in the same time frame” (Zwaan, Langston, & Graesser, 1995, p. 294) and “within the same spatial region” (p. 294). However, there is a shift on the protagonist dimension. Mark and Sally are no longer in the focus of attention. Rather, their sailboat becomes the new central element, functioning as the new protagonist. The reason for the boat's sinking remains as yet unclear. However, it is causally unrelated to any prior event and so the reader is left in suspense.

After repeating the construction and integration process with all the available events, the reader finally arrives at a complete representation of the text, the so-called **complete model**. It is “the model that is stored in long-term memory after all the textual input has been processed” (Zwaan & Radvansky, 1998, p. 166).

1.2.2.1 Foregrounding/Backgrounding in the Situation Model

As has been described above, during the comprehension process the reader constructs an integrated situation model which represents events – including actions, states, people, objects, goals, causal relations, locations and time – that are described in a text or inferred by the reader. Importantly, the evolving situation model is continually updated as new actions happen, new characters enter the scene, new locations are visited, etc. As the reader only has a limited amount of cognitive processing resources available, some of the old information contained in the integrated model can no longer be kept active in short term working memory (STWM). The question arises which information is kept accessible in the integrated model, that is, which information is foregrounded, and which information becomes less accessible, that is, backgrounded?

The decision about which information is foregrounded and which information is backgrounded, is based on the above mentioned role of the reader as a vicarious experiencer of the narrated situation, who puts himself/herself into the position of the protagonist. From this position the reader judges which information to foreground/ background, that is, which information to make more accessible or less accessible: “information that is currently relevant to the protagonist … is more accessible [to the reader] than information that does not meet these criteria” (Zwaan & Madden, 2004, p. 283).

While it seems convincing that information that is currently relevant for the protagonist is foregrounded, while less accessible information is backgrounded, it is still unclear what

exactly constitutes relevant or irrelevant information. Somewhat vaguely, it has been suggested that background knowledge enables the reader to make this decision and that linguistic cues (e.g. word order, grammatical aspect, etc.) also help the reader to distinguish between relevant and less relevant information (Zwaan & Radvansky, 1998, p. 167).

In order to illustrate the process of foregrounding/ backgrounding, a selective summary of studies investigating foregrounding/ backgrounding along the situational dimensions of time, space, causation, goal, protagonist and object will now be provided.

Within the dimension of **time**, which, broadly speaking, is also the topic of the current research question, foregrounding/ backgrounding effects have been found (see also Chapter 2.2.2 specifically on the processing of aspectuality). In accordance with the idea of 'current relevance', Zwaan (1996) discovered that events that just happened are foregrounded whereas events that happened some time ago are backgrounded. In a series of experiments, the author presented his participants with short stories which included a critical sentence with a temporal adverbial, such as: *Jamie turned on his PC and started typing. A moment later/ An hour later/ A day later, the telephone rang.* Reaction times for the probe word *typing* were faster when the two events were within the same temporal time frame (*a moment later*) than when they were in two different time frames (*a day later*).

Along the dimension of **space**, foregrounding/ backgrounding effects have also been noted. Within a situation “objects that are spatially close to us are more relevant than more distant objects” (Zwaan, 1999b, p. 15). A number of studies have empirically verified this assumption (e.g. Glenberg, Meyer, & Lindem, 1987; Radvansky & Copeland, 2001; Cook, Guéraud, Was, & O' Brien, 2007). For example, Glenberg et al. presented participants with short stories containing a critical object, such as a *sweatshirt*. In one condition the critical object was spatially associated with the protagonist (e.g. H*e put on his sweatshirt before going jogging*.), and in another condition the critical object was spatially dissociated with the protagonist (e.g. H*e took off his sweatshirt before going jogging*.). One or two sentences after the critical sentence had been presented, participants were shown the critical object again and had to decide whether it had been mentioned before, or not. Results showed that participants' responses were faster in the associated condition than in the dissociated condition. From this it can be concluded that “in the associated condition the speeded reaction to the target object reflects heightened activation of the token in the foreground” (Glenberg et al., 1987, p. 76).

Concerning the dimension of **causation**, only little is known about what precisely causal relations are (Guha, 2006) and therefore even less can be said about general

foregrounding/ backgrounding processes of causal information. However, some studies have investigated a specific aspect of causal relation foregrounding/ backgrounding, namely the significance of linguistic cues within that process (Millis & Just, 1994; Deaton & Gernsbacher in press). For example, Deaton and Gernsbacher (Experiment 1) investigated the influence of the causal connective *because* as well as the noncausal connectives *and* or *then*. The authors found that two events were read more quickly when they were connected with *because* (e.g. *Susan called the doctor for help because the baby cried in his playpen*.), and more slowly when they were connected by *and* (e.g. *Susan called the doctor for help and the baby cried in his playpen*.) or *then* (e.g. *Susan called the doctor for help then the baby cried in his playpen*.). As suggested by Zwaan and Radvansky (1999, p. 171) this result can be taken as evidence that causal connectives increase the foregrounding of causally related events.

Also with regard to the **goal** dimension foregrounding/ backgrounding effects have been found. It has been shown that failed or unsatisfied goals are foregrounded. Satisfied goals, on the other hand, are backgrounded. For example, Lutz and Radvansky (1997) presented their participants with short stories which included critical goal information, such as *Betty wanted to buy her mother a birthday present*. The stories came in two versions; a failed goal version (e.g. *She found that everything was too expensive. She could not buy anything for her mother*.) and a satisfied goal version (e.g. *She found a pretty purse. She bought her mother the purse*.). Additionally, the authors included a neutral story version. Results showed that reactions to probe questions (e.g. *Had Betty wanted to get her mother a birthday present?*) were fastest for the failed condition, followed by the satisfied and then the neutral condition. This suggests that failed goal information is foregrounded, whereas completed goal information is backgrounded.

Finally, as regards the **protagonist** and **object** dimensions. Protagonists and objects are particularly important in narratives and they "form the "meat" of situation models" (Zwaan & Radvansky, 1999, p. 173). Thus, it is not surprising that protagonists are foregrounded in the reader's mental representation. Evidence for this mainly comes from pronoun resolution studies (for a review see Zwaan & Radvansky, 1999, p. 174). In these studies the main characters were textually foregrounded by being mentioned first, by their name or grammatical status. As a result, anaphoric references were read faster. Interestingly, readers also foreground protagonists' traits. For example, Albrecht and O'Brien (1993) presented their participants with either of three story versions that included a short description of the main character, such as (1) *Mary, a health nut, has been a strict vegetarian for 10 years*, or (2) *Mary enjoyed eating anything that was quick and easy to fix*, or (3) *Mary frequently ate at the restaurant*. Several sentences later, the reader was

presented a critical sentence depicting an action (e.g. *Mary ordered a cheeseburger and fries*.). Depending on the previous character description, this action was either (1) inconsistent, or (2) consistent, or (3) neutral with regard to the previously mentioned character trait. Albrecht and O'Brien noted that reading times for the critical sentence were longer for actions which were inconsistent with a character description. This suggests that protagonist traits are foregrounded in the evolving situation model.

In contrast to protagonists, objects, are not routinely foregrounded (e.g. Gaesser, Singer, & Trabasso, 1994). However, they may be perceived as relevant under certain circumstances, which “are as yet not very well understood” (Zwaan & Radvansky, 1999, p. 174). It is assumed that, potentially, objects that are causally important to the story are foregrounded. These are likely to be mentioned explicitly in a text and indeed it has been shown that explicitly mentioned object instruments are foregrounded (p. 174).

1.2.3 Factors Influencing Situation Model Construction in L1 & L2

As has been described above, situation model construction is a higher-level process and much more complex than lower-level processes, such as word decoding. Therefore, multiple factors can potentially influence the construction of a coherent situation model.

Zwaan and Brown (1996, p. 290) noted that the factors influencing situation model construction can be divided into two categories; reader-associated factors and text-associated factors. Reader-associated factors include L1 and L2 comprehension skill, language fluency, background knowledge, motivation and goals. These factors can either enhance or inhibit situation model construction. For example, a reader who has a low L2 language fluency will have a strained working memory and thus struggle to construct a coherent situation model. However, when the reader has high L1 comprehension skills, a rich background knowledge on the topic, and is motivated to understand the gist of the text, s/he will develop a richer and more coherent situation representation.

In addition to reader-associated factors, text-associated factors have been noted. These include text genre, structure and style. For example, Zwaan (1994) noted that expectations about text genre (which always include expectations about text structure and style) influence readers' situation model construction as well as final memory representation. Thus, the expectation of reading a literary passage leads readers to rather concentrate on surface features of the text, whereas the expectation of reading a news article passage guides readers to concentrate on the content, and to form a coherent situation model.

1.2.4 Evaluation

The *Event-Indexing Model* has greatly advanced reading research in that it has "identifie[d] key processes involved in creating and updating situational models" (Eysenck & Keane, 2010, p. 411). That is, it has demonstrated which information readers keep track of during the reading process (protagonist/object, time, place, causality, goal), and how this information is interactively monitored. Moreover, the model identifies which information is foregrounded and progressively taken over to the evolving situation model, or backgrounded.

However, this "focus of the event-indexing model is at a fairly general level" (Eysenck & Keane, 2010, p. 412). As Zwaan himself noted, the *Event-Indexing Model* does not go "inside" (Zwaan, 2008, p. 15) the mental representation and offers no answer as to its "proper representational format" (Zwaan, 1999b, p. 17). That is, the model gives no answer as to whether mental representations draw on perceptual representations and, for instance, take the form of an image, or whether mental representations are non-perceptual, and, for instance, take the form of lists. This question has long been an issue of debate. Since the introduction of the situation model by van Dijk and Kintsch (1983) and Johnson-Laird (1983) only tentative answers have been provided. A new promising approach to this issue is provided by the *Mental Simulation Model* (e.g. Barsalou, 1999). It will be discussed in more depth in the following chapter.

1.3 New Perspective: The Mental Simulation Approach

Within the last few years a new perspective within the field of language comprehension has been adopted. This new perspective was influenced by more general theories of knowledge, such as put forward by Barsalou (1999). Barsalou has a "biologically oriented" (Zwaan 1999b, p. 17) approach to language. One of his fundamental assumptions is that language is part of cognition. Importantly, however, language is not seen as an isolated part of cognition, but rather it is seen as being integrated with other cognitive sub-systems, most notably the sensory system (audition, olfaction, somatosensation, vision, haptics, gustation) and the motor system (movement).

Applied to reading comprehension, the *Mental Simulation Approach* offers a "specific" (Eysenck & Keane, 2010, p. 412) focus. It goes "inside" (Zwaan, 2008, p. 15) the mental representation and makes an explicit assumption about the representational format of mental representations. According to the *Mental Simulation Approach*, comprehension is tightly connected to perception. That is, perceptual memory is activated during the comprehension process. The memory of, for example, seeing an object (e.g. a cup) or

performing an action (e.g. pounding a nail), is re-activated (simulated) in the sensory-motor brain areas which were involved in the visual and motor experience. Thus, language comprehension can be seen as a mental, perceptual simulation of the described object or action (Barsalou, 1999, p. 605; Bergen & Wheeler, 2010, p. 150; Knoeferle, Crocker, & Pulvermüller, 2010, p. 137).

Evidence for mental simulations in language comprehension mainly comes from neuroimaging studies (e.g. functional magnetic resonance imaging (fMRI), electroencephalography (EEG)). The majority of these has concentrated on the word or sentence level (Knoeferle et al., 2010, p. 138). For example, it has been shown that reading names of tools activates brain areas associated with action and motion of inanimate objects (Chao, Haxby, & Martin, 1999). Likewise, reading sentences including a motor action, such as a hand movement (e.g. ital. *Afferro il coltelllo* 'I grasp a knife'), activates parts of the motor strip involved in actually carrying out hand movements (Tettamanti et al., 2005).

Although the *Mental Simulation Approach* offers a new, exciting understanding of language comprehension which is based on strong biological evidence, it is as yet unclear in how far the model can be applied to story processing.

Most importantly, at present there exists no comprehensive simulation model of reading. Therefore, it is unclear how longer units of narrative text simulate mental representations. For example, it is still a matter of debate at which time-point the sensory-motor system is activated (Zwaan, Taylor, & de Boer, 2010, p. 148). Is it activated when the reader encounters a verb, or is it activated above the verb level?

Furthermore, the *Mental Simulation Approach* offers a convincing account of how content words activate the sensory-motor system, however, it is as yet unclear how grammatical structures might simulate sensory-motor resonance. Taking the expression of time as an example, Evans (2008) points out that temporal experiences, as encoded by grammatical aspect or tense (e.g. duration, instantaneity, sequentiality, etc.) are different from sensory-motor experiences. Presently, it is therefore not clear how tense and aspect markers could help in the construction of mental simulations, and if they do, which function they take within the construction process.

Finally, it is difficult to see how some typical thematic and stylistic features of narratives can activate the sensory-motor system. For example, narratives frequently explore abstract meanings, such as freedom or love. However, it is an open question how these activate the sensory-motor system (Eysenck & Keane, 2010, p. 413). Likewise, metaphorical language is an important stylistic device in narratives. However,

neuroimaging studies have shown that metaphorical expressions (e.g. *grasping the idea*) do not activate the same sensory-motor areas as their non-metaphorical counterparts (e.g. grasping the scissors) (Aziz-Zadeh, Wilson, & Iacoboni, 2006, p. 1819).

In short, the *Mental Simulation Approach* offers a new, interesting perspective on language comprehension. However, more theoretical and empirical research is necessary before it can be comprehensively applied to model the reading process.

2 Aspectuality

After having presented the *Event-Indexing Model of Reading*, which is adopted in the present thesis, the linguistic phenomenon which is investigated within this framework will now be presented: aspectuality. To this end, the theoretical background on aspectuality as well as empirical research on the acquisition and processing of aspectuality will be presented.

2.1 Theoretical Background on Aspectuality

In order to gain an understanding of the task L1 German learners of L2 English are faced with when processing aspectual meaning, the theoretical background on aspectuality has to be considered. Therefore, a theoretical overview of aspectuality will be provided. The overview will first include a definition of aspectuality in contrast to tense, which is a conceptually close category. Then, the sub-types of aspectuality as seen in a bidimensional approach (see Sasse, 2001), namely grammatical and lexical aspect, will be discussed; a general explanation of their meaning will be provided, followed by a description of the language-specific realization of each sub-type.

2.1.1 Aspectuality vs. Tense

In general, aspectuality concerns the "internal temporal structure of states of affairs" (Boogaart, 2004, p. 1165) and is thus to be distinguished from the concept of tense, which concerns the "external relationship between a state of affairs and the deictic center of the discourse" (p. 1165). The following examples (taken out of Boogaart, 2004, p. 1165) shall illustrate this difference:

(2.1) He was dead.

(2.2) He died.

In (2.1) and (2.2) both verbs express past tense. However, they differ in their internal temporal duration. Whereas (2.1) describes a durative state, (2.2) describes a punctual change of state. Thus, the two sentences are identical with respect to tense, but differ with respect to their aspectuality. More precisely, they differ in *lexical aspect* (see Chapter 2.1.2 for a more detailed discussion of lexical aspect).

Another distinction between aspectuality and tense is captured in the following example (taken out of Andersen, 1991, p. 307):

(2.3) We played a great game.

(2.4) We were playing a tie-breaker when my racket broke.

Again, in (2.3) and (2.4) both main verbs indicate past tense, as the narrated event occurred prior to the point of speech. However, the main verbs differ with respect to their boundedness or viewing frame. Whereas in (2.3) the activity is seen in its totality with a beginning and an end, in (2.4) the activity is seen in its progression and its boundaries are not focused on. Thus, it can be said that the two sentences share the same tense, namely past tense, but differ in aspect, more specifically, in *grammatical aspect* (see Chapter 2.1.3 for a more elaborate discussion of grammatical aspect). This semantic distinction between grammatical aspect and tense is important, because these linguistic categories may share the same form (Boogaart, 2004, p. 1175). For example, in English the marker *-ed* can indicate past tense and bounded, perfective aspect.

2.1.2 Lexical Aspect

The concept of lexical aspect has been variously termed, including situation aspect, Aktionsart, actionality, verb aspect, verb character, intrinsic verb meaning or Aristetolian aspect (Boogaart, 2004, p. 168). In order to explain lexical aspect one can start by describing its semantics or form

2.1.2.1 Semantics of Lexical Aspect

Semantically, lexical aspect is “used to refer to a typology of states of affairs” (Boogaart, 2004, p. 1165). The most influential typology has been proposed by Vendler (1957) (see Table 2.1.1). It has both been taken up in acquisition research (for L1 English see e.g. Li & Shirai, 2000; for L1 German see e.g. Freiberger, 2008; for L2 English see e.g. Andersen, 1991 or Bardovi-Harlig & Reynolds, 1995) and processing research (for L1 English see e.g. Magliano & Schleich 2000; for L2 English see Slabakova & Montrul, 2002).

Lexical Aspectual Categories				
Features	*States*	*Activities*	*Accomplishments*	*Achievements*
punctual	−	−	−	+
telic	−	−	+	+
dynamic	−	+	+	+

Table 2.1: Lexical Aspectual Categories from Bardovi-Harlig & Reynolds (1995)

As can be seen in Table 2.1, four predicate classes are distinguished; states, activities, accomplishments, and achievements. The distinction is based on three semantic characteristics, namely the binary opposition between punctual/durative, telic/atelic, and dynamic/stative. First, a punctual event "lacks temporal duration – its begin point and endpoint coincide" (Boogaart, 2004, p. 1169). Consider, for example, the difference between *know geography* and *reach the hilltop*. The former lasts for a certain period of time (conceivably a span of many years), whereas the latter involves nearly no duration at all. Second, a telic event makes "explicit reference to the endpoint of the state of affairs" (p. 1168). For example, *write a letter* includes an endpoint. The activity of writing will be over when the writer has nothing more to say and the letter is finished. However, *push a cart* has no natural endpoint. It is not an activity which can be finished. It can solely be stopped. Finally, a dynamic event "involve[s] change from one moment to the next" (p. 1168). As such *running* can be described as a dynamic event. It consist of successive changes in motion including the lifting of a leg and its dropping. On the other hand *believe in the stork* involves no change.[1]

2.1.2.2 Form of Lexical Aspect

Concerning formal criteria, lexical aspect has been traditionally defined as "a lexical property of, most notably, verbs" (p. 1166) which can be expressed by derivation (Sasse, 2001, p. 7). Thus, it is usually set in opposition to grammatical aspect, which is frequently expressed via inflection. However, in recent approaches to aspectuality, lexical aspect is "no longer regarded as something exclusively confined to verb lexemes; it is variously described as a property of lexical verbs, of verb phrases …, of propositions, or of sentences." (pp. 7f.). From this it follows that derivation becomes only one process that influences lexical aspect and that it is not dependent on formal marking. Below, these processes are described for English and German respectively.

1 All examples are taken from Vendler (1957).

English

As has been noted above, lexical aspect is compositional. Linguistic constructions influencing lexical aspect are aspectual particles, and object definiteness.

First, **aspectual particles** (e.g. *down*, *up*) change a verb's lexical aspect. Usually, they are used to change durative, atelic verbs into telic verbs (Comrie, 1976, p. 46; Boogart, 2004, p. 1171). Examples include *eat* vs. *eat up*, or *write* vs. *write down*.[2]

However, it has to be stressed that aspectual particles alone do not determine lexical aspect (Comrie, 1976, p. 44; Boogaart, 2004, p. 1172). Other elements, can override their telic feature. Consider the following example: *He wrote down the number* vs. *He wrote down numbers*. Here, **object definiteness** impacts lexical aspectual meaning. Whereas a direct object (*the number*) indicates a specific telic event, a plural object (*numbers*) suggests an atelic, maybe even iterative activity.

German

As has already been noted above, lexical aspect is compositional. While in English aspectual particles can be used to change a verb's lexical aspect, in German prefixation can be used. Also, object definiteness plays a role in determining lexical aspect.

Regarding **prefixation**, affixes, such as *ver-* , *er-* , *auf-, hin-* etc., can be added to the beginning of a verb. In this case, the word class stays the same, but the verbal meaning is changed from [+durative] and [+atelic] to [+telic]. Examples include: *blühen* ('to bloom') – *verblühen* ('to wither'), *frieren* ('to be cold') – *erfrieren* ('to freeze to death'), *stehen* ('to stand') – *aufstehen* ('to stand up'), or *gehen* ('to walk') – ***hin****gehen* ('to go there'), (Eichinger, 2004, pp. 135-137; Schmiedtová, 2004, p. 72; p. 138-140; Zifonun, Hoffmann, Strecker, & Ballweg, 1997, p. 1861).

In addition, **object definiteness** is integral for understanding lexical aspect. As in English, a countable, and/or direct object invites a telic reading (e.g. *Hans aß das/drei Wurstbrötchen*. 'Hans ate the/three sausage sandwich/es.', whereas a plural object or an uncountable object renders an atelic reading (e.g. *Hans aß Wurstbrötchen*. 'Hans ate sausage sandwiches.', *Hans spielte Klavier*. 'Hans played piano.') (Ballweg, 2004, p. 77; Egg, 2004, p. 104).

2 Note that prefixed verbs and particles in Germanic languages, such as English and German, have also been analysed as having perfective meaning (e.g. Comrie, 1976, p. 90, Brinton, 1988, pp. 163-184). This is probably due to the similar meaning of telic and perfective.

2.1.3 Grammatical Aspect

Grammatical aspect too has been variously termed, for instance, viewpoint, viewpoint aspect, perspective point, aspect proper, or simply aspect (Sasse, 2001, p. 6). In parallel to lexical aspect, grammatical aspect can also be explained with reference to is semantics or form.

2.1.3.1 Semantics of Grammatical Aspect

Semantically, grammatical aspect has been explained using two concepts: viewpoint and boundedness. From a viewpoint explanation, grammatical aspect "indicates whether a state of affairs is seen either from an external viewpoint, as completed …, or from an internal viewpoint, as ongoing" (Boogaart, 2004, p. 1166). However, more recent approaches make use of the boundedness explanation (Sasse, 2001, p. 8), where grammatical aspect indicates "whether or not a situation is described as having reached a temporal boundary" (Depraetere, 1995, pp. 2f.). These two explanations have also been merged (e.g. Radden & Dirven, 2007).

The two major grammatical aspects are perfective and imperfective aspect (Brinton, 1988, p. 52; Langacker, 1987, p. 78). **Perfective aspect**, as defined from a viewpoint approach, "looks at the situation from outside without necessarily distinguishing any of the internal structure of the situation" (Comrie, 1976, p. 4). From a boundedness approach, it has been described as "bounded within the immediate temporal scope" (Langacker, 2001, p. 257). For **imperfective aspect**, on the other hand, the viewpoint is a different one, as imperfective aspect "looks at the situation from inside, and as such is crucially concerned with the internal structure of the situation" (Comrie, 1976, p. 4). Likewise, the temporal scope is different, as imperfective aspect "profiles a process *not* specifically construed as being bounded" (Langacker, 2001, p. 257). Consider the following examples (discussed in Radden & Dirven, 2007, p. 177):

> *(2.5) Ann cuddled the baby.* (p. 177)
>
> *(2.6) Ann lives with her parents.* (p. 177)

In (2.5) the event is described in perfective aspect. It is viewed externally, as a whole with a beginning and an end. In (2.6) on the other hand, the event is described in the imperfective aspect. It is not viewed externally, because no reference is made to its temporal boundaries. It is an indefinitely lasting state.

Another important grammatical aspect, especially for English, is **progressive aspect**. It has been described as a sub-category of the imperfective aspect (Comrie, 1976, p. 25) and it has an “unusually wide range” (p. 33). Importantly, the meaning of progressive aspect interacts with the predicate's lexical aspect. The following examples (again discussed in Radden & Dirven, 2007) shall illustrate its use.

(2.7) Ann is cuddling the baby. (p. 178)

In (2.7) progressive aspect describes the activity of *cuddling* from a restricted, internal viewpoint. That is, the focus only lies on the progression of the activity (p. 181). The beginning (Ann opens her arms and picks up the baby) and the end (Ann slowly releases the hug and sets down the baby) are not in focus. Moreover, the event is unbounded; no temporal boundaries are grammatically marked.

(2.8) I was laying the table. (p. 184)

Similarly, in (2.8) progressive aspect imposes an internal viewpoint and an unbounded reading. Here, the accomplishment of *laying the table* is described with a focus on its “durational phase” (p. 181). The inherent end-point (the table is fully laid with all necessary plates, forks, knives, spoons, glasses, napkins, etc.) is not in focus and what is more, the inherent end-point might never be reached. Consider the following sentence: *I was laying the table when my boss called and then I had to spend the whole evening in the office* (p. 190). This is also called the imperfective paradox; *I was laying the table* does not entail *I have laid the table*.

(2.9) Jennifer was reaching the finish. (p. 189)

In (2.9) progressive aspect is used with an achievement (*reaching the finish*). Achievements are of short duration and contain an inherent end-point. Progressive aspect focuses the reader on the internal “build-up phase”(p. 181) to this end-point. However, as with (2.8), the end-point does not necessarily have to occur. One could imagine an unfortunate ending such as: *Jennifer was (just) reaching the finish when she slipped* (p. 189).

(2.10) I am feeling sick. (p. 192)

Finally, in (2.10) a state is described (*be sick*). Progressive aspect imposes an internal viewpoint which "makes us see the states as heterogeneous, specific and episodic" (p. 192). Thus, the feeling of sickness is understood as describing a temporary feeling at the time of utterance, and not describing a habitual, everlasting feeling.

2.1.3.2 Form of Grammatical Aspect

Concerning its form, grammatical aspect is primarily defined as a morphological phenomenon, being expressed via inflections (Boogart, 2004, p. 1166). However, there is a trend in the recent literature on aspectuality to deemphasise the importance of overt marking and to acknowledge the influence of context (Sasse, 2001, p. 8). In what follows, the formal, language-specific realizations of grammatical aspect will be described for English and German respectively.

English

Grammatical aspect is not a dominant linguistic category in English. Rather, English is frequently described as a tense-dominant language in acquisition studies (e.g. Housen, 1993, p. 203; Lantolf, 2005, p. 347, but see Haspelmath, Dryer, Gil, & Comrie, 2005, p. 270 for a critique of such a typology). Nevertheless, grammatical aspect is expressed by a variety of linguistic means in English, including morphological marking (Comrie, 1976, p. 87), and syntactic expressions (pp. 98f.)

Concerning **morphological marking**, grammatical aspect can be marked using two constructions. First, the auxiliary *be+ing* (e.g. *Vanessa was eating a delicious chocolate cake*.) can be used to indicate progressive meaning. It is frequently regarded as "the clearest, sometimes the only" (Brinton, 1988, p. 7) form of grammatical aspect. Second, the auxiliary *have+ed/en* (e.g. *Vanessa has eaten a delicious chocolate cake*.) expressing perfective meaning has also been identified as a formal marker of grammatical aspect (e.g. Comrie, 1976, p. 124; Brinton, 1988, p. 4). However, not all scholars agree that the perfect expresses aspectual meaning (e.g. Anderson, 1973, p. 85; McCoard, 1978, pp. 151-153 as cited in Brinton, 1988, p. 13, p.15).

In addition to these clear markers of grammatical aspect, the **simple form** has also been discussed as a possible marker of grammatical aspect. The present simple (e.g. *Mary enjoys her work*.) is frequently considered as conveying imperfective aspect (e.g. Radden & Dirven, 2007, p. 178; Boogart, 2004, p. 1175; Langacker, 1987, p. 79). The past simple (e.g. *In two days, he created a plan*.), on the other hand, is frequently described as conveying perfective aspect (e.g. Brinton, 1988, p. 16).

Moreover, **syntactic expressions** are also part of the linguistic repertoire to expresses grammatical aspect (Comrie, 1976, p. 99). In English, only locative expressions (*at*, *in*) are used. They occur in progressive constructions; either as paraphrases, such as in the admittedly dated *He is at/in work(ing)* vs. *He is working*, or as "[a]n even fuller expression of progressive meaning" (p. 99), as in *He is in the process of getting up* vs. *He is getting up.* Importantly, syntactic expressions are also a means of expressing grammatical aspect in German (see Chapter 2.1.1.2 below).

German

In German too grammatical aspect is not a dominant category. Therefore, it is likewise described as a tense-dominant language (Noyau, 2002, p. 113). In fact, grammatical aspect is not even marked morphologically (Andersson, 2004). Therefore, researchers disagree about the legitimacy of using this category for German. Nevertheless, it has to be acknowledged that German offers a variety of linguistic means with which the semantic concept of (grammatical) aspect can be expressed. These include tense, the linguistic co-text, lexical aspect, lexical means (temporal adverbials, connectives), and syntactic means (prepositional constructions). Importantly, these operate in combination.

The role of **tense** as an indicator for grammatical aspect is widely controversial. As Andersson (2004) and Klein (2000) point out, *Präsens* (present tense), as in *öffnet* ('opens'), and *Präteritum* (preterite), as in *öffnete* ('opened'), were traditionally described as being imperfective (e.g. Flämig, 1971 as cited in Andersson, 2004, p. 8).

However, this assumption has been criticized lately, as the importance of the **co-text** is being acknowledged. For the *Präsens* and *Präteritum* consider the following examples discussed in Andersson (2004, p. 9):

> *(2.11) Er öffnete die Türe*. ('He opened/was opening the door')
>
> *(2.12) Er öffnete die Tür und trat heraus*. ('He opened the door and stepped outside.')

In (2.11) where no contextual information is provided, both aspectual meanings are initially available. Therefore, *öffnete* can be translated as 'was opening'. Although not mentioned by Andersson, one could imagine the following scenario: *Er öffnete die Türe, ganz langsam, Millimeter für Millimeter. Er musste vorsichtig sein, um nicht den schlafenden Hund zu wecken. Seine Hand schwitzte auf der Türschnalle. Er wusste: Eine zu rasche Bewegung und alles wäre vorbei*. ('He was opening the door, very slowly, millimetre by

millimetre. He had to be careful not to wake the sleeping dog. His palm was sweating on the doorknob. He knew: a too rapid movement and everything would be over.'). On the other hand, *öffnete* can be translated as 'opened'. In (2.12) the appropriate context for this reading is provided. Here, the act of opening the door is immediately completed by the following action of stepping outside. Thus, it is bounded and viewed externally.

Perfekt (perfect), such as *hat gearbeitet*, and *Plusquamperfekt* (pluperfect), such as *hatten abgerissen*, on the other hand, were traditionally described as perfective (e.g. Flämig, 1971). For the *Perfekt* consider the following examples given by Klein (2000, p. 358):

> *(2.13) Peter hat gearbeitet und ist müde*. ('Peter has worked and is tired.')
>
> *(2.14) Peter hat gearbeitet und wollte nicht gestört werden*. ('Peter was working and did not want to be disturbed.)

Here, the importance of context becomes evident once again. The translations clearly show, that in (2.13) *Perfekt* can be used to express perfective meaning; the activity of working has stopped, hence it is bounded. Moreover, the activity of working is not seen in its internal progression. Therefore, it is viewed externally. However, in (2.14) the use of the *Perfekt* expresses imperfective aspect; the activity of working is not over within story time and therefore unbounded. What is more, the activity is described in its process and hence an internal view is provided.

In a similar way, the *Plusquamperfekt* can be used perfectively and imperfectively. The following examples illustrate the different uses. Example (2.16) is taken out of Andersson (2004, p. 7):

> *(2.15) Gestern begann das Team von Archäologen seine Grabungsarbeiten in einem Feld außerhalb von Hainburg. Davor hatten sie ein altes, verlassenes Haus, das über dem wichtigsten Punkt der Grabung lag, abgerissen*. ('Yesterday the team of archeologists began their excavation work in a field outside of Hainburg. Before, they had demolished an old, abandoned house, which was standing above the most important excavation point.
>
> *(2.16) Während sie das Haus abgerissen hatten, hatten sie die ganze Zeit auf Spuren der ursprünglichen Bauweise geachtet*. ('While they

had been demolishing the house, they had constantly been paying attention to the original architecture.')

In (2.15) the demolishing of the house is completed. The achievement is therefore temporally bounded. Also, the narrator places no focus on the progression of the demolishing process, but takes an external view. The *Plusquamperfekt* is, therefore, used perfectively. In (1.16), however, the demolishing of the house is described in more detail, as the workers' operation methods are elaborated on. Thus, the progression is focused on and an internal view is provided. Moreover, the demolishing process is temporally unbounded. The temporal adverbial *während* ('while') places the demolishing process in focus without limiting its temporal scope.

The above examples show that tense alone is not a straightforward indicator of grammatical aspect, as context clearly influences aspectual interpretation and hence interacts with tense. Another category interacting with tense, is **lexical aspect** (Behrens 1993, pp. 16f.; Ehrich, 1992, pp. 87-99). As Behrens pointed out, the *Perfekt* can either attain perfective or imperfective meaning, depending on the verb's lexical aspect:

(2.17) Hans hat geheiratet. ('Hans has married.')

(2.18) Hans hat (um 5) Klavier gespielt. ('(At 5 o'clock) Hans was playing piano.')

(2.19) Hans hat gehustet. ('Hans has coughed.')

Sentence (2.17) contains an accomplishment which is [+dynamic] and [+telic]. As such it involves a change of state (from being unmarried to being married) which is necessarily completed. Therefore, it is seen as perfective. In (2.18) an activity (*playing piano*) is described. As activity predicates are [+durative] and [-telic], the event is temporally unbounded and hence seen as imperfective. Sentence (2.19) includes an act (*coughing*). Acts are [-durative] and [-telic] and hence cannot be described in their progression. They are therefore perfective.

Another way to express the notion of (grammatical) aspect in German is the use of **lexical means**. To the knowledge of the present author, these lexical means have only been discussed with regard to imperfective aspect (e.g. Ebert, 2000, pp. 631f.; Aksu-Koç & von Stutterheim, 1994, pp. 402-404; Schmiedtová, 2004, pp. 76f.). In general, two linguistic devices can be used to express imperfective meaning; temporal adverbials and connectives.

Concerning temporal adverbials, the following have been identified as conveying imperfective meaning: *immer* ('always'), *gerade* ('just (now)'), or *immer noch* ('still'). One could imagine the following examples:

> *(2.20) Auf seinem Weg in die Arbeit kam Matthias immer an einem kleinen Café vorbei*. ('On his way to work Matthias always passed by a small café.)
>
> *(2.21) Gerade läuft im Fernsehen ein Film mit Catherine Deneuve*. ('Just now a film with Catherine Deneuve is running on TV.')
>
> *(2.22) Die Kinder spielten immer noch mit ihrer Wii Videospiel-Konsole*. ('The children were still playing with their Wii video game console.')

In sentence (2.20) *immer* indicates that Matthias regularly walked past a small café, rather than only once. As such the activity becomes temporally unbounded and hence imperfective. Sentences (2.21) and (2.22) express no habitual meaning. Instead, the temporal adverbials *gerade* and *immer noch* emphasise the progression of the described activities.

Connectives can also emphasise grammatical aspectual meaning. Examples include: *als* ('when'), or *während* ('meanwhile'). They are illustrated in the following sentences:

> *(2.23) Als der Spion ein Foto von den geheimen Bauplänen machte, kam sein Vorgesetzter ins Zimmer*. ('When the spy was taking a picture of the secret construction plan, his boss came into the room.')
>
> *(2.24) Während Christoph am Strand lag und ein Buch las, fuhr seine Freundin Wasserski*. ('While Christoph was lying on the beach and reading a book, his girlfriend was water skiing.')

In (2.23) *als* emphasises the durational phase of taking a picture, such that the event overlaps with the boss entering the room. Therefore, the temporal adverbial adds progressive meaning to the sentence. In (2.24) simultaneously occurring activities are described as being in process (*lying on the beach*, *reading a book*, *water skiing*). As such the sentence conveys progressive aspect. The temporal adverbial *während* merely double marks this.

Finally, **syntactic means** can be applied to mark grammatical aspect in German. These include prepositional constructions; '*sein*' *am* + Nominalization (e.g. *Ich bin am Arbeiten*. 'I am in the process of working.'), '*sein*' *beim* + Nominalization (e.g. *Wir sind beim Planen*. 'We are in the process of planning.'), '*sein*' *dabei zu* + Infinitive (e.g. *Sie sind dabei ihre Wohnung zu putzen*. 'They are busy cleaning their flat.') (Ebert, 2000, p. 607). These constructions “emphasize the dynamic, active character of [an] event” (p. 607) and as such they can be regarded as progressive markers (however see Zifonun, Hoffmann, Strecker, & Ballweg, 1997, p. 1877 for a critique).

2.1.4 Comparing Gr. and Lex. Aspect in English and German

English and German share certain semantic and formal features of aspectuality, however, as has been shown above, important differences exist between the two languages concerning the realization of lexical and grammatical aspect.

Concerning lexical aspect, it is possible to express predicate punctuality, telicity, and dynamicity in both, English and German. On the verb-level linguistic means include aspectual particles in English, and prefixation in German. Although aspectual particles and prefixation are both used to change durative, atelic predicates into telic predicates, prefixation in German is more frequent than aspectual particles in English. On the clause-level linguistic means include object definiteness for both languages.

As regards grammatical aspect, it is neither a dominant category in English nor in German. However, the degree to which grammatical aspect is expressed morphologically still differs between the two languages. In English, grammatical aspect can be expressed using the simple present tense (imperfective) or the simple past tense (perfective), but importantly, English also has the fully grammaticalised marker *-ing* (progressive aspect). In German, no fully grammaticalised marker is available. Rather, the meaning of imperfective, perfective, and progressive aspect has to be expressed via a combination of tense, linguistic co-text, lexical aspect and lexical means. As a consequence, some scholars have questioned the validity of using the category of grammatical aspect for German (e.g. Thieroff, 1992).

Based on this theoretical background, the question arises how L1 German speakers of L2 English process aspectuality, in particular progressive aspect, which is not overtly expressed in their L1.

2.2 Empirical Research on Aspectuality

Based on the above theoretical background on aspectuality, empirical research on aspectuality will now be presented. Empirical studies on aspectuality which are of relevance to the present research question include acquisitional studies as well as processing studies.

2.2.1 Acquisition

As has already been pointed out by Slabakova & Montrul (2002), the specific factors governing L2 acquisition may also hold for the L2 processing of aspectual information. Therefore, a summary of the prevalent view on the acquisition of aspectuality will be provided, as well as a critique. This summary will include L1 research as well as L2 research, however, a greater part will be dedicated to L1 research, as L2 research heavily draws on L1 findings.

2.2.1.1 Acquisition of Aspectuality in L1

Extensive research on the acquisition of actionality-temporality-aspect (ATA) has investigated the interaction between lexical aspect and grammatical aspect in past tense contexts. The majority of these studies have found that semantic associations between lexical aspect, grammatical aspect and past tense drive the acquisition process (see Li & Shirai, 2000 among many others). However, other findings suggest a more complex process potentially involving other acquisitional factors such as language typology (and input) (e.g. Behrens, 1993; Weist et al., 1984; Freiberger, 2008; Bertinetto & Noccetti, 2006). In what follows, the prevalent view on L1 ATA acquisition will be presented and explained from the perspective of nativist and functionalist approaches to language acquisition. Finally, a critical perspective will be provided.

The Prevalent View

A great number of ATA investigations from a range of L1s (English, Italian, Turkish, Modern Greek, Japanese, Chinese and French) have accumulated evidence that children's ATA acquisition follows a pattern (for a review see Shirai, 1991). This pattern has been variously termed the *Aspect Hypothesis* (e.g. Andersen & Shirai, 1994), the *Aspect Before Tense Hypothesis* (e.g. Bloom, Lifter, & Hafitz, 1980), the *Defective Tense Hypothesis* (e.g. Weist, Wysocka, Witkowska-Stadnik, Buczowska, & Konieczna, 1984),

the *Aspect First Hypothesis* (e.g. Wagner, 1998), or the *Primacy of Aspect Hypothesis* (e.g. Robison, 1990). The core developmental pattern is presented in Table 2.2.

	Lexical Aspect			
Gr. Aspect/Tense	*State*	*Activity*	*Accomplishment*	*Achievement*
Perfective Past	4	3	2	1
Progressive	---	1	2	3
Imperfective Past	1	2	3	4

Table 2.2: Acquisitional Order of Past Tense and Grammatical Aspect Morphology by Lexical Class. 1 indicates the earliest and 4 the latest occurrence (adapted from Li & Shirai, 2000, p. 50)

This acquisitional pattern can be viewed from two different perspectives (see Andersen, 1993, p. 311). Looking from the perspective of inflections, children use ATA markers predominantly with specific lexical aspectual classes. Thus, past perfective inflections are primarily used for achievements (e.g. *arrived*) and accomplishments (e.g. *painted a picture*). Only gradually, their use is extended to activities (e.g. *slept*) and states (e.g. *knew*). Progressive inflections are first used with activities and only later accomplishments and achievements. States usually do not take progressive meaning and they are never wrongly inflected with progressive aspect marking (see also Bickerton, 1981). Past imperfective inflections emerge later than past perfective markers and they are used first with states and activities, and then accomplishments and achievements.

Looking from the perspective of lexical aspectual classes, children typically inflect achievements and accomplishments with past perfective markers. Activities are inflected for progressive aspect and states are inflected for past imperfective.

The reason why it is necessary to bear in mind these two perspectives (which differentially emphasize either the importance of grammatical aspect and tense, or lexical aspect), is that no consensus has been reached so far about the triggering factor in ATA acquisition and, what is more, the assumption about what drives the acquisition process is rarely stated explicitly. However, four views about the triggering direction in ATA acquisition can be distinguished (see Slabakova, 2002, pp. 176f.).

View	Trigger		Acquired Form
1 Bloom et al., 1980	Lexical Aspect	→	Tense
2 Olsen & Weinberg, 1999	Lexical Aspect	→	Grammatical Aspect
3 Wagner, 2001	Grammatical Aspect	→	Tense
4 current *Aspect Hypothesis* proponents	Lexical Aspect	→	Tense + Grammatical Aspect

Table 2.3: Views on Possible Triggering Directions in ATA Acquisition

As presented in Table 2.3.[3], the first view can be found in early works on ATA acquisition, such as Bloom, Lifter and Hafitz (1980) who were proponents of the *Aspect Before Tense Hypothesis*. Bloom et al. studied spontaneous speech of four American children aged between 1;10 years and 2;4 years. They found that children predominantly used specific tense inflections with specific lexical aspectual classes. Therefore, the authors suggest that the "learning of rules for verb inflection appears to be facilitated by the semantics of the verb" (p. 410). Bloom and colleagues believed that children first begin to master lexical aspect, which helps them to learn tense. However, they believed that the strong influence of lexical aspect is only present at the beginning of the acquisitional process, and that gradually children are also learning tense while acquiring lexical aspect.

The second view about the triggering direction can be found in Olsen and Weinberg (1999). The authors studied the spontaneous speech of eight children at an unspecified age. The data were drawn from the CHILDES database, including the four children studied by Bloom et al. Results showed that "children initially choose the most restricted relationship between grammatical and lexical aspect, constraining the use of *-ed* to [+telic] verbs and the use of *-ing* to [+dynamic] and [+durative] verbs" (p. 537). The authors thus assume a mapping of lexical aspect onto grammatical aspect (Slabakova, 2004, p. 176). Their view is, therefore, different from Bloom et al.'s suggestion, in that lexical aspect is not seen as driving the acquisition of tense, but grammatical aspect. However, it seems difficult to prove one view or the other as past and perfective markers share the same morphological form.

The third view about the triggering direction was expressed by Wagner (2001). In her Experiment 2, the author carried out a comprehension experiment with two to four year old children. They were presented with scenes of a toy cat carrying out actions (e.g. draw a face) at two locations of a paper road. At the first location the action was either completed (i.e. the cat finished drawing a face), or incomplete (i.e. the cat draws a circle with only one eye). At the second location the action was always in progress and the child was asked the test question (e.g. *Show me where the kitty was/is drawing a face.).* When the action at the first location was completed and the action at the second location incomplete, even the youngest children could understand past and present questions. However, when actions were incomplete at both locations, two year old children had

3 Note that Bertinetto & Noccetti (2006) suggest a two part classification with either grammatical aspect or lexical aspect as trigger. The authors propose (among other things) to categorize Bloom et al.'s (1980) work as prioritising grammatical aspect before tense and not, as Slabakova (2002), lexical aspect. This disagreement is due to Bloom et al.'s loose definition of the term 'aspect'. However, following Slabakova and Li & Shirai (2000) the present author believes that Bloom et al. were primarily referring to lexical aspect.

comprehension difficulties. The author suggests that for these children "*is* and *was* is linked to completion information; that is, they ... use the auxiliaries to mark grammatical aspect" (p. 678). She tentatively concludes that "tense interpretations can be influenced by aspect in some fashion" (p.680).

Finally, current proponents of the *Aspect Hypothesis* argue for mapping of lexical aspect onto tense *and* grammatical aspect. Although not mentioned by Slabakova, Shirai and Andersen (1995) can be taken as an example of this view on the triggering direction. The authors studied spontaneous speech data of three children between the ages of 1;6 – 4;10 who were acquiring English. They found that in the emergent stage of TA inflections, children used past and progressive marking for verbs whose semantic meaning prototypically corresponded to the semantic features expressed by TA morphology. Thus, progressive marking was used for activities and iterative achievements (e.g. *jumping*), and past marking was used for achievements. Subsequently, the category of the prototype, describing "best exemplar(s)" (p. 758), becomes central in Shirai and Andersen's proposal and as "the prototypes of past (tense) and perfective (aspect) are very similar" (p. 759) the question of whether children code tense or grammatical aspect with past morphology seems resolved.

However, Berinetto and Noccetti (2006) draw attention to a conceptual problem that underlies any theory which proposes a triggering direction: "By selecting one particular category (aspect or actionality) as the triggering factor of the acquisitional process, one is implicitly assuming that the given category is mastered in a close to mature way by the learner from the very beginning." (p. 4). As this seems rather unlikely, the authors argue against a universal acquisition sequence and propose an alternative theory which will be presented at the end of this section.

Explanations for the Prevalent View

Having sketched the acquisition pattern of aspectual morphology in past contexts, the question arises as to why children show the above systematic distribution of inflections across lexical categories (i.e. use of past perfective with achievements, past progressive with activities and past imperfective with states). Explanations have been provided by nativists and functionalists alike (see Li & Shiari, 2000, pp. 29-34). They were originally proposed for L1 acquisition, but have also been taken up for L2 acquisition. Therefore, they will be summarized below.

In general, **nativists** argue that children "are equipped with innate principles or mechanisms that enable the acquisition of language" (Li & Shirai, 2000, p. 29).

Concerning ATA acquisition, they therefore posit innate semantic categories. These innate categories are reinforced or activated by the input (Slabakova, 2002, p. 181). Such a nativist explanation about tense-aspect acquisition has, most prominently, been put forward by Bickerton (1981) in his *Language Bioprogram Hypothesis* and Slobin (1985) in his *Basic Child Grammar*.

According to Bickerton (1981) children are equipped with an innate *bioprogram* that drives language acquisition. This bioprogram interacts with the linguistic input surrounding the child and language gradually develops out of this interaction:

> [T]he child is not supposed to "know" the bioprogram language from birth … Rather, the bioprogram language would unfold, just … as the body grows, presenting the appropriate structures at the appropriate times and in the appropriate, pre-programmed sequences ... [A]lmost … from the earliest stages, the evolving bioprogram will interact with the target language. Sometimes features in the bioprogram will be very similar to features in the target language, in which case we will find extremely rapid, early, and apparently effortless learning. Sometimes the target language will have evolved away from the bioprogram, to a greater or lesser extent, and in these cases we will expect to find common or even systematic "errors" which ... are simply the result of the child's ignoring … the data presented by speakers of the target language and following out instead the instructions of his bioprogram. (Bickerton, 1981, pp. 134f.)

With regard to ATA acquisition, Bickerton draws on Creole and L1 acquisitional data to argue for an innate bioprogram. He proposes two innate semantic distinctions which drive the acquisition process. The first distinction is between *states* and *processes*. It includes verbs such as *like* vs. *play.* According to Bickerton this distinction is innate because in the development of creoles children start to mark this aspectual distinction morphologically. Likewise, in L1 acquisition children mark this aspectual distinction morphologically: states are never marked with progressive *-ing*, whereas processes can receive progressive marking. The second distinction is between *punctual* and *nonpunctual* predicates, such as *He kicked the ball* vs. *He was washing the car*. Again, Bickerton uses Creole data to argue for the innateness of this aspectual category. He refers to the process of decreolization, which is "a retreat from the use of the Creole by those who have greater contact with a standard variety of the language" (Yule, 2002, p. 235). In this process, past marking is introduced and, importantly, it is systematically varied; punctual predicates receive more past-tense marking than nonpunctual ones. L1 acquisition, Bickerton claims, shows the same pattern and thus, the punctual-nonpunctual distinction is argued to be a pre-programmed distinction driving language acquisition.

In a similar fashion, Slobin (1985) proposed a nativist explanation for ATA acquisition. He based his argument within his notion of a Language-Making Capacity (LMC) which constructs early child grammar. The LMC can be envisaged as

> systems of knowledge and information processing that ... begin life with some initial procedures for perceiving, storing, and analyzing linguistic experience, and for making use of capacities and accumulated knowledge for producing and interpreting utterances. (Slobin, 1985, p. 1158)

Concerning ATA acquisition, Slobin argued that the perception and production of ATA markers is guided by a salient semantic distinction, namely the distinction between *result* and *process*. A *result* is punctual and completed, whereas a *process* is nonpunctual and ongoing. In basic child grammar this distinction is marked by the use of inflections. For example, verbs that clearly express a completed, punctual result such as change-of-state verbs receive past or perfective marking early on (e.g. *spilled*, *broke*).

In contrast to nativists, **functionalists** do not posit innate categories which drive language acquisition. According to functionalists, language primarily serves communication and it has to be viewed in a social context. “Language acquisition, in this view, consists of extracting the patterns that hold between forms and meanings in continuous speech, and linguistic input and the ability to analyze the linguistic input are essential to the learner in this process.” (Li & Shirai, 2000, p. 30).

Concerning ATA acquisition, functionalists therefore refrain from an explanation that uses pre-programmed semantic distinctions. Instead, they describe the developmental process in terms of a form-meaning relationship, or mapping. This form-meaning mapping can be guided by cognitive principles (Andersen, 1993), a combination of cognitive principles and ATA discourse function (Andersen & Shirai, 1994), or input (Li & Shirai, 2000).

Andersen (1993) hypothesised that various **cognitive principles** might give rise to the distribution bias in leaner language. One such principle is the *Relevance Principle*, which states that “a grammatical morpheme, such as a verb inflection, will be placed closer to the verb stem the more relevant the meaning of the morpheme is to the meaning of the verb” (p. 328). This would explain, why children initially mark lexical aspectual properties of the verb in the initial stages of ATA acquisition, and not tense.

Another cognitive principle which further limits the selection of grammatical morphemes is the *Congruence Principle*. It postulates that “a grammatical morpheme is used by learners according to how congruent the meaning of the morpheme is with the meaning of the lexical item to which it is attached” (p. 329). As the meaning of progressive marking is

congruent with the durational feature of activities, and past-perfective marking is congruent with the completed component of accomplishments and achievements, children predominantly use these combinations of verb stem and inflection.

A further principle that accounts for the distribution of tense-aspect morphemes in learner language is the *One-to-One Principle*. It “guides the learner to assume that each grammatical morpheme he discovers has one and only one meaning, function, and distribution” (p. 329). Therefore, learners initially attach one meaning to ATA morphemes.

Finally, learners are driven by the *Subset Principle* which assumes that “learners will assign a more conservative form:meaning relation to a morpheme or syntactic structure than fully proficient native adults in such a way that the learner's form-meaning relation is a logical subset of the proficient adult's” (p. 329). Thus, children's ATA distribution can be seen as a logical subset of adults' ATA use, which is less restricted.

While Andersen (1993) solely lists various cognitive principles to account for ATA marking, Andersen and Shirai (1994) embed these cognitive principles in a wider function, a **discourse function**. The authors believe that

> *all* of these principles follow naturally from the speakers' … communicative need to distinguish reference to the main point/goal of talk from supporting information, within the tradition of research on grounding and the functions of tense-aspect marking in narratives (p. 152)

Thus, the authors postulate a discourse function for the distributional bias. In this, they support a major strand in writing research which investigates the grounding of information in written narratives (e.g. Hopper, 1979). In writing research, it is traditionally assumed that narratives are divided into a foreground, which is made up of “the parts of the narrative which relate events belonging to the skeletal structure of the discourse” (Hopper, 1979, p. 213), and a background, which contains “supportive material which does not itself narrate the main events” (p. 213). There are various linguistic means with which foregrounding/backgrounding can be expressed. ATA is one such example. It is generally assumed that punctual verbs correlate with perfective aspect and appear in the foreground, while durative, stative and iterative verbs correlate with imperfective aspect and appear in the background (Hopper, 1979, p. 215). To illustrate this distinction, consider the following passage taken out of Reinhart (1984, p. 183): “*Nick opened the door and went into the room*. Old Anderson was lying on the bed with all his clothes on. He had been a heavyweight prizefighter and he was too long for the bed.” (emphasis in the original). Here, the sentence in italic forms the foreground. It consists of past tense achievement predicates conveyed in the perfective aspect. The rest of the passage builds

the background. Importantly, it contains a past tense activity predicate in the progressive aspect, and a past tense state predicate in the perfective aspect.

A third possible explanation for the distributional bias as provided by functionalists, was put forward by Li and Shirai (2000). The authors postulate a major influence of **input**. According to them, language acquisition is a connectionist learning process in which children find patterns of co-occurences:

> we consider learning as a computational process in which the learner simultaneously and interactively analyzes the co-occurences of linguistic forms with meanings, forms with forms, and forms with contexts … We describe this type of learning as a correlational, statistical procedure in which the learner implicitly tallies and registers the frequency of co-occurrences … or the co-occurrence constraints among grammatical morphemes, semantic features, and lexical forms. (p. 206)

Applied to ATA acquisition, this suggests that children register frequent form-meaning co-occurrences of single inflections in child directed speech (CDS). The commonest co-occurrences in CDS, Li and Shirai argue, are past and perfective morphology with [+punctual], [+telic] and [+result] meaning, and progressive marking with [-telic] and [+durative] meaning. These commonest form-meaning co-occurrences are also called prototypes (Shirai & Andersen, 1995). Children initially restrict their semantic representation of tense-aspect morphemes to these prototypes and only later expand their use of tense-aspect morphemes to non-prototypical use.

Critique on the Prevalent View

Not all L1 researchers agree that the *Aspect Hypothesis* is a valid explanation of early ATA use. That is, some researchers do not support the assumption that children are primarily guided by lexical aspect in their ATA acquisition (e.g. Bertinetto and colleagues, 2006, 2009, in press; Freiberger, 2008; Behrens 1993; Weist et al. 1984). For the present study it is especially important to present these critical views of the *Aspect Hypothesis*, because they might highlight cross-linguistic differences in L1 ATA acquisition, which in turn may influence ATA processing in L1 as well as L2.

For example, Bertinetto, Lenci, Noccetti and Agonigi (in press) strongly argue against the primacy of lexical aspect. They analysed spontaneous speech data of three Italian children aged between 1;6 and 3;0 years. Their results did not fully support the *Aspect Hypothesis;* while stative and telic verbs showed the predicted affinity with imperfective vs. perfective use respectively, activity verbs were either balanced in their use between

imperfective vs. perfective or, in the case of one child, predominantly used in the perfective aspect. Therefore, Bertinetto and colleagues suggest that lexical aspect cannot be the trigger for ATA acquisition in Italian.

Bertinetto and Noccetti (2006) take this argument further and, based on the above results, they suggest an alternative to the *Aspect Hypothesis*. According to them, children “start up with a global, syncretic ATAM category, where the fundamental dimensions are mixed up, i.e.: 'actionality∴aspect∴temporal reference∴(mood). The ensuing developmental stages may then differ according to the specific target language structure.” (p. 10). That is, in languages, such as Slavic languages for instance, where lexical aspect is marked overtly, but grammatical aspect and tense are only marginally explicit, lexical aspect would indeed be mastered first. However, in other languages, tense might emerge first. Thus, in this alternative hypothesis no primacy is given to lexical aspect and no universal pre-programmed pattern is assumed.

Based on the work of Bertinetto and colleagues Freiberger (2008) investigated the L1 acquisition of grammatical aspect, lexical aspect and temporal reference in Austrian German. She carried out an analysis of spontaneous speech data by a child, called Lena, who was aged between 1;7 – 4;3 years. The girl was mostly taped while playing with her mother. As Bertinetto and colleagues, Freiberger found no unequivocal support for the *Aspect Hypothesis*. While state vs. telic predicates were used in direction of the hypothesis with imperfective vs. perfective aspect, activity verbs were used contrary to prediction as they showed no significant imperfective use. Furthermore, telic verbs were not predominantly used in the *Perfekt*. This suggests that lexical aspect cannot be regarded as trigger in ATA acquisition in Austrian German. What is more, the author found a significant influence of input. Thus, the study confirms Bertinetto and colleagues' results by showing the importance of target language typology and input on ATA acquisition.

2.2.1.2 Acquisition of Aspectuality in L2 English

Findings on L2 ATA acquisition are regarded as possible indicators for the way aspectuality is processed (Slabakova & Montrul, 2002). Therefore, the prevalent view on L2 ATA acquisition will be summarised and explained. Finally, a critical analysis will be provided.

The Prevalent View

As in L1 research, lexical aspect is commonly assumed to guide ATA acquisition in L2 (e.g. Bardovi-Harlig & Reynolds, 1995; Li & Shirai, 2000). Thus, the *Aspect Hypothesis*,

which was originally formulated for L1 acquisition (see Chapter 2.2.1.1), is also assumed to hold for L2 acquisition: past perfective marking first appears with achievements and accomplishments which entail a telic event and later spreads to activities and states. Progressive marking, on the other hand, first appears with activities which entail an atelic event, and later spreads to accomplishments and achievements. States, however, are inflected differently in L2 from L1 acquisition. In L1 they are rarely inflected with progressive aspect. In L2, however, states more frequently appear with progressive aspect (Li & Shirai, 2000, 50).

This acquisitional process has been noted for various target languages and across various language backgrounds. For example, Clive Perdue and Wolfgang Klein carried out one of the most comprehensive L2 investigations into cross-linguistic ATA acquisition (see Dietrich, Klein, & Noyau, 1995). Their research included untutored L2 learners of English, German, Dutch, French, and Swedish from different L1 backgrounds (Punjabi, Italian, Turkish, Arabic, Spanish, and Finnish). The learners participated in interviews and an oral retell task over the period of two-and-a-half years. The results showed that “there is no significant SL [Source Language] influence in the acquisition of temporality” (p. 278).

Although the *Aspect Hypothesis* is widely supported in L2 acquisition research, even its supporters stress a possible influence of L1 on ATA acquisition. The most prominent example is a study by Quick (1997) (as reported in Li & Shirai, 2000). The author studied L2 English learners from three different L1 backgrounds, namely Chinese, Japanese and Spanish. Spanish parallels English in that it allows achievements to be used with progressive aspect (e.g. *salía,* 'was leaving'), conveying the same meaning as in English. Chinese, on the other hand, does not allow this construction and in Japanese it entails a different meaning. Thus, the author expected the L1 Spanish group to outperform the others. In line with the expectation, the results showed that in a verb form change and grammaticality judgement task, the L1 Spanish group scored higher than the Chinese and Japanese groups. In a picture description task, the result was similar, however, advanced L1 Japanese learners showed a higher correlation between achievements and progressive aspect. This result suggest that “non-prototypical uses of the progressive (i.e., with achievements) are facilitated by the similarity between L1 and L2 aspectual systems” (Li & Shirai, 2000, p. 85).

Furthermore, the bias predicted by the *Aspect Hypothesis* has been shown to affect later stages of L2 proficiency (see Robison, 1995; Bardovi-Harlig & Bergström, 1996; Li & Shirai, 2000). This gradual development is contrary to the L1 acquisition pattern, where a correlation between lexical and grammatical aspect can be noted early on. An explanation for this delay has been provided by Li and Shirai (p. 87) who hypothesise that the weaker

correlation in the early stages of L2 acquisition is due to holistic learning, where frequently occurring chunks are memorized as whole units without being analysed grammatically. The authors refer to an example in Robison (1995), who studied Puerto Rican college students learning English: “in the .. night .. he see television, .. and then .. (a-) .. (around) .. nine or ten .. he *going* to sleep” (Robison, 1995, p. 357, emphasis in the original). 'Going to sleep' is “a high frequency form in the input” (Li & Shirai, 2000, p. 88) and, therefore, it is likely to be memorized and reproduced as an unanalysed chunk. In beginning stages of L2 acquisition, therefore, form-meaning mapping is overridden by holistic learning.

Explanations for the Prevalent View

In L2 research, explanations for *the Aspect Hypothesis* have been drawn from L1 research (see Chapter 2.2.1.1). Thus, the same nativist and functionalist approaches have been applied as in L1 research. However, it has to be stressed that nativist explanations, while prominent in L1 research, are scarce in L2 research (Li & Shirai, 2000, p. 75). In what follows, findings from studies with nativist and functionalist backgrounds will be provided.

Remember that **nativist** explanations for ATA acquisition include Bickerton's (1981) *Language Bioprogram Hypothesis* and Slobin's (1985) *Basic Child Grammar*. Both theories postulate innate semantic categories, such as state vs. process (Bickerton) or results vs. process (Slobin). In production, these semantic categories receive ATA marking that matches their meaning. In L2 research, these explanations have been taken up by Robison (1995), who studied Puerto Rican L2 English learners and found that lower-level learners in particular associated grammatical aspect with lexical aspect. The author (while also providing other explanations) hypothesises that language learners “may have a predisposition to distinguish ... semantic categories” (p. 364). He even takes his argument further by comparing language processing to colour perception and suggests that “[t]his would be analogous to the well-documented physiological predisposition to distinguish four primary colors – red, green, yellow, and blue – even though the electromagnetic spectrum is homogeneous” (p. 364). Thus, Robison equals semantic categories, such as state vs. process, with the three genetically determined cone receptors for colour perception (see e.g. Eysenck & Keane, 2010, pp. 56-57 on colour perception). Robison so presents a strong nativist view about the development of ATA marking in L2 research.

Functionalist explanations, as described above for L1, refrain from the idea of innate semantic categories. Instead, ATA acquisition is believed to be driven by a form-meaning relationship, or mapping. For L1 this form-meaning mapping has been explained by

reference to cognitive principles (Andersen, 1993), cognitive principles and ATA discourse function (Andersen & Shirai, 1994), and finally input (e.g. Li & Shirai, 2000). For L2 all of these explanations are also being used to account for ATA acquisition.

Concerning **cognitive principles**, Andersen & Shirai (1994) believe that in ATA acquisition L2 learners, just like child L1 native speakers, are guided by the *Relevance Principle*, the *Congruence Principle* and the *One to One Principle* (p. 147). That is, the authors believe that in ATA acquisition (1) verbs are inflected for grammatical aspect before tense, because grammatical aspect is more relevant to the meaning of the predicate than tense, which merely places the event in time without affecting its internal meaning (*Relevance Principle*), (2) verbs are inflected for tense and grammatical aspect in congruence with the predicate's lexical aspect (*Congruence Principle*), and (3) language learners ascribe only one meaning and function to TA morphemes (*One to One Principle*). Together, these principles are used by speakers to "highlight the aspectual meaning already inferrable from the meaning of the verb" (p. 147).

But importantly, Andersen & Shirai hypothesise that L2, just like L1, speakers "follow especially the Relevance Principle and the Congruence Principle and even the One to One Principle because of the communicative function in live ongoing discourse" (p. 147). That is, the authors assume that speakers employ verbal morphology to fulfil a **discourse function**. As described in Chapter 2.2.1.1 this discourse function is to distinguish narrative foreground from narrative background. Empirical evidence for this suggestion, however, is not unequivocal in L2. Bardovi-Harlig (1998) analysed oral and written narratives of adult L2 learners of L1 Arabic, Korean, Japanese, Spanish and Mandarin. Results showed that achievements are inflected regardless of their appearance in narrative foreground or background. Accomplishments and activities, however, are inflected with regard to grounding and lexical aspect. For example, accomplishments are primarily inflected for simple past in the foreground, whereas activities are primarily inflected for progressive aspect (without auxiliary, present progressive, and past progressive) in the background. The author concludes by suggesting that "a description of the distribution of emergent verbal morphology must have recourse to both discourse structure and lexical aspectual category" (p. 497).

Finally, **input** has also been identified as a source for the distributional bias noticed in L2 ATA acquisition. As has already been described for L1 acquisition, Li & Shirai (2000) suggest that L1 native speakers use ATA morphology in a prototypical sense, that is, they use past and perfective morphology for [+punctual], and [+telic] events and progressive morphology with [+durative], and [-telic] events. L2 learners are believed to extract these prototypical uses from the input based on a connectionist learning mechanism which is

sensitive to the frequency of form-meaning co-occurrences. Evidence for this claim, however, is scarce in L2 research. As has been pointed out by Bardovi-Harlig (1999) too little is known about the L2 acquisition of typologically different languages, such as Russian and Chinese, in order to claim a strong influence of L2 input.

Critique on the Prevalent View

Not all L2 researchers agree that ATA acquisition is primarily guided by lexical aspect. For the present discussion, the most important critique was presented by Rohde (1996). It is summarized below.

Rohde (1996) studied spontaneous speech data by two L1 German boys (Lars and Heiko), who were living in California and learning L2 English. At the time of recording, Lars was six years old and Heiko was nine years old. Rohde argues that the data only partially support the *Aspect Hypothesis*. As predicted by the hypothesis, past marking was predominantly used with achievements (e.g. *He dropped it.*) and 3rd person present tense *-s* marking was mainly used with states (e.g. *Who likes to fish?*). However, contrary to expectation, bare infinitives in past contexts were mainly applied to achievements (e.g. *steal*) which should had been marked for past tense because of their [+result] feature. Furthermore, progressive marking was not only used with activities (e.g. *This one is still swimming, too.*). It also appeared to a large part with achievements (e.g. *Now I'm jumping to right there.*). Rohde hypothesises that this marking occurred because the progressive may also be used for future reference (e.g. *It's coming.*). Taken together, Rohde suggests that "it is not lexical aspect that is highlighted but tense" (p. 1133). However, the author remains cautious about any universal generalization, as he notes that his findings "may be attributed to the combination of languages involved in this study" (p. 1133).

In sum, Rohde voices the same critique that has also been voiced in L1 research by e.g. Bertinetto and Noccetti (2006). That is, he draws attention to the importance of the source language system in the development of ATA acquisition, and tentatively suggests that L2 English learners of a tense-dominant language, such as German, might initially try to mark tense instead of aspect. This suggestion has also important implications for L2 processing research.

2.2.1.3 Comparing L1 and L2 Acquisition of Aspectuality

As is evident from the discussion above, L2 ATA acquisition shares similarities but also differences with L1 ATA acquisition (see Li & Shirai, 2000). A comparison of the two

acquisition processes can identify the distinctiveness of L2 ATA acquisition, and more importantly, highlight L2 specific factors which affect the L2 processing of grammatical and lexical aspect.

A similarity between L2 and L1 ATA acquisition is the above mentioned distributional bias of achievements and accomplishments to appear with past/perfective marking and activities to appear with progressive marking. Furthermore, the generalization of ATA marking to other situation types (e.g. the use of past-perfective marking with activities) proceeds along the same developmental stages (see Li & Shirai, 2000, p. 50).

However, there are also significant differences between L2 and L1 ATA acquisition. First, in L2 the distributional bias appears in later developmental stages, when learners have progressed from re-producing unanalysed chunks to using verbal morphology productively. Second, the distributional bias is more pronounced in L2. Finally, L2 performance is more diverse and not as stable (p. 193).

These differences are not surprising if one takes into account the different factors that influence the L2 learning process. According to Li and Shirai (pp. 193f.) there are internal as well as external factors. The internal factor influencing the L2 learning process is the already acquired L1 system. The external factors that are specific to the L2 learning process, are instruction, input, and interaction. Concerning instruction, classroom learners are taught explicit rules and develop conscious knowledge of the target language. In L1 acquisition, on the other hand, there is far less explicit teaching, and subsequently children have less conscious knowledge about the rules of their mother-tongue. Although no study has explicitly addressed this issue, Li and Shirai assume that conscious knowledge “may affect the form-function mapping in ways different from L1 learning” (p. 194). As regards input, Li and Shirai suggest that L2 learners' exposure to the target language is qualitatively and quantitatively different. Although not exemplified by the authors, this suggests that L2 learners perceive more non-target like speech than L1 learners. Furthermore this suggests that, L2 learners, who do not live in the target language environment, are generally surrounded less by the target language than L1 learners. This different input is assumed to affect the L2 acquisiiton process. As concerns interaction, Li and Shirai assume that L2 learners' interaction with other target language speakers is different from L1 child to adult interaction. The authors suggest that L2 learners engage in more talk right from the start of their learning process, because they are expected to speak or because they want to speak. As a consequence “they often heavily rely on memorized forms” (p. 194). This strategy models the learning process in a distinct way.

In sum, this suggests that despite the similarities found between L1 and L2 ATA, the L2 acquisition process is qualitatively different. Internal as well as external factors affect the learning task. All of these factors are also likely to influence the L2 processing of grammatical and lexical aspect.

2.2.2 Processing

As has been presented above, a vast number of studies have investigated the L1 and L2 acquisition of aspectuality as well as various factors governing its development. In recent years a growing number of studies within the field of cognitive psychology and psycholinguistics have built on this work and added insights on the processing of aspectuality. These studies will now be summarized for L1 and L2 respectively. Together with the background on the acquisition of aspectuality, this summary will provide the basis for predictions on the foregrounding/ backgrounding of aspectual information.

2.2.2.1 Processing of Aspectuality in L1

In recent years a growing number of studies in the area of cognitive psychology and linguistics have added insights to already existing theoretical accounts of aspectuality, and thus provided evidence for its psychological reality. Researchers have mainly aimed to investigate the influence of grammatical aspect on the processing of language. However, there are also some studies addressing the role of lexical aspect within language comprehension.

Grammatical Aspect

Studies investigating the processing of grammatical aspect have shown that comprehension is influenced by aspectual markers. For example, grammatical aspectual markers influence the interpretation of an event's completion status (completed vs. ongoing). Moreover, grammatical aspectual markers influence the allocation of attention on a certain part of an event (end-state vs. middle). Finally, aspectual markers influence the accessibility of an event in memory (more accessible and foregrounded vs. less accessible and backgrounded). Below, these findings will be summarized and discussed.[4]

Concerning the influence of grammatical aspect on the interpretation of an event as **completed vs. ongoing**, Magliano and Schleich (2000) have shown that events in the

4 The present summary is based on Madden & Ferretti (in press), however, recent investigations are taken into account.

perfective aspect are perceived as completed, whereas events in the progressive aspect are perceived as ongoing. In Experiment 1 participants read short narratives sentence by sentence. One of the sentences was the critical aspect sentence containing a verb in the perfective or progressive aspect (e.g. *Betty delivered/ was delivering their first child.*). Following this critical sentence, a question appeared asking participants whether the event is completed (e.g. *Has the baby been born yet?*). Importantly, the question could appear from one to four sentences after the critical sentence. Participants had to make a 'yes' or 'no' decision. Results indicated that across the four sentence positions the probability for progressive activities to be ongoing was higher than for perfective activities. However, for progressive activities the probability that the event was completed increased across the four sentence positions. This "suggests that as more information is read, participants had a higher likelihood of updating their situation models to indicate that the in-progress activity was completed" (p. 93). For perfective activities, however, the probability that the event was completed increased across the four sentence positions. Magliano and Schleich interpret this unexpected finding by hypothesising that "[p]articipants appeared to be guessing at sentence positions 3 and 4" (p. 94). In Experiment 2 a similar test design was used. Additionally, however, a distinction between short (e.g. *scratching your nose*) and long activities (e.g. *watching a movie)* was made. Consistent with Experiment 1, results showed that progressive activities were more likely to be considered ongoing, whereas the opposite effect was true for perfective activities. The duration of an activity also had an effect; short progressive activities were more likely to be perceived as completed than long ones in sentence position 4. Similarly, short perfective activities were more likely to be perceived as completed than long ones in sentence position 1. In sum, this shows that "both verb aspect and world knowledge combine to provide information regarding the duration of narrative events and activities on a timeline" (p. 98).

Similarly, Madden and Zwaan (2003) showed that perfective aspect invites a mental representation of a completed event. In Experiment 1, participants were presented with a sentence containing an accomplishment in either perfective or progressive aspect (e.g. *The man made/ was making a fire.*). Then participants were shown two pictures; one picture depicted a completed action (e.g. a man kneeling next to a lighted fireplace), the other depicted an action in progress (e.g. a man putting firewood into a fireplace). Participants had to decide which picture matched the test sentence best. Picture-sentence matching decisions were recorded. Results showed that when presented with perfective sentences, participants were more likely to choose pictures portraying completed actions over pictures portraying ongoing actions. When presented with a progressive sentence, however, participants showed no clear preference for either picture type. In Experiment 2,

participants read the same test sentences as in Experiment 1. However, they were only presented with one picture, and had to decide whether the picture matched the sentence or not. Decision latencies and accuracies were recorded. The results replicated those of the first experiment; when presented with perfective sentences, participants were faster to respond to pictures showing a completed action, than to pictures showing an ongoing action. However, when reading progressive sentences, participants demonstrated no response advantage for either picture type. In Experiment 3, the order of presentation was changed; participants were first presented with a picture and then had to decide whether a following sentence was related to the visual stimulus. Again, there was a processing advantage for perfective sentences preceded by a completed picture as opposed to an intermediate picture, but no facilitation for progressive sentences. Madden and Zwaan give two theoretical explanations for the observed processing difference in Experiments 1-3. First, the authors hypothesise that "not all comprehenders represent the progressive sentences at the same intermediate stage of completion" (p. 669). So, for example, some readers might represent the sentence *The man was making a fire* by constructing the mental picture of a kneeling man who puts firewood into the fireplace, having matches lying next to him. Other readers, however, might construct the mental picture of a kneeling man lighting a pile of firewood in the fireplace with burning matches. This variance in mental representations might have led to the high variance in response latencies. The second possibility is that readers do have "similar representations of progressive sentences, but that they represent the internal structure of the event dynamically, simulating each stage of the event sequentially as the stages would be experienced." (p. 670). Subsequently, both picture types would have captured the mental representation, leading to the lack of preference for one picture type. Whichever explanation might prove right in future research, Madden and Zwaan have shown that perfective aspect yields a stable representation of the end-state of an event, whereas progressive aspect produces more varied representations.

Madden and Therriault (2009) used a self-paced reading task and sensibility judgements to demonstrate how verb aspect influences perceptual simulations of situations. In Experiment 1, participants read single sentences word-by-word. The sentences were either presented in the perfective or progressive aspect (e.g. *John had worked/was working on his laptop in his library.*). The grammatical object (e.g. *laptop*) was always replaced by a picture depicting it either in use or not in use. This yielded a 2 x 2 design with grammatical aspect (perfective vs. progressive) and picture type (in use vs. not in use). During the self-paced reading task reaction times for the picture and the following two words were collected. After the self-paced reading task, participants had to judge whether the sentence made sense. Reaction times and accuracy rates for the sensibility

judgements were recorded. Results for the pictures revealed that objects depicted as in use were processed faster than objects not in use. For the first word following the picture, results showed that words following an in use picture were processed more quickly than words following a not in use picture. This effect was magnified if the sentence had been presented in the progressive aspect. For the second word following the picture, results indicated that the picture type alone had no effect. Rather, an interaction between grammatical aspect and picture type was significant; second words were read faster when progressive sentences included a picture showing an in use object. Finally, results for the sensibility judgements again showed that the in-use picture condition yielded faster reaction times, especially, when in-use pictures were presented in progressive sentences. In sum, the experiment demonstrated that "pictures of objects in use are more easily integrated into ongoing representations" (p. 1298). Experiment 2 served as a control. Participants read picture labels (e.g. *picture of an open/closed mailbox*) and then saw a corresponding picture (e.g. of an open or closed mailbox) or a filler. They had to decide whether the label and the picture matched or not. Results showed that no facilitation effect occurred without a sentence context and confirmed the validity of Experiment 1. In conclusion, Madden and Therriault showed that "[t]he ongoing simulation is quickly deactivated in the perfect sentences, whereas it remains active in the progressive sentences. Thus, verb aspect acts as a cue to regulate the duration of active simulations of described situations." (p. 1300).

Concerning the influence of grammatical aspect on the allocation of attention towards the **end-state vs. middle** of an event, Morrow (1985) provided first evidence of the differential effect caused by grammatical aspect. In a series of experiments, participants memorized the diagram of a house and then read six-sentence narratives about a character moving within that house. Each story contained a critical motion sentence (e.g. *She walked from the study to the bedroom.*), which was controlled for grammatical aspect (perfective vs. progressive) and prepositions (e.g. *into, to, from*). The critical sentence was followed by a sentence including a definite noun phrase (e.g. *She didn't find the glasses in the room.*), which later served as a referent for the test question (e.g. *Which room is referred to?*). Results demonstrated that past perfective sentences can either signal path or goal prominence, depending on the preposition read. For example, the preposition *past* highlights the path of the character (e.g. *He walked to the bedroom past the living room*.). Likewise, the preposition t*hrough* highlights the path (e.g. *He walked to the bedroom through the living room.*). However, the preposition *into* highlights the goal (e.g. *She walked from the study into the bedroom*.). Past progressive sentences, on the other hand, "ad[d] a constant amount of path prominence" (p. 402), irrespective of the preposition used.

Anderson, Matlock, Fausey and Spivey (2008) used a computer-mouse tracking method to demonstrate how grammatical aspect influences the allocation of attention towards the middle or end-state of an event. Participants listened to sentences including a motion verb in the past perfective or past progressive (e.g. *John jogged/was jogging to the woods and then stretched as he got there*). Then they used a computer-mouse to place the character into a scene presenting the path and the destination. Participants placed the character near the destination after listening to perfective sentences, however, they positioned the character at the beginning or the centre of the path when hearing stimuli in the progressive. This result indicates that the perfective "focus[es] attention on the end of the path and the location of the completed action" (p. 2257), whereas the progressive "focus[es] attention to the "middle" of the event and the region of that ongoing action" (p. 2257). Moreover, the time to move a character from its origin to the destination took considerably longer in the progressive condition. This reveals that "the past progressive form of the verb encourages perceptual simulation of the temporally extended process of the action more than the point of its completion" (p. 2257).

Bergen and Wheeler (2010) complement and expand these results with a study using a sensibility judgement task. Participants were presented single sentences describing hand movement actions either towards or away from the body (e.g. *Carol is taking off/putting on her glasses*.). Afterwards, participants had to decide if the described action required movement of the hand toward or away from the body" (p. 152) by pressing a button. Importantly, sometimes the YES button was closer to the body than the NO button, and sometimes it was further away from the body than the NO button. In Experiment 1 only progressive aspect sentences were presented. Results showed that reaction times were faster when the hand motion described in the test sentence (towards the body vs. away from) matched the response button location (closer to the body vs. further away). In Experiment 2 only perfect sentences were presented. No significant interaction between hand movement as expressed by the sentence preposition and YES button location was observed. Therefore, Bergen and Wheeler drew the following conclusion: "While progressive sentences drive understanders to mentally simulate the internal processes of described events, perfect sentences do not. This suggests that grammatical structures affect how language understanders engage their perceptual and motor systems to perform mental simulations of described content." (p. 155).

The above described differential effect of grammatical aspect on understanding has an effect on the **activation level of information** in working memory; completed events inviting an endstate view on a situation have a lower activation level than ongoing events.

Various studies have demonstrated this effect by measuring the activation of characters, instruments, locations and, most importantly for the present research question, situations.

For example, Carreiras, Carriedo, Alonso and Fernández (1997) investigated the influence of grammatical aspect on the activation of characters during reading. Participants read short stories about two characters within the same scenario. The critical sentence described these two characters either performing actions at the same time, or not. Grammatical aspect was therefore varied (e.g. *John had finished/was finishing his shift when Mary arrived at the restaurant*.). At the end of the story, participants had to decide whether a probe name (e.g. *John*) had appeared in the story before. Results revealed that response times were faster when the activity the character engaged in was described in progressive aspect rather than the perfective aspect. Thus, grammatical aspect "help[s] readers to select information and to place it appropriately on a foreground-background dimension" (p. 444).

Truitt and Zwaan (1997) presented a paper in which they reported the same effect of grammatical aspect for instruments. As reported in Ferretti, Kutas and McRea (2007) and Madden and Ferretti (in press), participants read short narratives in which actions were described which potentially involved an instrument (e.g. *He pounded/was pounding the nail.*). These actions were either presented in the perfective or progressive aspect and participants had to respond to a probe word testing for the inferred instrument (e.g. hammer). Reaction times to the instrument were slower for perfective than for progressive versions. This result indicates that "instruments are more available in a reader's mental model when situations are described as ongoing (progressive) rather than completed (perfective)" (Madden & Ferretti, in press, p. 12).

Furthermore, Ferretti, Kutas and McRea (2007) carried out a series of experiments, where they found a comparable effect of grammatical aspect for locations. In Experiment 1 a semantic priming task was employed; participants read a verb silently and then pronounced out loud a location. The verb could either be presented in the perfect or progressive aspect and the verb-location pair could either be related (e.g. *had skated/was skating – arena*) or unrelated (e.g. *had prayed/was praying – arena*). Results showed that participants pronounced locations more quickly when the prime was presented in the progressive aspect. This result has been taken to indicate that "the progressive aspect highlights the path or location of entities in events" (185). In Experiment 2 a sentence completion task was administered; participants had to continue sentences which either included a perfect or progressive aspect (e.g. *The actress had sung__/was singing__.)*. Results revealed that progressive sentences were completed with locative prepositional phrases (e.g. *in the room*), whereas perfect sentences were completed with noun phrases

or adverbial information (e.g. *the song, loudly*). This shows that “event location information is more highly activated, salient, and/or natural when events are presented as unfolding in time” (p. 187), whereas “events presented as completed tend to highlight information that is typically more associated with resultant states (e.g., participants and objects)” (p. 187). Experiment 3 complemented these results with Event-Related Brain Potential (ERP) data. Participants read sentences including prepositional phrases. These prepositional phrases either described high expectancy locations (e.g. *The diver snorkeled/was snorkeling in the ocean.*) or low expectancy locations (e.g. *The diver snorkeled/was snorkeling in the pond.*). N400 amplitudes and slow cortical waves were recorded. N400 amplitudes serve as an “index of semantic expectancies” (p. 187). As would be expected, results indicated that prepositional phrases were highly expected when sentences were presented in the progressive aspect and locations were highly typical. However, prepositional phrases were highly unexpected when sentences were presented in the progressive aspect and locations were not typical. Thus, “the progressive form of the verb leads to specific expectations about where the events denoted by the verb will occur” (p. 191). However, prepositional phrases following verbs in the past perfect showed no differential influence of aspect. This shows that “location expectancies are less well formed for sentences in the perfect aspectual form” (p. 191). Slow cortical waves, on the other hand, “are sensitive to the ease with which people integrate words into a sentence representation” (p. 187). Their analysis revealed that verbs biasing locative prepositional phrases showed an effect of aspect; participants found it easier to integrate prepositional phrases following verbs in the progressive aspect. Finally, early sensory ERP components (P1, P2) were analysed. They have been shown to be “sensitive to manipulations of visual processing and visuospatial selective attention” (191). Therefore, these measures can report on attentional allocation during language processing of spatial information. Results indicated that grammatical aspect and location expectation influenced attentional distribution; most prominently, perfect verbs co-occurring with typical locations evoked smaller P1s and P2s than any other condition, indicating suppressed location information and a resulting heightened processing cost.

Complementing these data on grammatical aspect is the already mentioned study by Magliano and Schleich (2000). Whereas Experiments 1 and 2, as reported above (see p. 44), aimed to investigate the perception of un/boundedness, Experiments 3 and 4 tested the activation and accessibility of situations. In Experiment 3 participants read short stories sentence by sentence. The critical sentence alternated perfective and progressive aspect (e.g. *Betty delivered/was delivering their first child.*). At two different story positions a probe appeared (e.g. *deliver baby*) and participants had to decide as quickly and as accurately as possible whether the activity had occurred in the current story or not. The

reaction time analysis showed that in both story positions probes testing for activities which had been conveyed in progressive aspect were responded to faster (than when they had been conveyed in perfective aspect). This indicates that “the activation level of a perfective activity quickly decays below the threshold of activation necessary for it to be readily accessible to working memory” (p. 107). However, “the activation level for a progressive activity decays at a slower rate” (p. 107). Experiment 4 employed the same design. However, participants were pre-tested on their working memory span. Results showed that low-span readers were indifferent to grammatical aspect in both sentence positions. High-span readers, however, demonstrated a significant effect of grammatical aspect at the later probe position: progressive actions were responded to faster than perfective ones. This suggests that “high-span readers have more resources to maintain progressive activities at a high level of activation than low-span readers” (p. 107). In sum, the study provides further support for the assumption that “grammatical markers provide important processing instructions regarding how to construct a situation” (p. 107).

Lexical Aspect

Markedly less research has been devoted to the topic of lexical aspect and only a handful of processing studies exist. They are mainly concerned with the processing of telicity (e.g. O'Bryan, Folli, Harley, & Bever, 2003; Seegmiller, Townsend, DeCangi, & Thomas, 2004; Seegmiller, Townsend, Call, Mancini, & Illia, 2005; Hacohen, 2006; Malaia, Wilbur, & Weber-Fox, 2009). However, there are also investigations into the processing of durativity (Piñango, Zurif, & Jackendoff, 1999; Piñango, Winnick, Ullah, & Zurif, 2006; Coll-Florit & Gennari, 2011). The fundamental question raised within these studies is whether lexical aspect affects sentence processing. The present thesis is concerned with the processing of telic events (accomplishments) vs. atelic events (activities). Therefore, the most relevant studies on the processing of telicity will be summarised below.

A very basic issue in psycholinguistic research concerns the question whether the distinction between telic vs. atelic predicates as proposed in theoretical accounts of aspectuality is also psychologically real. One of the first convincing studies on this issue was provided by Hacohen (2006). The author investigated six year old children and adult Hebrew speakers. Participants saw video clips of characters who were ordered to perform a certain action (e.g. *empty a glass*). The critical test videos all included incomplete actions. After watching the video clip, participants were required to decide whether the characters had done what they were told. As the actions were presented as incomplete, orders formulated with telic predicates (e.g. *eat the orange, eat the oranges, eat the rice*) should be rejected, as they were not carried out. However, those conveyed with atelic

predicates (e.g. *eat oranges, eat rice*) should be accepted, as they describe complete and incomplete events, e.g. *eating rice* always entails 'having eaten rice' as well as 'still eating rice'. Results showed that six year old children did not yet distinguish between telic vs. atelic predicates, whereas adults did. As expected, adults' acceptance rate for atelic predicates was significantly higher than for telic predicates.

Another interesting question is, whether this psychologically real differentiation between telic vs. atelic predicates yields a quantitative difference in language processing. Seegmiller, Ingraffea, and Townsend (2003) carried out a pilot study investigating this issue. The authors tested adult English speakers. Based on an experiment carried out by Magliano and Schleich (2000), Seegmiller and colleagues presented their participants with short stories sentence by sentence. Each story contained a critical sentence (e.g. *The firemen rescued/were rescuing a survivor/survivors.*). This sentence alternated between telic vs. atelic predicates. A recognition probe (e.g. *rescue survivor*) appeared some time after the critical sentence and participants were required to decided whether the recognition probe had appeared in the story, or not. Reaction times to these probes were measured. Results showed that there was a quantitative difference in processing time between telic vs. atelic predicates. Reaction times for telic predicates were faster than for atelic predicates.

Beside quantitative processing differences, it is also interesting to see whether there are qualitative processing difference between telic vs. atelic predicates. Malaia, Wilbur and Weber-Fox (2009) used event-related potential (ERP) methodology and were thus able to investigate this issue. Their participants were English monolingual speakers. They were divided according to their grammar processing ability into a normal and high proficiency group. They were presented with garden path sentences, which require a phrase structure re-analysis. More specifically, they read object-reduced relative clauses which either included telic or atelic verbs (e.g. *The astronomer celebrated/left by the colleagues found an asteroid*.). In a word-by-word fashion they read the sentences and answered comprehension questions afterwards. Their EEG activity was recorded. First, the study showed a significant neurological effect of telicity on the ease of recovery from the garden-path effect. Especially, atelic predicates produced more negative ERPs in anterior scalp regions than telic predicates. This suggests that telic predicates demand fewer processing resources than atelic ones. Second, the study provided evidence for neurological differences between proficiency groups. More specifically, the high proficiency group showed earlier telicity effects, already taking place at the preposition *by* with higher negativity at P200 and Anterior Negativity between 320-500 ms after stimulus onset. In the normal proficiency group the telicity effect was delayed until the second

argument (e.g. *colleagues*), characterized by an increased negativity at the N100 amplitude and continuing to the P200 amplitude. However, the authors leave it open as to whether this differential processing is due to linguistic proficiency or non-linguistic cognitive processes (e.g. verbal working memory). In sum, the study provides “support [for] the postulated conceptual/semantic distinction underlying the two verb categories, and demonstrate[s] that world-knowledge about actions designated by verbs and syntactic proficiency are reflected in on-line sentence processing” (Malaia, Wilbur, & Weber-Fox, 2009, p. 145).

In conclusion, first results show that telicity affects sentence processing. What is more, quantitative as well as qualitative differences between the processing of telic vs. atelic events have been noted. While telic events seem to be processed faster and with more ease, atelic events seem to be processed slower and with more cognitive difficulty. However, more behavioural and neurological research is necessary, especially above the sentence-level.

Interaction of Grammatical and Lexical Aspect

As discussed above, a combination of grammatical and lexical aspect is likely to influence language acquisition. Whether this interaction also extends to language processing and comprehension is thus far unclear. However, two studies by Yap and colleagues (2006) provide some first insights.

Yap, Kwan, Yiu, Chu, Wong, Matthews and Shirai (2006) investigated the interaction between grammatical and lexical aspect in Cantonese using an utterance-picture matching task. In Experiment 1 participants heard sentences including an accomplishment predicate. The aspect marker alternated between perfect *zo2* or *jyun4* (e.g. *Go3 laam4zai2 jau4-zo2 seoi2*, 'The boy has swum.') and progressive *gan2* or *hai2dou6* (e.g. *Go3 laam4zai2 jau4gan2 seoi2*, 'The boy is swimming.'). After hearing a sentence, participants were presented with a set of two pictures depicting the heard activity as either completed or ongoing. They had to chose which picture best described the sentence they had just heard. For accomplishment predicates a perfective facilitation was found: when presented with sentences in the perfect aspect, participants were faster to chose the corresponding picture. In Experiment 2 the same test design was used, importantly however, only activity predicates were included in the test sentences. For activity predicates a progressive facilitation was found: participants were quicker to chose a picture when they were presented with a progressive prime. Both experiments suggest that grammatical aspect interacts with lexical aspect: “progressive markers impose reference to the internal stages of the event, which matches the atelic nature of activity

verbs" (p. 2414) and "[p]erfective aspect markers are compatible with (and apparently reinforce) a 'boundedness' representation" (p. 2414). In Experiment 3, however, this interaction effect could not be replicated. The same test design as above was employed, but importantly, both accomplishment and activity predicates were included. Now, progressive facilitation with activity predicates was found again, but no significant effect of aspect was observed for accomplishments. This indicates that "perfective facilitation is more fragile in the context of two verb classes, while progressive facilitation with activity verbs remains robust" (p. 2415).

Yap, Chu, Yiu, Wong, Kwan, Matthews, Tan, Li and Shirai (2009) took up anew the issue of a processing asymmetry, based on the interaction between grammatical and lexical aspect. In their new study, the same utterance-picture matching task was employed. However, only one experiment was conducted where both activity and accomplishment predicates were included. This time, a robust processing asymmetry was found: progressive activities yielded faster picture choices than perfective activities, and perfective accomplishments showed faster reaction times than progressive accomplishments. This finding is consistent with the assumption that progressive aspect highlights the ongoingness of a situation and thus corresponds to the characteristics of activity predicates which have no natural endpoint. Likewise, perfective aspect draws attention to the end-state of a situation and thus matches the meaning of accomplishment predicates. Yap et al. summarise their finding in the following principle: "*Like reinforces like*. That is, similar features reinforce each other. At the same time, dissimilar features have a dampening effect on each other." (p. 592, emphasis in the original). Unfortunately, the authors make no reference to their previous work, and thus give no interpretation as to why these diverging results were gained.

2.2.2.2 Processing of Aspectuality in L2

Although the acquisition of aspectuality has received substantial interest within the field of L2 research, investigations into the processing of aspectuality are scarce. Rare exceptions are studies carried out by Slabakova and Montrul (2002), and Montrul and Slabakova (2002), as well as Seegmiller, Townsend, Call, Mancini and Ilia (2005).

Slabakova and Montrul (2002) allow first insights into how L2 learners interpret sentences containing aspectual information. In their study, intermediate and advanced English learners of L2 Spanish judged the logical felicity of conjoined sentences in the Imperfect and Preterite. The lexical classes used were accomplishments (e.g. *Marisa leía un cuento por las noches pero no llegó al final.* 'Marisa was reading a story in the evenings but she

didn't finish it.'), achievements (e.g. *Los González vendían la casa pero nadie la compró.* 'The Gonzalez family were selling their house but no one bought it.'), and states (e.g. *El BMW me costó (PRET) $ 80,000 pero no lo compré.* 'The BMW cost me $ 80,000 and I didn't buy it.', or *El yate me costaba (IMP) $1,000,000 pero no lo compré.* 'The yacht cost me $1,000,000 and I didn't buy it.'). For accomplishments and achievements it was expected that Imperfect sentences would yield high acceptability scores as they are not bounded temporally (e.g. *leía* 'was reading') and thus allow the negation in the second sentence (e.g. *pero no llegó al final* 'but she didn't finish it'). Conversely, accomplishments and achievements in the Preterite were expected to yield a low acceptability rate. In accordance with these expectations, the Imperfect/Preterite contrast for achievements and accomplishment predicates was highly significant. For states, it was predicted that the Imperfect/Preterite distinction would pose some difficulty, because in English states are usually not morphologically marked with an imperfective ending as opposed to Spanish. However, both learner groups showed a significant contrast in this condition, accepting the Imperfect and rejecting the Preterite sentences. The authors suggest that "[t]hese results would point to the conclusion that L1 transfer is not operative in the interpretive domain" (p. 386). However, they acknowledge that "[i]t is possible that [their] intermediate participants were too advanced to demonstrate L1 transfer, and that they are already well on their way to acquiring the Spanish contrast" (p. 386). In sum, Slabakova and Montrul showed that intermediate and advanced L2 learners are able to acquire the semantic contrast between Preterite and Imperfect sentences with accomplishments, achievements, and states. Moreover, they did not find any interaction effect between grammatical and lexical aspect, however, they point to the possibility that their "learners [were] too advanced to demonstrate such a differential treatment of telic and atelic lexical classes" (p. 386).

Extending this line of research, Montrul and Slabakova (2002) examined a possible correlation between the knowledge of aspectual morphology and the knowledge about its meaning. For this purpose they used the same methodological design as the one reported above, with the difference that they also pre-tested their participants using a Preterite/Imperfective morphology test where participants had to select the correct form of the verb in a narrative context. Individual results revealed that advanced learners of Spanish showed knowledge of the semantic distinction between Preterite/Imperfect sentences in the sensibility judgement task with all lexical classes. In contrast, intermediate learners lacked a semantic differentiation, particularly with achievements and states. For achievements, this finding is unexpected because in English the combination of achievements with perfective or imperfective meaning (e.g. 'the plane arrived/was arriving at the airport') is allowed. A possible explanation, as given by the authors, is that

achievements when used with imperfective meaning have to be coerced. That is, their inherent [+punctual] and [+telic] feature has to be extended. However, less proficient second language learners “might not have the pragmatic ability to coerce” (p. 38) in the foreign language. For states, the lack of semantic differentiation is not surprising, as states are usually only used with imperfective meaning in English. In sum, Montrul and Slabakova (2002) suggest that the “acquisition of morphology precedes acquisition of semantics, and that both acquisitions are gradual developments” (p. 34).

Whereas Slabakova and Montrul (2002) and Montrul and Slabakova (2002) examined off-line processing, Seegmiller, Townsend, Call, Mancini and Ilia (2005) examined the on-line processing of aspectual information. Based on a study by Magliano and Schleich (2000), Seegmiller and colleagues tested EFL learners of languages which either marked aspect explicitly (Russian, Polish, Turkish) or not (Mandarin). Additionally, a control group consisting of English native speakers was included. They were presented short narratives sentence by sentence. Each narrative contained a critical sentence with three variables: grammatical aspect (perfective or progressive), telicity (telic or atelic), and object number (singular or plural), such as *The tornado struck the school with little warning*. A critical question (e.g. *Did the tornado strike the school?*) requiring the participants to make a Yes/No decision appeared either immediately after the critical sentence or three sentences later. Reaction times to these questions were measured. Overall results revealed that native speakers were sensitive to grammatical aspect (with perfective sentences yielding faster response times than progressive sentences), and lexical aspect (with atelic predicates producing faster decision times than telic predicates). L2 learners, on the other hand, showed no significant effect of either grammatical or lexical aspect. Instead, they were influenced by object number, responding faster to sentences containing singulars than plurals. In a second step, language learners were divided into two groups based on whether their L1 marked grammatical aspect explicitly or not. This subsequent analysis revealed a differential response pattern; speakers of non-explicit languages behaved like the native speaker control in that they reacted faster in the perfective condition and slower in the imperfective condition. In contrast, speakers of morphologically explicit languages responded faster in the progressive condition than the perfective condition. Seegmiller and colleagues interpret their findings as showing that “[t]he extent to which the L1 explicitly marks morphological aspect influences the way English-language learners attend to explicit cues in processing English” (slide 26).

However, a methodological issue has to be born in mind when interpreting this pilot study. The test method applied by Seemgiller et al. differs from the test method used in the original study by Magliano and Schleich. Whereas Magliano and Schleich recorded

reaction times to probe words, Seegmiller et al. recorded reaction times to questions about the critical aspect sentence. Note that reaction times to probe words can be easily recorded and their interpretation is straightforward when distractor variables (such as syllable length, letter length, frequency, etc.) are controlled for in the design of the test material. Reliable reaction times to questions, however, are much more difficult to obtain because they must not include the reading time for the question as this would distort the results. Usually, participants either read the question word-by-word and data recording starts after the final word of the question, or participants indicate by button release that they have finished reading the question which triggers data recording. It is not clear from Seegmiller et al.'s presentation whether the recorded reaction times included question reading times. The methodological difference between Magliano and Schleich's study and Seegmiller et al.'s study may have led to the diverging results in response patterns. Remember that Magliano and Schleich observed faster reaction times to progressive sentences than perfective sentences, whereas Seemiller et al. report the opposite effect for their L1 participants. As previous literature on grammatical aspect overwhelmingly supports Magliano and Schleich's results, Seemiller et al.'s findings for native speakers remain unexplained. What is more, their results for L2 learners also need to be interpreted with caution.

In sum, no reliable conclusions can be made about the processing of aspectuality in L2 as data are very scarce. However, first results present interesting findings and open up new questions. Concerning grammatical aspect, a possible influence of L1 has been noted (Seegmiller et al., 2005). Depending on whether aspect is marked overtly in the source language, or not, this influence might result in qualitatively different processing of perfective vs. imperfective sentences in the L2. Concerning lexical aspect, no differential influence of telic vs. atelic predicates was found in L2 (Seegmiller et al., 2005). Concerning the interaction between grammatical and lexical aspect, it has been noted that advanced and intermediate L2 learners do not show a correlation off-line (Salbakova & Montrul, 2002). However, all of these results await further research.

2.2.2.3 Comparing L1 and L2 Processing of Aspectuality

As just mentioned, L2 research on the processing of aspectuality is very limited. Therefore, no reliable conclusions can be made about the similarity and/or differences between the L1 and L2 processing of aspectuality.

However, it can be noted that first results on the processing of grammatical aspect might point to a processing difference between L1 and L2. Whereas in L1 English

comprehension perfective aspect consistently guides readers to focus attention on the end-state of an event and to background it, progressive aspect guides readers to focus on the middle of an event and to foreground it (see Chapter 2.2.2.1). However, in L2 English comprehension, this differential effect seems to be dependent on the reader's L1 and the way aspect is grammaticalised. That is, readers with an L1 ATA system similar to English would be expected to process L2 English in the qualitatively same manner as L1 readers, however, readers with an L1 ATA system different to English would be expected to show processing differences. However, it still needs to be investigated whether this assumption holds for various L1 backgrounds, including German.

Concerning lexical aspect, first results also suggest a processing difference between L1 and L2. So, in contrast to L1 readers L2 readers do not seem to make use of the semantic difference between telic vs. atelic predicates in on-line reading. However, previous comprehension studies suggest that L2 readers make use of lexical content before morphological form in processing sentence meaning (e.g. Lee, Cadierno, Glass & VanPatten, 1997). Therefore, this result is unexpected and needs to be investigated further.

Finally, as regards the interaction between grammatical and lexical aspect, no straightforward comparison can be made between L1 and L2 processing, as L1 investigations solely concentrate on Mandarin Chinese, whereas L2 investigations focus on English. However, first results might indicate that L2 readers are less likely to map form onto meaning (or meaning onto form) in comprehension. Again this finding is unexpected. In L2 writing research a lot of evidence has been accumulated which shows that grammatical and lexical aspect operate in concert (*Aspect Before Tense Hypothesis*). Therefore, more studies addressing the correlation between grammatical and lexical aspect are needed.

A final issue concerns reading and/or language proficiency and its influence on the processing of aspectuality. In L1 processing studies on aspectuality, only reading proficiency (as measured by working-memory) has been investigated. It has been shown that reading proficiency significantly influences foregrounding/ backgrounding of grammatical aspect. In L2 research, however, the role of proficiency (reading and/or language) in on-line processing has not been investigated. However, as first off-line results indicate, language proficiency plays a role in the comprehension of aspectuality. Therefore, its role in the L2 processing of aspectuality should be investigated.

The present thesis aims to contribute to the present line of research by trying to fill these gaps. To this end, an empirical investigation was carried out and in what follows, the empirical research will be presented.

II EMPIRICAL RESEARCH

3 Research Design

3.1 Research Questions

The main goal of this study was to investigate EFL foregrounding/ backgrounding of aspectual information in narrative comprehension by L1 Austrian German readers. More specifically, the present reading study attempted to examine the influence of grammatical and lexical aspect, and their interaction. A previous EFL processing study including other languages (Seegmiller, Townsend, Call, Mancini & Ilia, 2005) has shown a general trend for grammatical aspect, but no effect of lexical aspect. However, so far no reading study has investigated the interaction between grammatical and lexical aspect. Furthermore, L2 proficiency has been neglected.

In sum, the following research questions can be formulated:

- Do L2 readers demonstrate a **foregrounding/ backgrounding** effect of aspectual information during narrative comprehension? If so, does L2 proficiency play a role in this process?
- Does **grammatical aspect** influence L2 foregrounding/ backgrounding during narrative comprehension, and if so, is there an effect of L2 proficiency?
- Does **lexical aspect** have an impact on L2 foregrounding/ backgrounding in narrative comprehension, and if so, does L2 proficiency have an influence on this process?
- Finally, is there an interaction between **grammatical and lexical aspect** in the foregrounding/ backgrounding of aspectual information in narrative comprehension, and does L2 proficiency have an impact on this interaction?

3.2 Hypotheses and Predictions

Based on the reading as well as acquisitional studies discussed in the previous chapters, a number of hypotheses and predictions can be made. In the following section, they are grouped according to the research questions into: the effect of foregrounding/ backgrounding, the influence of grammatical aspect, the influence of lexical aspect, and finally the interaction between grammatical and lexical aspect.

3.2.1 Foregrounding/Backgrounding

A general hypothesis on foregrounding/ backgrounding effects and their constraints can be based on the *Capacity Hypothesis* (Just & Carpenter, 1992). Originally, it was formulated for L1 research, but it has also been applied to L2 studies (e.g. Zwaan & Brown, 1996).

As has been put forward by Just and Carpenter in their *Capacity Theory of Comprehension*, multiple cognitive processes compete for limited working memory resources during reading. These resources enable the reader to activate, for example, words, grammatical structures, phrases or propositions, so that they can be used for further processing. If the reading task does not exceed the amount of resources available, then the reading process is successful. However, "when the task demands are high (either because of storage or computational needs), then processing will slow down and some partial results may be forgotten" (Just & Carpenter 1992, p. 123).

The *Capacity Hypothesis* can be used to make predictions about L2 reading comprehension (Zwaan & Brown, 1996, pp. 290-291). According to the *Capacity Hypothesis*, so-called lower level processes, for example, word recognition, are favoured when working memory is strained. Higher level processes, however, "may be not executed or not executed fully" (Just & Carpenter, 1992, p. 144).

For the present study, it can therefore be expected that language proficiency (for a thorough explanation of how language proficiency was measured, see Chapter 3 on Methods and Chapter 4 on Participants) will have an impact on the foregrounding/ backgrounding of aspectual information. Specifically, the native control group and the L2 proficient readers will have enough processing resources available for the higher level process of foregrounding/ backgrounding, showing in significant mean differences in reading times. Furthermore, the sufficient amount of processing resources should lead to a low error rate. The less proficient L2 readers, on the other hand, should exhibit effects of a strained working memory capacity. Thus, they can be expected to concentrate on lower level processes, resulting in slower decision latencies with no significant foregrounding/backgrounding effect (i.e. no mean difference in reading times). Finally, less proficient readers should demonstrate a higher error rate.

3.2.2 Grammatical Aspect

In L2, the effect of grammatical aspect on the foregrounding/ backgrounding of aspectual information during reading could be hypothesised to be either influenced by the semantic difference between perfective vs. progressive marking, or the relative processing difficulty

(determined by aquisitional order and L1 influence). The hypotheses predict different results.

3.2.2.1 Semantic Information

In L1 research, it has been hypothesised that “information that is tagged as ongoing [i.e. progressive aspect] will be relevant to the subsequent discourse and should have a higher activation level than information that is not tagged as such” (Magliano & Schleich, 2000, p. 99). In accordance with this hypothesis, results for L1 comprehension have shown that progressive aspect is foregrounded, whereas perfective aspect is backgrounded. The question arises whether L2 readers also make use of this semantic analysis of grammatical aspect. If so, L2 readers should also show shorter reaction times for progressive than perfective targets.

3.2.2.2 Processing Difficulty

L2 foregrounding/ backgrounding of aspectual information during reading may, however, also be influenced by the relative difficulty L2 readers experience with the morphological cues marking aspect. This difficulty may be determined by the acquisitional order and L1 influence.

Concerning acquisitional order (see Chapter 2.4.1.2), Bardovi-Harlig and Comajoan (2010) summarize that many studies support the view of a universal acquisitional order for tense-aspect marking across L1 backgrounds. In this view, past tense perfective marking appears before past progressive marking (p. 388). Based on this acquisitional difficulty, it can be hypothesised that less proficient L2 readers will show longer reaction times for past progressive than past perfective marking. Proficient L2 readers as well as the native control group, on the other hand, should show no such distinction.

Regarding L1 influence (see Chapter 2.4.2.2), Seegmiller et al. (2005) have hypothesised that the “extent to which the L1 explicitly marks morphological aspect influences the way English-language learners attend to explicit cues in processing English” (p. 26). The authors found that L2 readers whose L1 did not mark grammatical aspect morphologically, demonstrated longer decision latencies for progressive than perfective aspect. As German does not mark grammatical aspect overtly, this would render the prediction that less proficient L2 readers take longer to respond to progressive than perfective targets. Proficient L2 readers and the L1 control group, however, should not show such a trend.

Thus, in the present study, hypotheses based on the acquisitional order and L1 influence both predict longer reaction times for progressive than perfective targets for less proficient L2 readers. It would, therefore, not be possible to keep apart the relative influence of each factor.

3.2.3 Lexical Aspect

In L1 an effect of lexical aspect on foregrounding/ backgrounding has been noticed (Seegmiller, Townsend, DeCangi, & Thomas, 2004; Townsend, Seegmiller, Call, Musial, & Mancini, 2005). It has been hypothesised that lexical aspect influences processing at the discourse level (but not the word level), in that telic verbs are foregrounded. In L2, on the other hand, no significant effect of lexical aspect has been noted (Seegmiller, Townsend, Call, Mancini, & Ilia, 2005). It can, therefore, be predicted that the L1 control group will show significantly faster reaction times for accomplishment than activity predicates. The proficient L2 group should approach L1 performance. However, the advanced and intermediate L2 groups should show no effect of lexical aspect.

3.2.4 Grammatical and Lexical Aspect

Acquisitional data for L1 (see Chapter 2.4.1.1) as well as L2 English (see Chapter 2.4.1.2) seem to point to an interdependence of grammatical and lexical aspect in the emergence of temporal marking. This interdependence has most poignantly been described in the *Aspect Hypothesis* (Andersen & Shirai, 1994), which states that past perfective marking first occurs in accomplishments and only then activities, whereas (non-past) progressive marking first shows in activities and only then accomplishments. Proficiency has emerged as a possible factor influencing the distributional bias. As has been pointed out by Robison (1995) the bias strengthens with proficiency (p. 356).

For the present study it could, therefore, be hypothesised that accomplishments are foregrounded when marked with perfective aspect, whereas activities are foregrounded when marked with progressive aspect. Native readers and the proficient group should, therefore, show evidence of the distributional bias by demonstrating a significant difference in reaction times, whereas less proficient L2 readers should show a smaller or no difference.

However, some L2 researchers voiced critique with respect to the *Aspect Hypothesis*. Such a critique has also been raised for L2 English learners from an L1 German background. Rohde (1996), for example, commented on the differential affiliation of perfective vs. progressive marking with accomplishments vs. activities by saying that the

“distributional bias is not necessarily reflected in acquisitional data” (p. 1130). Thus, the question arises whether the *Aspect Hypothesis* can at all be extended to L2 reading.

3.3 Method

3.3.1 Vocabulary Size Test

As has been argued in Chapter 1.2.3, EFL proficiency is a fundamental component of EFL reading ability. For the present study it was, therefore, important to control for this factor.

Due to the limits of the present study, general language proficiency was estimated using a vocabulary size test. Vocabulary knowledge was chosen as a measure, because: first, vocabulary knowledge has proved to be a stable predictor of foreign language proficiency (Meara & Jones, 1988), and second, vocabulary knowledge has been demonstrated to have a higher impact on reading comprehension than grammatical knowledge (Anderson & Freebody, 1981; van Gelderen et al., 2004).

The proficiency measure used in the present study was Laufer and Nation's (1999) *Vocabulary-Size Test of Controlled Productive Ability*. The test is an **off-line**, **quantitative** measure assessing the dimensions of breadth and production (Henriksen, 1999 for a discussion of the three dimensions of vocabulary knowledge). The **breadth** dimension is an approximate measure of a participant's total vocabulary size. It is measured by a sentence fill-in task, using vocabulary from five different frequency bands (see Chapter 4.1). The **production** dimension measured is written production. Importantly, the production is controlled. Laufer and Nation (1999) used the term 'controlled productive ability' as referring to “the ability to use a word when compelled to do so by a teacher or research, ... in a constrained context such as a fill-in task” (p. 37). For the present study a production task was deemed most suitable. This is because reading comprehension involves the construction of meaning, and a production task does not only measure morphological knowledge, but also semantic knowledge associated with a particular word. A vocabulary test using word recognition as a measure of vocabulary size, however, “only demands the ability to recognize formal features; the learner may or may not reflect on meaning” (Henriksen, 1999, p. 305).

The **data** collected were individual scores on the five frequency levels which provide a “very rough indication of the number of words known at that level” (Laufer & Nation, 1999, p. 41). Moreover, participants total scores for all levels were recorded.

However, there remain **problems** with using vocabulary size tests which are based on a frequency count (Nation, 1990). First, the results gained depend on the size of the frequency corpus used. Thus, the smaller the corpus, the less reliable the results get, especially for readers of an advanced level. Second, the frequency of a word depends on the material used for the corpus. This is especially problematic for studies in L2 acquisition as the corpora used are usually made up of material used by L1 readers. Thus, they might not reflect L2 exposure. A final disadvantage in using a vocabulary task, is that participants could make use of L1 – L2 cognates.

These limits notwithstanding, vocabulary size measures have shown high correlations with reading comprehension and are a valuable estimation of language proficiency.

3.3.2 Priming Study

The method used for the present thesis was adapted from Magliano and Schleich (2000). Specifically, Experiment 3 was used as a basis. The study can be described as a **on-line priming study** (p. 99). In a priming study participants are most commonly presented with a prime, such as a word, which is followed by a target word. Participants then have to respond to the target word by a lexical decision task or by naming. The method used in Magliano and Schleich's Experiment 3 is an elaboration of the priming technique. The prime is presented in form of a sentence which itself is part of a short story. In one version of the experiment the prime is presented in the perfective aspect, in the second version the prime is presented in the progressive aspect. In the present study, the target appeared three sentences after the presentation of the prime. The target consisted of the base form of the verb and the object describing the activity depicted in the priming sentence. Participants had to decide as quickly and as accurately as possible whether the target words had appeared in the story they were currently reading, or not.

The **data** collected were reaction times and response accuracies to the target words. These two measures are considered to provide information on the maintenance of the activation level of information and hence the processes of foregrounding and backgrounding.

However, there is a **disadvantage** of this technique for reading studies. The method is new in reading studies and has not been validated. Especially for L2 readers, it is not clear whether the data gained are primarily a result of situation model construction or merely a result of word recognition effects and lexical access. Nevertheless, this method has been used in the present study as this is the only technique available measuring the foregrounding/ backgrounding of activities during situation model construction by

specifically examining reactions to verbs instead of characters (Carreiras, Carriedo, Alonso & Fernández, 1997), objects (Truitt & Zwaan, 1997), locations (Ferretti, Kutas, & McRae, 2007), or pictures (Madden & Zwaan, 2003). Furthermore, Magliano and Schleich's (2000) results are consistent with the above mentioned research on the processing of grammatical aspect. This suggests the validity of the method.

3.4 Participants

A total of twenty-eight subjects participated in the study. Based on their language acquisition history and their proficiency level (as measured by the Vocabulary Size Test, see Chapter 7.1.2) they were grouped into four. Group 1 comprised native speakers from America (n = 4) and Jamaica (n = 1), 2 female and 3 male, who were between the ages of 25 and 34. Their average age was 29 ± 3.85 years. Group 1 did not take the Vocabulary Size Test. The Vocabulary Size Test was originally designed for foreign language learners and for the present group of native English speakers, it was, therefore, deemed to be too easy. Groups 2-4 consisted of EFL readers with Austrian German as their L1. The groups were formed based on participants' scores on the Vocabulary Size Test. Thus, Group 2, the proficient group, included 4 female participants aged between 24 and 27 with a mean age of 25.38 ± 0.86 years. Their scores on the Vocabulary Size Test ranged between 80 and 84. Group 3, the advanced group, was made up of 7 female and 3 male participants between the ages of 22 and 27 with an average age of 25.56 ± 1.67 years. Their scores on the Vocabulary Size Test ranged from 55 to 67. Group 4, the intermediate group, consisted of 8 female and 1 male participant between the ages of 21 and 36 with a mean age of 26.63 ± 4.34 years. Their vocabulary scores ranged from 35 to 51.

3.5 Materials

The materials for this study consisted of two parts. First, the Vocabulary-Size Test of Controlled Productive Ability developed by Laufer and Nation (1999) was used. The test served as a measure of participants' EFL proficiency. Second, a priming study was conducted for which short stories including target stimuli and distractors were developed.

3.5.1 Vocabulary-Size Test

Laufer and Nation (1999) developed four parallel versions of their Productive Vocabulary Levels Test (Versions A, B, C, and D). As Version C is recommended not only for diagnostic purposes but also for test/retest purposes (p. 44), Version C was used. More

specifically, of the two equivalent versions of Version C, Version 1 was used. It can be found in the Appendix of Laufer and Nation (pp. 46-48). For the present study, the test was typed up on a computer and slight changes in format were made, including the deletion of subheadings giving information on the frequency band tested.

The test is a sentence fill-in task where the first letters of a target word are provided in order to elicit the whole test word (e.g. *I'm glad we had this opp___ to talk*. or *There are a doz___ eggs in the basket*.). The number of first letters is the "minimal number of letters that would disambiguate the cue" (p. 37). In the present study, the first letters of each target stimulus were marked yellow in order to facilitate test item recognition on the computer screen and to enable participants to recognize left out or missing items. The first letters are followed by an underlined space. Importantly, the size of this underscore provides no clue as to the number of letters of the target word.

The test items are grouped into different frequency bands. This was done using various corpora: the Thorndike and Lorge List (Thorndike & Lorge, 1944), the General Service List (West, 1953), the Computational Analysis of Present-Day American English (Kucera & Francis, 1967), and university specific vocabulary from Campion and Elley (1971) (Nation 1990, p. 264). The frequency bands used in Laufer and Nation (1999) include five levels: the 2.000, 3.000, 5.000, 6.000+ (also called the University Word List) and 10.000 word level. The 2.000 word level contains the 2.000 most common words in written texts. These make up the majority of all words found in written texts, namely 79.7%. The 3.000 word level includes the 3.000 most common words, excluding the 2.000 word level. These account for 4.3% (Laufer & Nation 1999, pp. 35-36; Nation, 1990, p. 264). Together, the 2.000 and 3.000 word levels "contain high-frequency words" (Nation, 1990, p. 261). The 5.000 word level contains the most common 5.000 words, excluding the 4.000 word level. It makes up 1.9% of all vocabulary items found in written texts (Laufer & Nation, 1999, p. 36) and it is "on the boundary of high- and low-frequency words" (Nation, 1990, p. 261). The University Word List (UWL) contains a selection of words from university textbooks (Nation, 1990, p. 264). It is assumed to contain the 6.000+ most common words, as the UWL excludes words from the 5.000 word level. It "represents one type of specialized vocabulary" (Nation, 1990, p. 261). The 10.000 word level includes the most common 10.000 words, excluding the 9.000 word level. No information is provided on the frequency of occurrence for this level. However, it is certain that the "10,000-word level contains low-frequency words." (Nation, 1990, p. 261).

As has been described above, each frequency band is representative of 1.000 words. As an example consider the following calculation for the 3.000 word level:

the most common 3.000 words – the most common 2.000 words = 1.000 words

An exception to this is the UWL. It only contains 836 words. Nonetheless, all five word levels are tested in the Vocabulary Size Test via groups of 18 items. This amounts to a total of 90 test items.

3.5.2 Priming Study

As mentioned previously, the present study adopted a priming method developed by Magliano and Schleich (2000). Because the participants of the present study came from a non-English L1 background, the short stories created by Magliano and Schleich could not be used. First, these stories included too many low frequency words which would have interrupted the participants' comprehension process. The aim of the present study, however, was to test the L2 processes of foregrounding/ backgrounding as they occur during comprehension. Moreover, L2 specific word recognition processes affecting reaction times had to be taken into account. In order to control for any L2 specific confounding variables, the stories developed for the present study, had to meet a number of criteria.[5]

3.5.2.1 Prime and Target Stimuli

Material development started out with the choice of target stimuli (base-form verb + object) and the corresponding sentence prime in the perfective and progressive aspect (see Table 5.1).

5 I sincerely want to thank Prof. Joseph P. Magliano for sharing his test material. Reading the stories enabled me to thoroughly understand the study and helped me in writing my own test material.

Prime	TF	Prime	TF	Target	LFV	LFN
Nick crossed the street.	31	Nick was crossing the street.	14	cross street	70	243
Mark packed the bag.	18	Mark was packing the bag.	5	pack bag	33	75
Sandra cooked the meal.	9	Sandra was cooking the meal.	11	cook meal	37	67
Alex changed the floor.	109	Alex was changing the floor.	36	change floor	273	127
Nancy washed the dress.	19	Nancy was washing the dress.	11	wash dress	49	48
Sam climbed the tree.	24	Sam was climbing the tree.	13	climb tree	57	147
Cathy learned the part.	46	Cathy was learning the part.	38	learn part	193	612
Mike played the drum	112	Mike was playing the drum.	101	play drum	386	16
Amanda pushed the car.	50	Amanda was pushing the car.	23	push car	107	353
Natalie pulled the rope.	70	Natalie was pulling the rope.	24	pull rope	140	22
Alex watched the cat.	67	Alex was watching the cat.	65	watch cat	202	55
Sam touched the leg.	30	Sam was touching the leg.	10	touch leg	69	118
Dan kissed the girl.	18	Dan was kissing the girl.	6	kiss girl	36	254

Table 5.1: Primes and Targets for all Stories, including Type Frequency (TF) and Lemma Frequency (LFV) for Verbs, and Lemma Frequency (LFN) for Nouns

A number of criteria were developed for verb and object stimuli. Regarding **verb stimuli**, a list of potential items was compiled using the *Compact Oxford English Dictionary of Current English* (2005). Because of the research question, stimuli first had to be controlled for **lexical aspect**. Thus, only stimuli depicting accomplishments and activities were chosen. Moreover, activity verbs also had to be controlled for verb **valency**. Target items were always presented in the form 'verb + object'. Therefore, only primes in monotransitive use could be included in the test material. Monotransitive verbs take “one and only one object” (Chalker & Weiner, 1998), which typically takes the semantic role of a patient (Matthews, 2007).

Furthermore, **no multi-word verbs** were included in the test material. Multi-word verbs appear “together with a PARTICLE (or two particles) functioning as a single verb” (Chalker & Weiner, 1998). They include phrasal verbs (e.g. *use up*), prepositional verbs (e.g. *look after*), and phrasal-prepositional verbs (e.g. *looking forward to*). Multi-word verbs were excluded because the target would be underspecified and potentially ambiguous. For example, *use soap* could stand for *She used soap* or *She used up the soap*. In the same manner *look baby* could stand for *He looked at the baby* or *He looked after the baby.* This potential ambiguity might have resulted in longer processing times.

Moreover, target verb **regularity** was controlled for. Regular and irregular English verb forms have been shown to lead to differential processing in bilinguals. For example, Basnight-Brown, Chen, Hua, Kostić, and Feldman (2007) carried out a cross-modal priming study with L1 Serbian and L1 Chinese readers investigating English inflectional

processing. The test material consisted of irregular nested stem (e.g. drawn – draw), irregular change stem (e.g. ran – run), and regular past tense–present tense verb pairs. Results demonstrated that "[w]hereas the native speakers of English showed no differences in facilitation between the regular and irregular verbs ... non-native speakers of English revealed numerical differences between the two types" (p. 76). As only regular verbs showed comparable priming across native and non-native readers, this verb form was chosen for the present study.

From within the group of regular verbs only orthographically and phonologically **transparent** verbs were chosen. These are "[m]orphological formations whose base morphemes retain their pronunciations (and spellings) under affixation" (Stolz & Feldman, 1995, p. 109). Opaque forms were excluded because they "pose a nontrivial problem" (Chialant & Caramazza, 1994, p. 61) for a parser. Thus, items with consonant doubling (e.g. *rub – rubbed*) were not included. They present a case of phonological transparency, but not orthographic transparency. Likewise, it was aimed to exclude verbs ending in [e] (e.g. *dance – danced*), as they too lack orthographic transparency. However, the test stimulus *change* had to be included in the test material as no other alternative stimulus was available when considering the other criteria.

As concerns **object stimuli**, they were first controlled for **number**. Only items in the singular were presented. This criterion was applied as Seegmiller, Townsend, Call, Mancini and Ilia (2005) reported processing differences between singular and plural objects in L1 English as well as L2 English. Seegmiller and colleagues carried out a pilot study in which they wanted to extend Experiments 1 and 2 of Magliano and Schleich's (2000) original study. They found that response times were "faster with singular than with plural objects for immediate probes" (Seegmiller et al., 2005, slide 14) and hypothesized that "contexts that allow fewer options" (slide 26) lead to faster reaction times.

In addition to these specific criteria used for either verb or object stimuli, also common criteria were applied. First, two measures of **word length** were used, namely length in syllables and length in letters. Syllable length is an important factor as the syllable is argued to constitute the unit for parsing in the dual mechanism model (Pinker, 1991) and the parallel-dual rout model (Schreuder & Baayen, 1995). Thus, processing a polysyllabic word may be more complex and therefore more time consuming than processing a monosyllabic word. Therefore, only verb and object targets containing a single syllable were included in the test material. Word length as measured in letters is also a confounding variable. As Harley (2001) points out, "[i]t seems that the number of letters in a word has little effect for short words, but has some effect on words between 5 and 12 letters long" (p. 148). Therefore, only words containing a small number of letters were

used: verb targets ranged between 4 – 6, and object targets were between 3 – 6 letters long.

Moreover, verb and object stimuli were controlled for **frequency**. Frequency is a major confounding variable in word recognition experiments because “[c]ommonly used words are easier to recognize and are responded to more quickly than less commonly used words” (Harley, 2001, p. 146). For the present study the lemmatized written frequency corpus compiled by Leech, Rayson and Wilson (2001) was used. The lemma frequency for verb targets ranged between 36 – 386 and the lemma frequency for object targets was between 16 – 612 (see Table 5.1). Thus, only middle and high frequency verbs and high frequency nouns were used.

Finally, **no time adverbs** (e.g. *yesterday*) **or adverbials** (e.g. *an hour later*) appeared in the prime sentence. The reason for excluding time adverbs and time adverbials comes from insights gained from L2 comprehension and processing studies. In an overview of verbal morphology comprehension strategies in L2, Bardovi-Harlig (2000) refers to experiments conducted by Boatwright (1999) and Lee (1999). Boatwright carried out an on-line semantic judgement task in which participants heard single sentences. They had to decide whether the sentences were true about the future, the present or the past. Results showed that the “presence of a temporal adverbial facilitated more correct answers and faster reaction times” (Bardovi-Harlig, 2000, p. 43). Support comes from Lee, who studied the comprehension and processing of the Spanish preterite. He found that the “comprehension strategies of some learners may focus their attention away from processing the information carried by the verbal morphology” (Bardovi-Harlig, 2000, p. 44). In sum, the studies agree that L2 learners of a lower proficiency primarily rely on lexical cues instead of morphological cues. In order to focus participants' attention on verbal inflections, time adverbs and time adverbials had to be excluded from the aspect and post-aspect sentences.

3.5.2.2 Short Stories

The short stories used in the priming study were especially written for the present thesis. The criteria used for developing these stories were mainly adopted from Magliano and Schleich (2000). Additionally, findings from other reading time studies were also considered. Taken together a number of criteria were used in order to control for story content, structure and function, and narrative relevance of the primes.

Content

The aim of the present thesis was to study reading comprehension as it occurs during narrative comprehension. Therefore, a primary concern in developing the test passages was to have a thematic point and well-rounded short story. Following Magliano and Schleich (2000), Dyer's (1983) Thematic Abstraction Units (TAU) were used for story development (see Table 5.2 for an overview of the TAUs used) .

Story Title	TAU
Risky Behaviour	Too Risky / Made Worse
Unfulfilled Hopes	Unsupported Plan
Fateful Invitation	Made Worse / Greater Harm
Disappointed Expectations[6]	Unsupported Plan
Annoying Stain	Made Worse
Breach of Trust	Greater Harm
The Audition	Too Costly
Bearing the Consequences	Vulnerable
The Breakdown	No Expectation or Goal Failure
The Competition	No Expectation or Goal Failure
The Wrong Decision	Too Late
Hidden Blessing	Hidden Blessing
The Lousy Boyfriend[7]	Red-Handed

Table 5.2: TAUs Used for Each Story

Put simply, TAUs can be compared to adages (Dyer, 1983, pp. 27-28), such as *Every cloud has a silver lining.* Interesting for the present research context is that many adages have translation equivalents in other languages. The adage above, for example, can also be found in German: *Auf Regen folgt Sonnenschein*. Therefore, TAUs provide plots which participants from different language backgrounds can relate to.

More specifically, TAUs “contain an abstracted planning structure” (Dyer, 1983, p. 29). A planning structure is used by readers while they process stories. It represents a situation – a character's goals, plans and expectations – and a situation outcome. It is abstract, because TAUs do not include specific characters, locations or specifications of time. In order to illustrate how TAUs were used in the present study, consider the test story *Hidden Blessing* and its corresponding TAU (as shown below).

6 The idea for *Disappointed Expectations* was taken out of Dyer (1983: 47).
7 *The Lousy Boyfriend* was adapted from Magliano & Schleich (2000).

HIDDEN BLESSING

Sam wanted to go to a music festival with his friends.
But he broke his leg.
So he had to stay at home.
Sam touched the leg.
Sam was touching the leg.
He was dreaming about the festival.
There would be every band he loved.
He felt miserable.
touch leg
The next day he got a call.
His friends had had a serious accident.
have accident
After all, Sam was happy he only had a broken leg.
tie shoe

TAU-HIDDEN-BLESSING

X experiences a goal failure, caused by an event E.
X has a realization that E also enables (or causes) another goal to succeed.
(Dyer, 1983, p. 43)

In the test story *Hidden Blessing*, X is represented by Sam whose goal it is to drive to a music festival. However, he cannot reach his goal, because he breaks his leg (event E). Sam has to stay at home and his friends go without him. Later, Sam hears about a serious accident his friends had, and he realizes that his misfortune enables him to escape from a greater harm, namely a dramatic deterioration of his health.

Structure and Function of Story Segments

In order to facilitate the processing of the thirteen stories, each story began with a **title** written in capital letters. This enabled participants to distinguish stories from each other easily, and thus served as an effective way to structure the material.

Each story started out with an **introduction** which was between three and six sentences long. In the introduction the main character and any side characters were established. Moreover, the introduction set the story background for the critical aspect sentence, explaining a character's goal and motivation.

The introduction was followed by the **aspect sentence**, which was either presented in the perfective or progressive aspect. After the aspect sentence, **three post-aspect sentences** followed. A thorough description of the three post-aspect sentences is crucial for understanding what data were collected and which results were gained. Excluding the practice story which was not analysed, sixty-four percent of the post-aspect sentences

were psychological, perceptual or mental states (e.g. *wanted to wear*, *felt like a little revolutionary*, *was worried*). Seventeen percent were perfective activities, eight percent were perfective accomplishments, five percent were progressive activities, and the remaining six percent were made up of one perfective achievement verb and one perfective act. Within these, seventy-five percent of the first post-aspect sentences contained a state. The remaining predicates were made up of one perfective achievement, as well as one perfective and one progressive activity. As can be seen, the majority of post-aspect verbal phrases were states. Thus, importantly, primes were mostly followed by background clauses (Hopper, 1979, p. 215). As background information does not contain crucial information for the story line, it does not compete for attention with the aspect sentence and readers can keep the aspect sentence in focus.

Each story ended with a **conclusion** which varied between two and five sentences. The function of the conclusion was to either show that a character's expectation was met (e.g. *The Competition*), or disappointed (e.g. *Unfulfilled Hopes*); or that a character's goal was failed (e.g. *Risky Behaviour*), or achieved (e.g. *The Breakdown*). The function depended on the TAU used.

Narrative Relevance of Primes

Accessibility, and thus reading time, is influenced by a reader's **focus of attention**. Attention is directed toward relevant content (Carreiras, Carriedo, Alonso, & Fernández, 1997), which can be emphasised by linguistic cues (Gaddy, van den Broek, & Sung, 2001). In order to control for the narrative relevance of primes, several co-textual criteria had to be fulfilled.

With regards to the **content** of the actions depicted by primes, they were first controlled for relevance. This is because accessibility of an item is also determined "by its importance to the main sequence of events in the narrative" (Carreiras et al., 1997, p. 438). In *The Breakdown,* for example, the prime is *pushed/ pushing a car*, but not *washed/ washing the car* which could be an imaginable action carried out by the protagonist Amanda before leaving to visit her grandmother.

Second, the events described between the aspect sentence and the three post-aspect sentences were controlled for situational continuity, so that there was no shift in time, space or protagonist. A shift in these content related variables would have resulted in the updating of the situation model making the new information the focus of attention (Rinck & Weber, 2003). Targets referring back to these old situations would have elicited longer latencies.

Furthermore, **linguistic devices** were used to put primes into focus. First, target stimuli actions were always carried out by the protagonist. This criterion is based on the assumption that “main characters ... are more prominent and accessible than are secondary characters, introduced by role names” (Carreiras et al., 1997, p. 439). Moreover, each story began with the name of the main character. This is because “first-mentioned characters are more accessible than are second-mentioned characters” (p. 439). Importantly, the main character was not only put in focus at the beginning of the story. S/he was also in focus throughout the post-aspect sentences.

Side characters, on the other hand, were mainly referred to by their role name (e.g. *mother-in-law*). Only in two stories side characters were given names, however, they were not put in focus, as they were referred to in relation to the protagonist by a possessive pronoun (e.g. *Dan and his girlfriend Nancy*). Additionally, in *The Wrong Decision* the side character was even non-human and, therefore, automatically backgrounded (Wårvik, 2004, p. 101).

Second, prime object stimuli were always coherent within the story and never had to be inferred by the reader. They were always introduced by non-cataphoric devices in the form indefinite article *a/an* + noun (e.g. *a tree*), definite article *the* + noun (e.g. *the rope*), or personal pronoun *his/her* + noun (e.g. *his drum*). Thus, the objects described were always presented as specified forms and never as underspecified pro-forms. Subsequently, they were referred to with an anaphoric device in the form definite article *the* + noun (e.g. *the tree, the rope, the drum*) pointing backwards to previously mentioned entities. Prime object stimuli were controlled for coherence because first, objects which have to be inferred, are more difficult to process and elicit longer reaction times (Singer, 1979). Second, anaphoric devices are processed differently from cataphoric devices, with cataphoric devices gaining a “privileged status” in mental representations (Gernsbacher & Jescheniak, 1995, p. 24).

3.5.2.3 Distractors

As has been described in Chapter 3.2, the present study is a priming study. As such it contains primes and targets (see Chapter 5.2.1) as well as distractors. Primes always occur before targets or distractors. The effect they have on processing is of interest for the research question. In the present experiment, sentence primes were used, such as *Cathy learned the part* or *Cathy went to bed very late*. Targets or distractors are presented later. They are the items to which participants are asked to respond. Response times and/or response accuracies are collected to measure the effect of the corresponding prime

and/or to test attention. In the present experiment, targets and distractors contained a base form verb + object, such as *learn part* or *go bed*. The crucial difference between targets and distractors is that targets are of real interest to the researcher, whereas distractors are only used to conceal the purpose of the study from the test participants in order to avoid strategic behaviour. Moreover, targets always have a corresponding prime (e.g. *learn part* and *Cathy learned the part*.), whereas distractors may have a corresponding prime (e.g. *go bed* and *Cathy went to bed very late*.), but they need not do so. Unprimed distractors are test words, which are read by participants for the first time.

Although distractors are only used to shift away attention from the research question, they have to be carefully selected in order not to influence the test result. Important decisions have to be made about their form, number of occurrence, required response, place of occurrence, and meaning.

The distractors used in Magliano and Schleich (2000) had the same form as the targets and consisted of the base form verb + object. Their total number was 49, spread across 20 test stories. Per story 2 – 4 distractors appeared. Their place of occurrence is not stated explicitly. 30% of the distractor primes had actually occurred in the stories, whereas the remaining 70% were “completely unrelated to the story” (p. 100).

In the present study, similar criteria were used for the distractors. A total of 20 distractors were used for the 13 stories (see Table 5.3). In an attempt to facilitate a fluent reading process, however, only 1 – 2 distractors appeared per story. 10 distractors appeared in the introduction, 5 of them were correct, 5 were incorrect. The remaining 10 appeared in the conclusion, again 5 were correct and 5 were incorrect. Importantly, a distractor never appeared after the three post aspect sentences. Following Magliano and Schleich distractors were initially not related to the stories.

Story	**Distractor**	Story	**Distractor**
Practice	buy bread, move table		
1	book room	7	stroke dog, take instrument
2	build house, include nuts	8	visit grandmother, drink milk
3	finish school	9	feed horse
4	go theatre	10	have breakfast
5	be unpopular, draw picture	11	have accident, chew gum
6	go bed	12	spot girl, fly plane

Table 5.3: Distractors Used for All Test Stories

3.5.2.4 Programming in Psyscope

The test material was entered into the software programme PsyScope X B53 (Cohen, MacWhinney, Flatt, & Provost, 1993). The graphic interface was used to program the experiment. As can be seen in Figure 5.1, the first component in the experimental hierarchy was the experiment. Then, sixteen block icons followed which can be identified in the Figure as i_1, pb, 1b, 2b, 3b, 4b, 5b, 6b, i_2, 7b, 8b, 9b, 10b, 11b, 12b, and i_3. These block icons were connected to sixteen template icons. The template icons contained the texts of all the instructions (Instruction 1, Instruction 2 and Instruction 3), the practice story (Practice) and the test stories (1-12). This design is unusual, as blocks are normally used to present a number of trials together. However, the conventional design repeatedly produced an error message. In order to work around this bug, this new design had to be used.

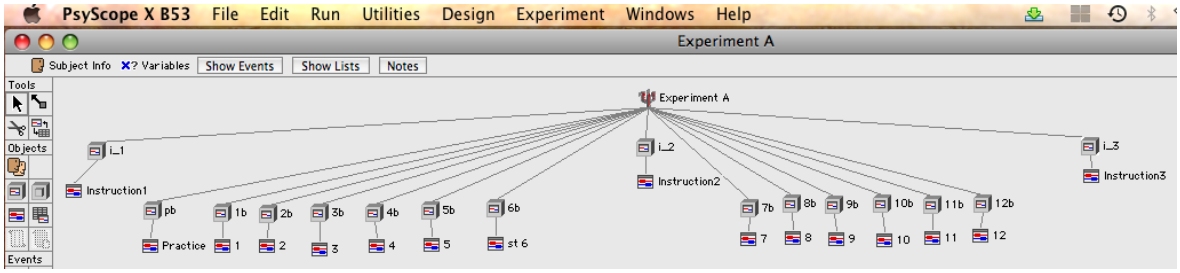


Figure 5.1: Graphic Interface of Experiment A in PsyScope

3.5.3 Pilot Testing of the Material

Before the study was carried out with a large number of participants, the material was piloted on a twenty-five year old female L2 English reader with Austrian German as her L1. Care was taken to choose an intermediate reader (vocabulary size score = 36) to ensure that the material was also suitable for less proficient participants.

The reader was naïve as to the aim of the study. She received the same instructions (see Appendix) as the participants proper. However, after the experiment, the reader was interviewed about any comprehension problems, ease of intake, and reading strategies used.

The interview showed that the reader had no major comprehension problems which would disrupt understanding of the overall content of the stories. However, she found that the ease of intake was slightly interrupted in *Breach of Trust*, because the story used to include a distractor, she found very difficult to respond to (*be unpopular*). Furthermore, she acknowledged that her reading strategy led her to a rather superficial target response, where she primarily concentrated on the object in the target word pair, leaving the verb

fairly unanalysed. According to her, this superficial response was enhanced by distractors, which were completely unrelated to the story.

As a result, the distractors were revised. First, the distractor *be unpopular* was substituted with *throw party*, which only includes an irregular stem change and is thus easier to process. Second, target response was made more difficult. As illustrated in Table 5.4, all distractors which were completely unrelated to the stories were substituted with distractors which were possible associations to the story content read. This was done using the Edinburgh Associative Thesaurus (EAT) (Kiss, Armstrong, Milroy, & Piper, 1973), which contains L1 empirical word association data to a large number of lexical stimuli. Eight noun stimuli were picked out of the stories. Further two stimuli which were not literally present in the stories (*apartment, motorway*) were also chosen. These were inferences which have to be drawn when reading the stories. Then associations were selected out of which distractors were developed. These were used in the experiment proper.

Story	Stimulus	Association	Occurrence	Distractor
Practice	doctor	medicine	6%	buy medicine
	arm	hand, wave	11%, 1%	wave hand
2	mother-in-law	house	1%	build house
3	house	dog	1%	get dog
5	spy	hat	2%	wear hat
7	*apartment*	lift	1%	use lift
8	*motorway*	trees	1%	see tree
9	sport	running	2%	run mile
11	leg	shoe	1%	tie shoe
12	drink	eat	4%	eat cake

Table 5.4: Revised Distractors for All Test Stories with Possible Inferences Highlighted in Italic

3.6 Procedure

3.6.1 Vocabulary Size Test

The Vocabulary Size Test was sent to all L2 English participants via e-mail. An instruction was written in German at the beginning of the test: “Bitte ergänze die mit Gelb markierten Wörter. Versuche auch Wörter zu ergänzen bei denen du dir in der Rechtschreibung nicht sicher bist. Der Gebrauch von Wörterbüchern würde die Ergebnisse verzerren und ist daher nicht erlaubt.”

3.6.2 Priming Study

All participants were tested individually. L2 readers were seated in a quiet room (in an apartment or a library), however, L1 readers were tested in a slightly louder environment (in a tutoring institute or a café). The experiment started with an oral instruction in the participants' L1. Participants were told that they would read thirteen short stories, which would be presented sentence by sentence. Further, they were informed that each story would begin with a title in capital letters. In order to proceed reading, they were instructed to press the enter button marked yellow. Participants were also informed that sometimes two words would flash up on the computer screen and that they would have to decide as quickly and as accurately as possible, if the two words had already appeared in the story they were reading. They were asked to press the green button for 'yes' and the red button for 'no'. Importantly, participants were instructed to put and leave their index fingers on the green and red buttons and their middle finger on the yellow button while they were reading the stories. Moreover, participants were asked to read the stories as if they were reading a story for enjoyment and it was stressed that participants should find their own pace of reading the test sentences without letting themselves be influenced by the fast sentence presentation on the screen. Finally, participants were told that there would be a short break in the middle of the experiment to give them time to relax their eyes. However, they were also allowed to make a break at the beginning of any story. After the oral instruction, any remaining questions were answered and it was made sure that participants had fully understood the task.

Then the experiment was started on the laptop. The material was presented visually on a Macintosh MacBook. First, participants read a written instruction in English (see Appendix). The instruction was followed by the practice story. As all stories, the practice story was preceded by a pause of 4000 ms which was followed by a cross (+) for 250 ms. The cross was situated in the middle of the screen and had the purpose of drawing participants' attention to the presentation point of the test sentences. Sentence reading was self-paced. There was a 750 ms interval between the end of a sentence and the start of a target stimulus. Participants pressed the q-button when they thought the words had appeared in the previous sentences and the +-button when they thought the words had not appeared in the story before.

After the practice story a short feedback was given to the participants. They were informed whether their responses to the two word pairs were correct or incorrect. Furthermore, it was again stressed that they should find their own reading speed in an attempt to understand the whole story. Participants were then left to read on their own, however, the experimenter answered most questions which came up during the

experiment. One repeatedly asked question was whether always both target stimuli (e.g. *cross street*) were either correct or incorrect. This question was left open in order to avoid strategic reading.

The practice story was followed by Experiment 1 which consisted of six test stories. There were two test versions of Experiment 1: Version A and Version B. These differed with regard to the aspect sentence (see Table 6.1). At the end of Experiment 1 there was a break of one minute. Afterwards, Experiment 2 was presented automatically. Experiment 2 also comprised six stories. Here too, Version A and Version B differed in respect of the aspect sentence.

	Grammatical Aspect											
Version	Experiment 1						Experiment 2					
A	P	I	P	I	I	P	I	P	P	I	P	I
B	I	P	I	P	P	I	P	I	I	P	I	P

Table 6.1: Perfective (P) and progressive (I) Prime Sentences per Story in Experiments 1 and 2 for Versions A and B

4 Results: Vocabulary Size Test

4.1 Scoring

Laufer and Nation (1999) describe their scoring procedure in the following way: “The grading was in terms of correct/incorrect for each item. Minor spelling mistakes were not marked as incorrect, and grammatical mistakes were also ignored.” (pp. 38-39). These main criteria were also applied in the present study, however, additional criteria had to be established.

First, some cues elicited **multiple semantically appropriate answers,** but not all of them were counted as correct. For example, the cue in the test sentence *There are several misprints on each page of this te__.* triggered four different answers. They included *text*, *test*, *testament* and *telegram*. An appropriate context for the four versions can be imagined easily and no other criteria were violated. Therefore, all four versions were counted as correct. However, several sentences contained cues which elicited multiple semantically appropriate answers, but violated co-occurence expectations. For example, the cue in *Her beauty and cha__ had a powerful effect on men*. prompted the target *charm*, but also the responses *character* and *charisma*. As command of native like word associations serves as a parameter to evaluate vocabulary knowledge (Zareva, 2005, p.

549), the decision was taken in the present study to count such instances as incorrect. Second, **spelling mistakes** were divided into two classes. Target items which were misspelled as **sooth* or **homogenous* were marked as correct. However, responses such as *motif* instead of *motive*, *oat* instead of *oath* or *council* instead of *counsel* were counted as incorrect, as these responses differ considerably from the target items in semantic content. Finally, as regards **grammatical mistakes**, they were not taken into consideration. Therefore, sentences such as **The farmer sells the eggs that his hens lays.* were marked as correct.

After marking the test items, scores were given. Laufer and Nation (1999) devised the following procedure: "Each learner was given 6 scores: a score for the number of correct items at each of the 2000, 3000, UWL, 5000, and 10 000 levels and for the total score of correctly retrieved items." (p. 39). The same method was employed in the present study.

4.2 Statistical Analysis

Based on the results presented in Table 7.1, foreign language participants were grouped into 3 proficiency levels for further statistical analysis. The proficient group included 4 participants. The scores in this group were from 80 – 84. The advanced group consisted of 10 participants. Their scores were between 55 and 67. The intermediate group was comprised of 9 participants whose scores ranged from 35 – 51. The group of native English speakers did not take the test, as it was deemed to be too easy for them.

Participant	2.000	3.000	5.000	UWL	10.000	Total	Group
1	18	18	17	18	13	84	2
2	18	16	16	17	14	81	2
3	18	17	15	17	13	80	2
4	17	15	16	18	14	80	2
5	17	16	13	14	7	67	3
6	18	16	7	17	8	66	3
7	18	14	10	15	9	66	3
8	18	14	14	15	5	66	3
9	18	12	10	16	6	62	3
10	16	14	13	12	7	62	3
11	18	14	10	13	5	60	3
12	18	14	7	13	8	60	3
13	18	14	7	12	8	59	3
14	17	12	7	10	9	55	3
15	17	9	7	11	7	51	4
16	17	11	5	11	5	49	4
17	17	9	8	12	3	49	4
18	15	11	6	8	4	44	4
19	14	6	6	9	4	39	4
20	11	7	8	8	4	38	4
21	11	9	6	8	2	36	4
22	14	7	3	8	3	35	4
23	14	8	6	6	1	35	4

Table 7.1: Absolute Scores on the Vocabulary Size Test by Participant

A one-way repeated measures ANOVA was performed. The between-group variable was the proficiency group (proficient, advanced, or intermediate). The repeated-measures variable was the frequency level (with five levels because there were five frequency bands in the test). The independent variable was the score obtained by each participant. Significance was set at $p < 0.05$.

Mauchly's test indicated that the assumption of sphericity had been met, $\chi^2(9) = 11.63$, $p = 0.236$. Results show a highly significant main effect of group, $F(2, 20) = 96.06$, $p = 0.000$. Pairwise comparisons showed that all groups differed significantly ($p = 0.000$) from each other. This indicates that the four proficiency groups showed a significantly different performance when looking at all frequency levels together. Moreover, the results show a highly significant main effect of frequency level, $F(4, 80) = 77.81$, $p = 0.000$. Pairwise comparisons revealed that the significant main effect of frequency level reflects significant

differences (all $p \leq 0.001$) between all levels, except for levels 3.000 vs. UWL ($p = 0.404$) which show similar mean scores ($M = 13.01$, $SE = 0.34$ vs. $M = 13.40$, $SE = 0.42$). The significant main effect of frequency shows that throughout the test, frequency bands increased in their degree of difficulty, except for the UWL, which showed a similar degree of difficulty to level 3.000, and which was easier than the higher word frequency level 5.000. Finally, the interaction frequency level x group was also highly significant, $F(8, 80) = 5.25$, $p = 0.000$. Within-subjects contrasts revealed that frequency levels 2.000 vs. 3.000 had a significant interaction with group ($p = 0.001$), levels 3.000 vs. 5.000 only showed a trend ($p = 0.051$), and levels 5.000 vs. UWL, and UWL vs. 10.000 showed no significant interaction with group. Looking at Figure 7.1, the significant group x frequency band interaction for level 2.000 vs. 3.000 indicates that the proficient group showed a significantly smaller decrease in scores between levels 2.000 and 3.000. Similarly, the trend noticed between levels 3.000 vs. 5.000 indicates the smaller decrease of scores in the proficient group. However, groups show the same pattern of increase between levels 5.000 and UWL, and the same pattern of decrease between levels UWL and 10.000.

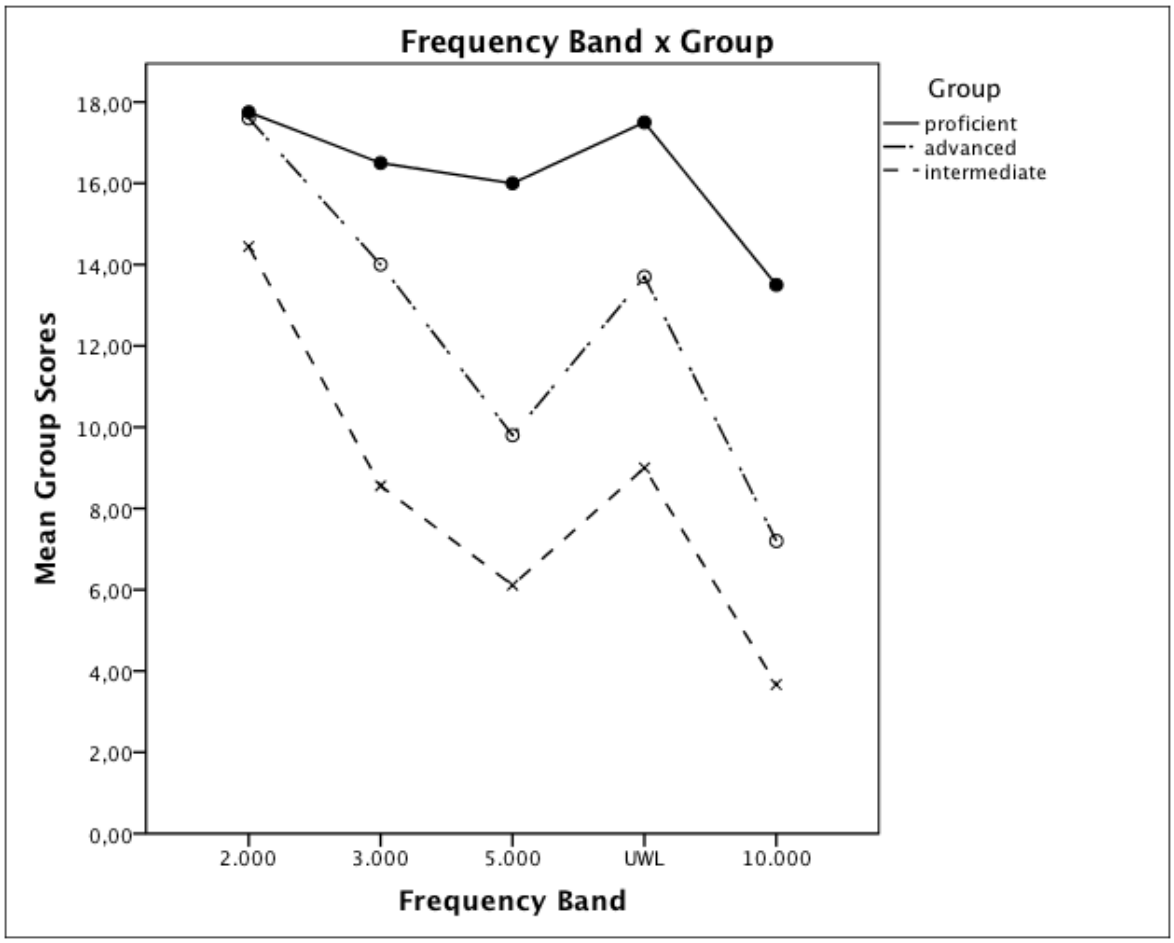


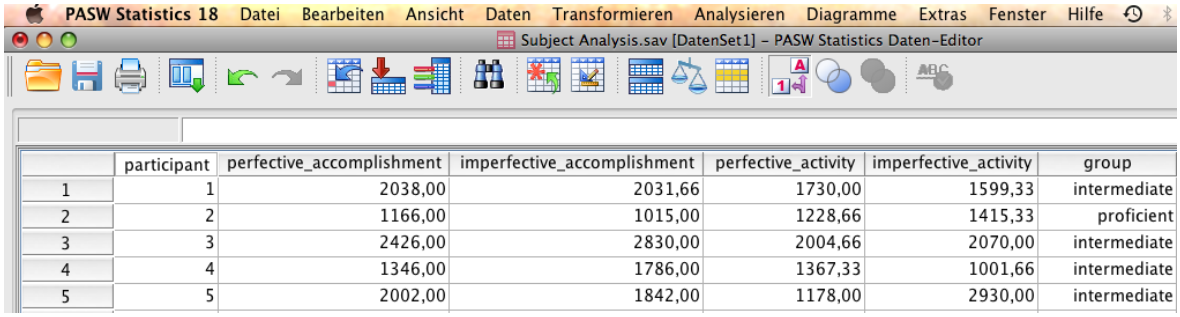
Figure 7.1: Mean Group Scores per Frequency Band

5 Results: Priming Study

5.1 Coding

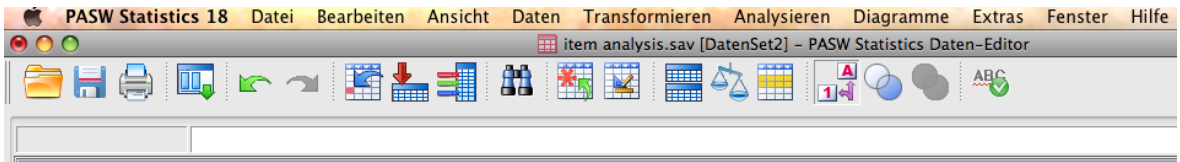
Data had to be coded for a reaction time analysis and an analysis of reaction accuracy. The reaction time analysis is an analysis of how fast or slow participants responded to test stimuli. As is common practice in psycholinguistic research, only correct reactions were included in the analysis. The analysis of reaction accuracy is an analysis of the number of correct or incorrect responses that was given.

Following Magliano and Schleich, data in the reaction time analysis as well as the reaction accuracy analysis were coded for: a subject analysis and an item analysis. “In the subject analysis, data within each cell are collapsed over items using the mean …; in the item analysis, data are collapsed over subjects” (McNamara 2005: 55). Thus, in the subject analysis mean reaction times were entered per participant (see Figure 7.2), whereas in the item analysis mean group reaction times were entered per target (see Figure 7.3).



	participant	perfective_accomplishment	imperfective_accomplishment	perfective_activity	imperfective_activity	group
1	1	2038,00	2031,66	1730,00	1599,33	intermediate
2	2	1166,00	1015,00	1228,66	1415,33	proficient
3	3	2426,00	2830,00	2004,66	2070,00	intermediate
4	4	1346,00	1786,00	1367,33	1001,66	intermediate
5	5	2002,00	1842,00	1178,00	2930,00	intermediate

Figure 7.2: Data Coding for the Subject Analysis in PASW Statistics



	target	perfective_gr1	imperfective_gr1	perfective_gr2	imperfective_gr2	perfective_gr3	imperfective_gr3	perfective_gr4	imperfective_gr4	verb_class
1	cross street	1506,00	1402,00	826,00	1170,00	1140,66	1410,25	2103,33	2254,80	accomplishment
2	cook meal	1122,00	1351,33	1407,33	858,00	1045,00	848,40	1276,00	2085,00	accomplishment
3	change fl…	1367,33	1158,00	714,00	1055,33	878,57	1562,00	2078,00	2098,00	accomplishment
4	wash dress	1474,00	1670,00	1031,33	642,00	1263,00	942,80	2542,80	2156,66	accomplishment
5	climb tree	1598,00	919,33	911,33	730,00	1050,00	799,71	1662,00	1351,33	accomplishment

Figure 7.3: Data Coding for the Item Analysis in PASW Statistics

In the subject analysis, participants were coded for their group and mean reaction times to each interaction (perfective x accomplishment, progressive x accomplishment, perfective x activity, and progressive x activity). In the item analysis, test items were coded for verb

class (accomplishment vs. activity) and mean reaction times per group. In a first run, no outliers were excluded. Only in a second run, data were discarded (see Chapter 6.2.2.3).

5.2 Statistical Analysis

Data analysis was carried out using Predictive Analytics SoftWare (PASW) Statistics 18.0 for Mac OS 10.5, Release Version 18.0.0. A p-value less than 0.05 was considered significant for all tests reported.

5.2.1 Reaction Time

5.2.1.1 Subject Analysis

For the subject analysis a mixed ANOVA (Analysis of Variance) was carried out. The between-group variable was the proficiency level as measured by the vocabulary size test. It included four levels, namely native, proficient, advanced and intermediate. The repeated-measures variables were grammatical aspect (perfective vs. progressive) and lexical aspect (accomplishment targets vs. activity targets).

There was a highly significant main effect of proficiency level on reaction times, $F(3, 24) = 5.97$, $p = 0.003$. As can be seen in Figure 7.4, the proficient group showed the fastest reaction times, followed by the advanced group, native speakers and the intermediate group. Pairwise comparisons revealed that the significant main effect of group reflects significant differences in reaction times between the intermediate group vs. native speakers ($p = 0.042$), the proficient group ($p = 0.005$) and the advanced group ($p = 0.001$). The other between group comparisons were non-significant.

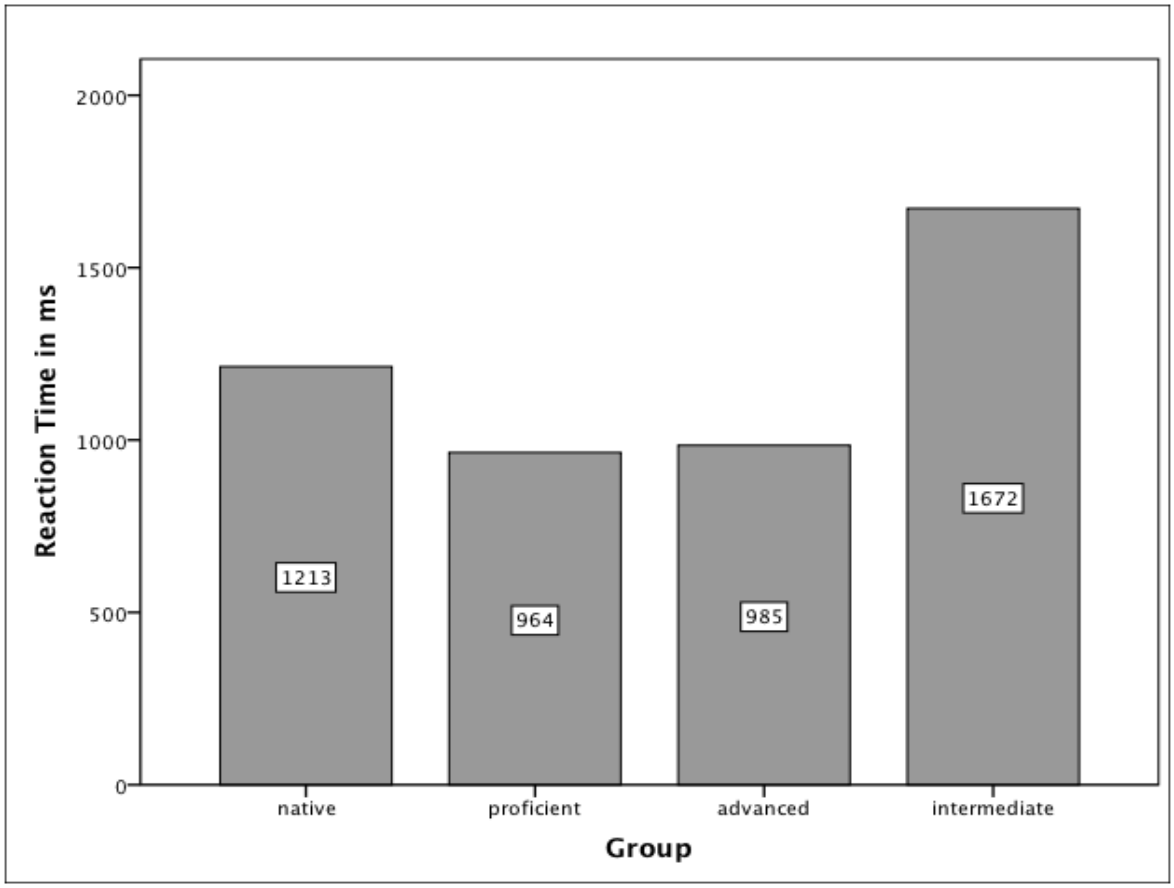


Figure 7.4: Mean Reaction Time per Group in the Subject Analysis

There was no significant effect of grammatical aspect, F(1, 24) = 0.03, p = 0.855. This indicates that when looking at all participants together, mean reaction times to perfective and progressive primes were in general equally fast. However, when looking at Figure 7.5 it can be seen that the native control group showed a slightly higher mean difference between perfective and imperfective events, than the L2 groups.

There was a significant main effect of lexical aspect on mean reaction times, F (1, 24) = 11.69, p = 0.002. Participants took longer to respond to accomplishment stimuli (M = 1315.66, SE = 84.02) than to activity stimuli (M = 1100.75, SE = 84.21).

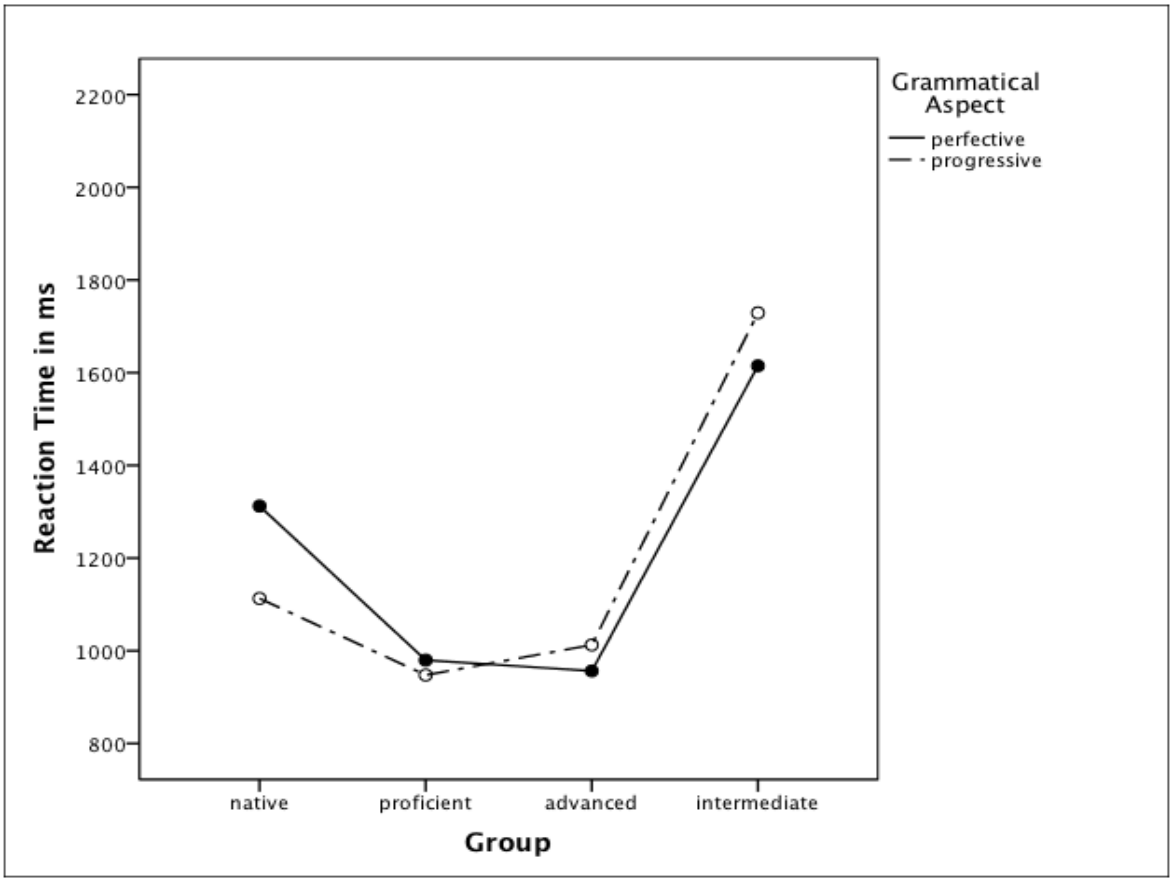


Figure 7.5: Mean Reaction Time per Group to Perfective and Progressive Targets in the Subject Analysis

There was no significant interaction between proficiency level and grammatical aspect, $F(3, 24) = 0.69$, $p = 0.565$. Figure 7.5 above illustrates mean reaction times to perfective vs. progressive targets by group. The figure suggests a between group difference with native speakers and the proficient group showing shorter reaction times to progressive targets, whereas the advanced and intermediate groups show a longer reaction time to progressive targets. However, as can be seen in Table 7.2 the standard error was high for all interactions. This resulted in a non-significant effect.

Group	Grammatical Aspect	Mean	Standard Error
native	perfective	1312.39	201.91
	progressive	11112.86	186.42
proficient	perfective	979.83	225.74
	progressive	947.62	208.43
advanced	perfective	956.40	142.77
	progressive	1012.64	131.82
intermediate	perfective	1614.81	150.49
	progressive	1729.10	138.95

Table 7.2: Mean Reaction Time and Standard Error to Perfective and Progressive Targets

per Group

Figure 7.6 contains the mean reaction times to accomplishment primes and activity primes divided by group. There was no significant interaction between proficiency level and lexical aspect, implying that all groups responded faster to activity than accomplishment primes, F(3, 24) = 2.16, p = 0.118.

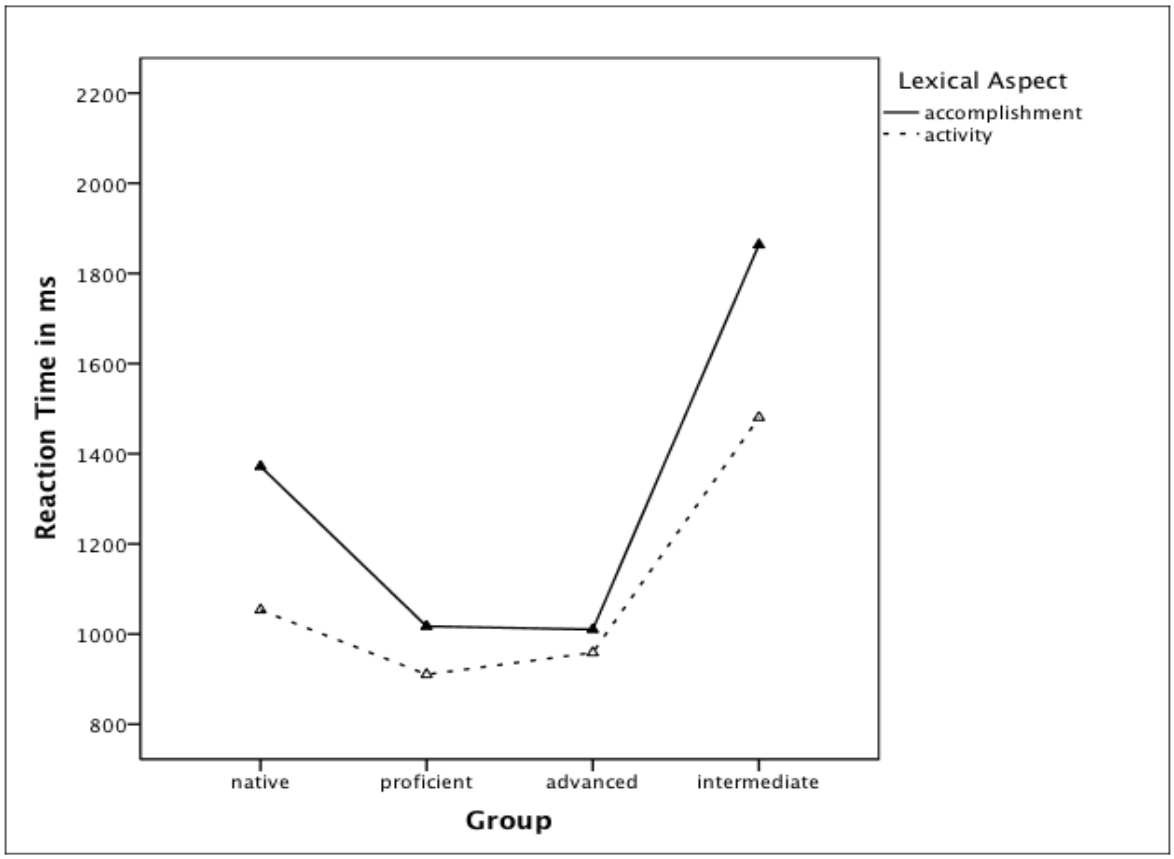


Figure 7.6: Mean Reaction Time per Group to Accomplishment and Activity Targets in the Subject Analysis

Also, there was no significant interaction effect between grammatical x lexical aspect, F(1, 24) = 0.864, indicating that when looking at all participants together, there was no effect on whether accomplishment primes were presented in the perfective or progressive form, nor whether activity primes were presented in the perfective of progressive form.

Finally, there was no significant interaction between proficiency level x grammatical aspect x lexical aspect, F(3,24) = 0.134, p = 0.939. However, a profile could be noted, which remained constant throughout verb classes. As can be seen in Figure 7.7, for accomplishment verbs mean reaction times to perfective stimuli were slower than to progressive stimuli in native speakers (M = 1484.66, SE = 226.20 vs. M = 1259.33, SE = 221.32) and the proficient group (M = 1045.66, SE = 252.90 vs. M = 988.58, SE =

247.45). However, perfective stimuli elicited a faster reaction time in the advanced (M = 1002.64, SE = 159.95 vs. M = 1017.76, SE = 156.50) and intermediate group (M = 1782.74, SE = 168.60 vs. M = 1943.96, SE = 164.96).

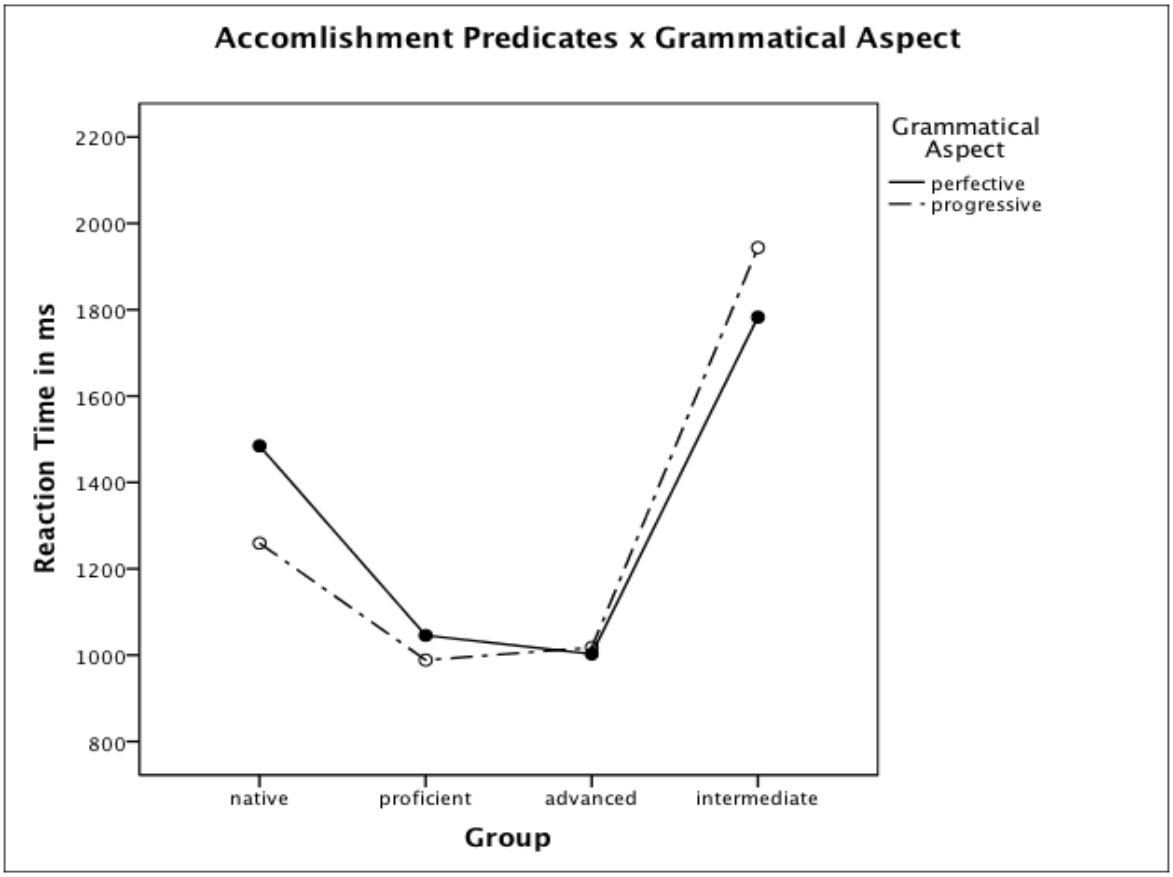


Figure 7.7: Mean Reaction Time per Group to Perfective and Progressive Accomplishment Targets in the Subject Analysis

Likewise, as illustrated in Figure 7.8, for activity targets mean reaction times to perfective stimuli were slower than to progressive ones in native speakers (M = 1140.13, SE = 197.56 vs. M = 966.39, SE = 226.61) and the proficient group (M = 913.99, SE = 220.87 vs. M = 906.66, SE = 253.36), whereas they showed a faster decision latency in the advanced (M = 910.16, SE = 139.69 vs. M = 1007.53, SE = 160.24) and intermediate group (M = 1446.88, SE = 147.25 vs. M = 1514.25, SE = 168.90).

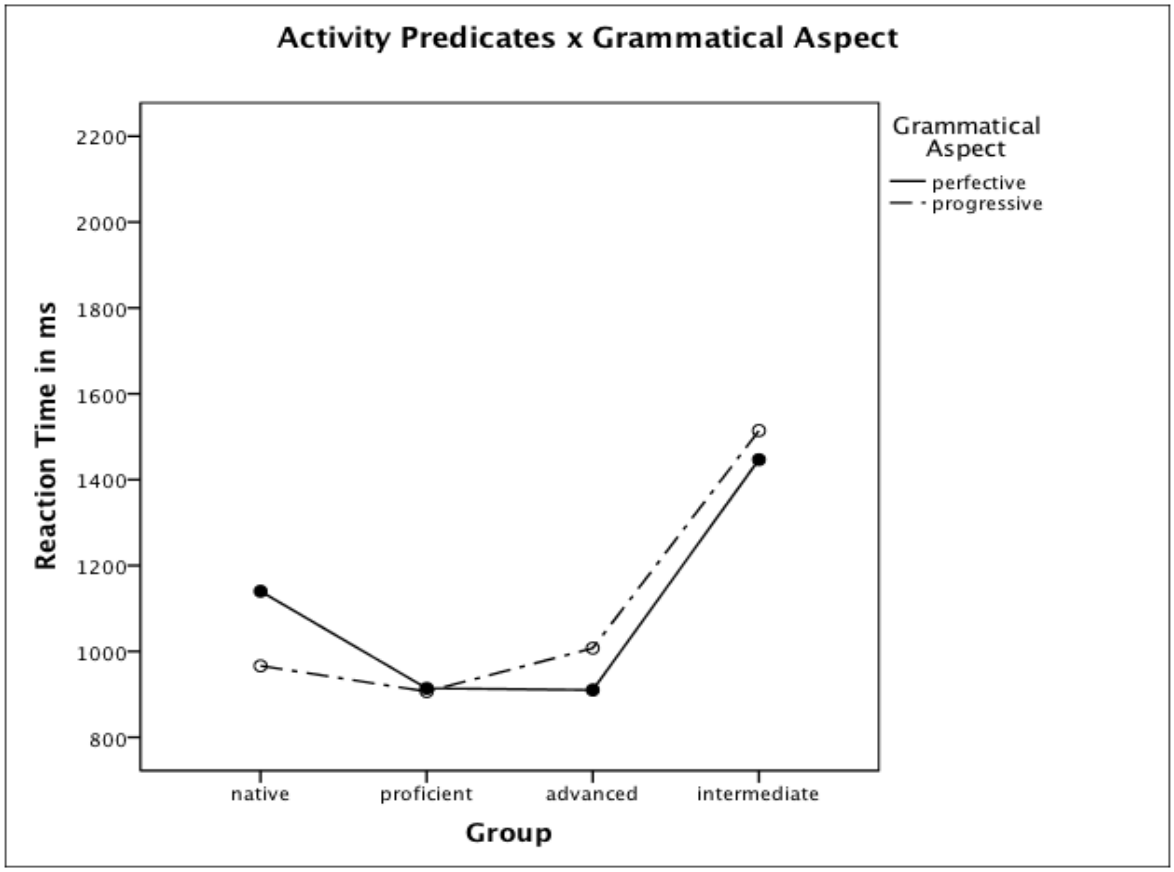


Figure 7.8: Mean Reaction Times per Group to Perfective and Progressive Activity Targets in the Subject Analysis

5.2.1.2 Item Analysis

Again, a mixed ANOVA was performed. The between-group variable was the verb class (accomplishment vs. activity verbs). The repeated-measures variables were grammatical aspect (perfective vs. progressive) and group (native, proficient, advanced and intermediate).

For the main effect of group, Mauchly's Test of Sphericity showed that the assumption of sphericity had been violated, $\chi^2(5) = 11.12$, $p = 0.05$. Therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = 0.63$). Results show a highly significant main effect group, $F(1.89, 18.97) = 32.40$, $p = 0.000$. As illustrated in Figure 7.9, the proficient group showed the fastest reaction times, followed by the advanced group, native speakers and the intermediate group. Pairwise comparisons revealed that all groups differed significantly from each other (all $p < 0.05$).

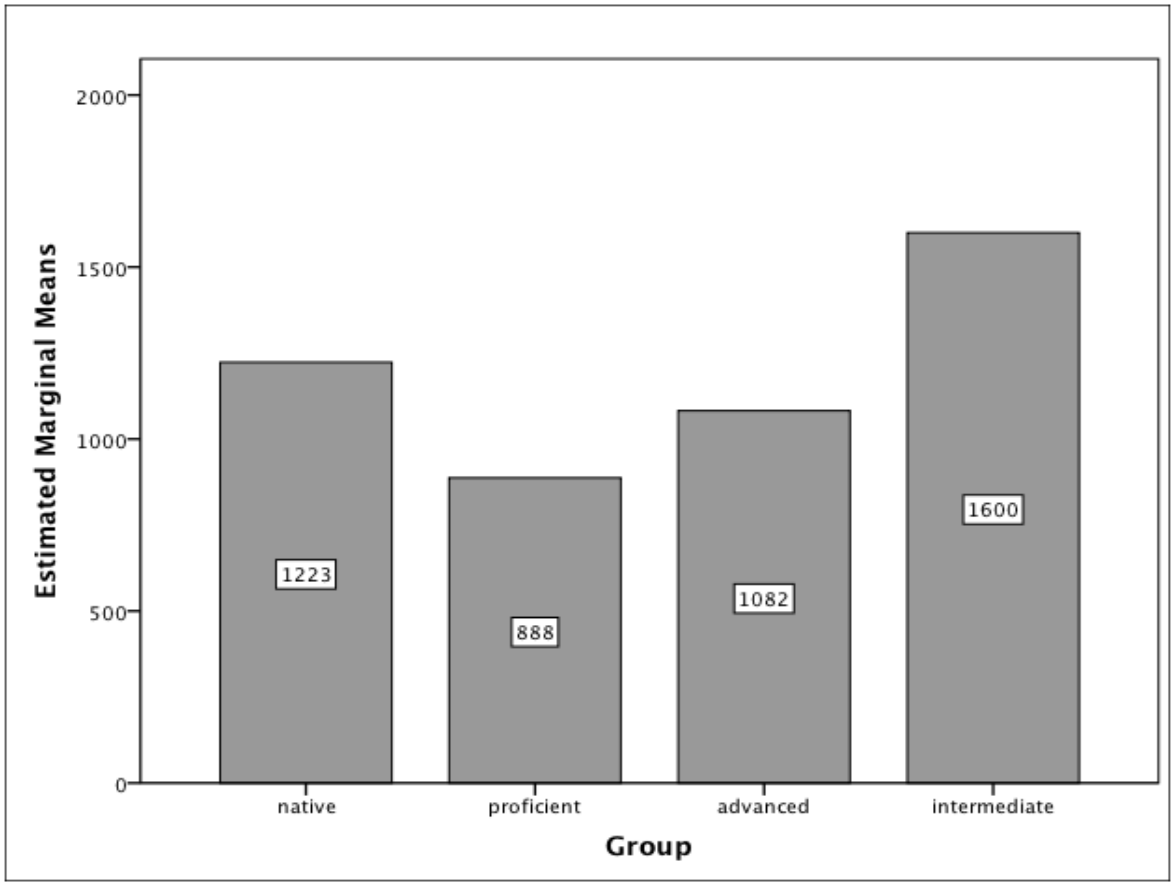


Figure 7.9: Mean Reaction Time per Group in the Item Analysis

There was no significant main effect of grammatical aspect, F(1, 10) = 0.10, p = 0.756. This indicates that when looking at items, reaction times to both verb classes were not affected as to whether they were presented in the perfective or progressive aspect.

However, as has already been noted for the subject analysis, a significant main effect of lexical aspect was discovered, F(1, 10) = 6.96, p = 0.025. This suggests that across subjects reaction times to activity targets were faster (M = 1101.72, SE = 51.66) than to accomplishment targets (M = 1294.60, SE = 51.66).

There was no significant interaction effect of proficiency group x grammatical aspect, F(1.53, 15.38) = 0.52, p = 0.553. Thus, there were no significant between group differences in reaction times to perfective vs. progressive targets.

However, a trend was noted in the interaction proficiency group x lexical aspect, F(3, 30) = 2.88, p = 0.052. Looking at Figure 7.10, this suggests that mean reaction time differences (MD) between accomplishment and activity targets were smaller in the proficient group (MD = 48.861) and the advanced group (MD = 32.312), than in native speakers (MD = 301.834) and the intermediate group (MD = 388.52).

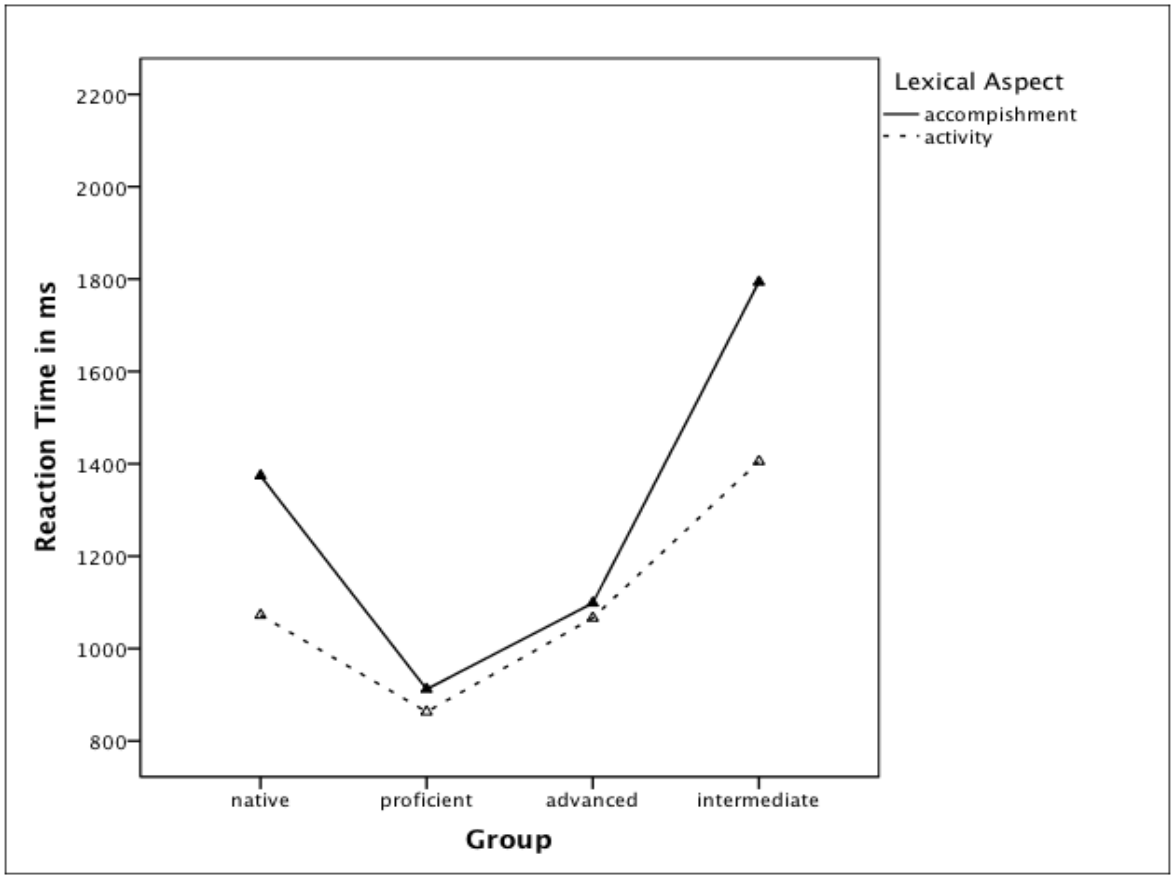


Figure 7.10: Mean Reaction Time per Group for Accomplishment and Activity Targets in the Item Analysis

The interaction effect between grammatical aspect x lexical aspect was not significant, $F(1, 10) = 0.13$, $p = 0.912$. This indicates that across participants decision latencies for both accomplishment targets and activity targets were not significantly affected by whether they had been presented in the perfective or progressive aspect.

Finally, the interaction proficiency group x grammatical aspect x lexical aspect was not significant, $F(3, 30) = 0.32$, $p = 0.807$. This shows that the non-significant grammatical aspect x lexical aspect interaction described above was not different between groups.

5.2.2 Accuracy

5.2.2.1 Subject Analysis

A mixed ANOVA was carried out. The between-group variable was the proficiency group with four levels. The repeated-measures variables were grammatical aspect (perfective aspect vs. progressive aspect) and lexical aspect (accomplishment verbs vs. activity verbs).

Figure 7.11 shows the between-group results. Similar to the reaction time analysis, there was a statistical trend for the main effect of group, $F(3, 24) = 2.84$, $p = 0.059$. Pairwise comparisons revealed that the intermediate group produced significantly less correct responses than native speakers ($p = 0.029$), and the proficient group ($p = 0.023$). The remaining between group comparisons were not significant.

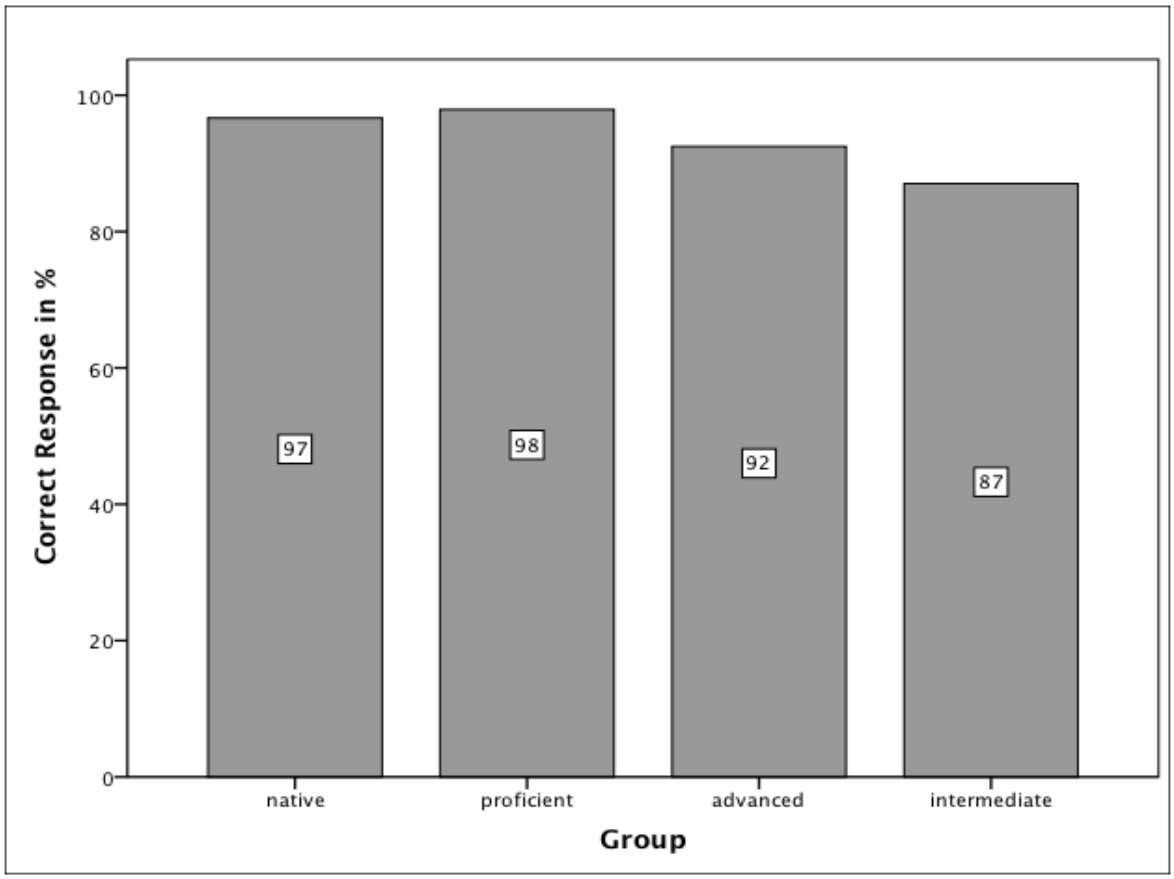


Figure 7.11: Correct Responses in % per Group in the Subject Analysis

There was no significant main effect of grammatical aspect, indicating that the amount of correct responses to perfective vs. progressive targets was equally distributed across participants, $F(1, 24) = 0.39$, $p = 0.535$.

Likewise, there was no significant main effect of lexical aspect, $F(1, 24) = 1.06$, $p = 0.313$. This suggests that participants responded with equal accuracy to accomplishment and activity verbs.

The proficiency group x grammatical aspect interaction was not significant, $F(3, 24) = 0.40$, $p = 0.753$. Taking into account the non-significant main effect of grammatical aspect, this shows that grammatical aspect did not influence accuracy rates for any group.

Similarly, the interaction effect between proficiency group x lexical aspect was not significant, $F(3, 24) = 0.60$, $p = 0.616$. This indicates that the above mentioned non-significant main effect of lexical aspect was present in all groups.

The interaction effect between grammatical x lexical aspect was again not significant, $F(3, 24) = 0.80$, $p = 0.378$. This suggests that across participants, accuracy rates for perfective accomplishment targets vs. progressive accomplishment targets and perfective activity targets vs. progressive activity targets were equally in/correct.

Finally, the group x grammatical aspect x lexical aspect interaction was not significant, $F(3, 24) = 0.78$, $p = 0.514$. This again shows that the non-significant grammatical aspect x lexical aspect interaction described previously was not different between groups.

5.2.2.2 Item Analysis

Also for the item analysis a mixed ANOVA was carried out. The between-group variable was the verb class (accomplishment vs. activity verbs). The repeated-measures variables were grammatical aspect (perfective vs. progressive) and group (native, proficient, advanced and intermediate).

For the main effect of group, Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2(5) = 11.74$, $p = 0.040$. Therefore, degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = 0.636$). Unlike in the subject analysis, there was no main effect of proficiency group, $F(1.90, 19.09) = 2.34$, $p = 0.124$. This suggests that all groups performed equally well.

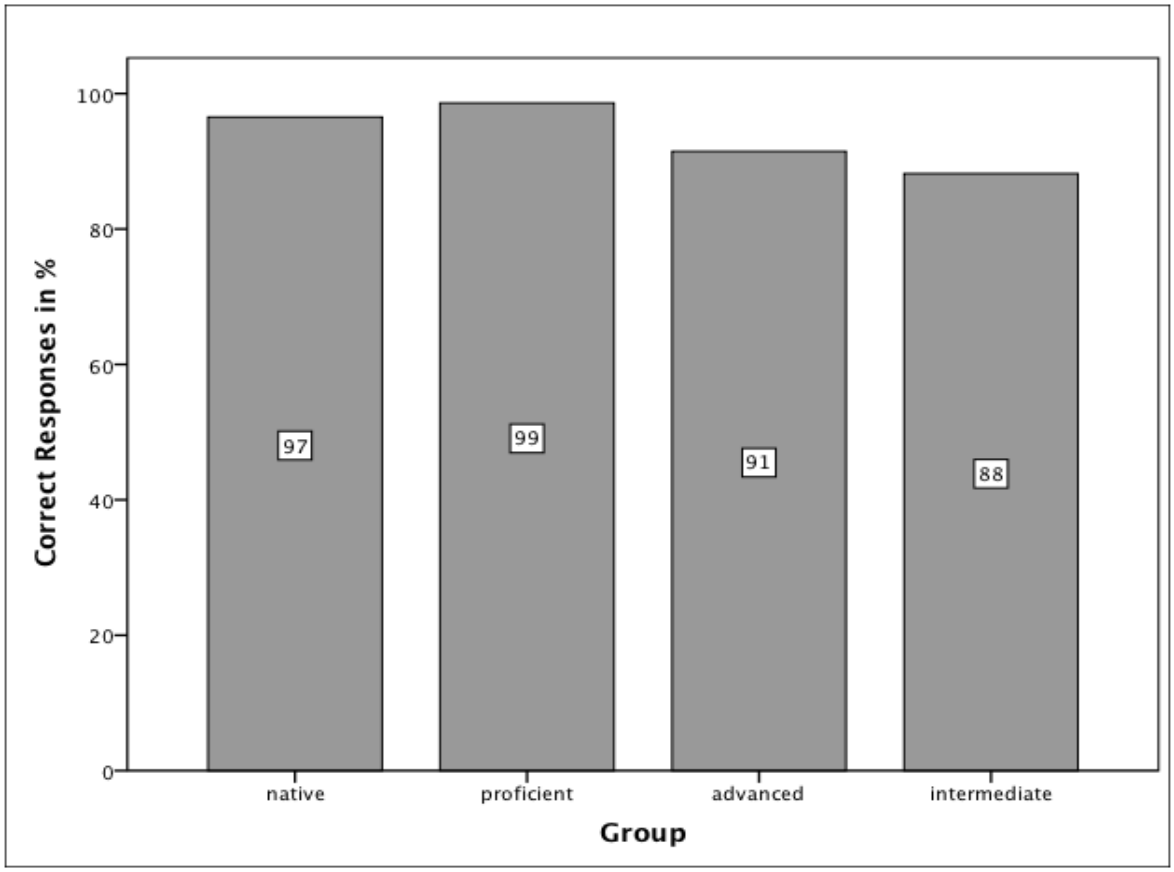


Figure 7.12: Correct Responses in % per Group in the Item Analysis

As previously reported in the subject analysis, there was no significant main effect of grammatical aspect, F(1, 10) = 0.00, p = 0.928. This suggests that when looking at targets, no difference in accuracy rates was observed between perfective and progressive targets.

Similarly, there was no significant main effect of lexical aspect, F(1, 10) = 0.46, p = 0.510. This indicates that participants' responses were equally correct for accomplishment and activity targets.

Moreover, the interaction between grammatical aspect x lexical aspect was not significant, F(1, 10) = 2.31, p = 0.159. This shows that the accuracy of responses was equally high for accomplishment targets when either presented as perfective or progressive primes, or for activity targets when presented as perfective or progressive primes.

Finally, the interaction effect between proficiency group x grammatical aspect x lexical aspect was not significant, F(3, 30) = 0.41, p = 0.741. This indicates that the non-significant interaction described above was true for all groups.

5.2.3 Removal of Outlying Data

As has been illustrated in Table 7.2 for reaction times to perfective vs. progressive targets in the subject analysis, reaction times within groups showed a wide range. This resulted in the overlap of reaction times within groups and led to the non-significant effects reported above. In an effort to homogenise groups, data were removed in two attempts. First, as is common practice in psycholinguistic research, reaction time data above 3000 ms were removed. This removal, however, did not contribute any significant results. Therefore, data are not reported here. Second, it is common to further exclude reaction times which are higher than one, one-and-a-half or two standard deviations from a participant's mean for a particular condition. In the present study a removal of reaction times above two standard deviations was chosen. This removal, however, could only be done for the mean of Experiments 1 and 2 taken together. This is because deletion of data for each of the experimental conditions (perfective x accomplishment, progressive x accomplishment, perfective x activity, progressive x activity) would have resulted in the complete deletion of data for one condition in two participants. However, this removal, too, did not add any significances and results are not reported.

6 Discussion

The goal of the present study was to investigate EFL on-line foregrounding/ backgrounding of aspectual information during narrative comprehension. Participants were learners of an L1 which does not mark grammatical aspect overtly: Austrian German. They were divided into proficiency groups (as measured by vocabulary size) and consisted of proficient, advanced and intermediate learners. A group of native readers served as a control. A 2 (accomplishment vs. activity) x 2 (perfective vs. progressive aspect) design was used. Participants took part in a priming experiment in which they read short stories. The stories were shown sentence by sentence and reading was self-paced. Three sentences after the prime (e.g. *Sam was climbing the tree*.), the target was presented (e.g. *climb tree*). It depicted the event described in the sentence prime and consisted of the base form verb and the object. Participants had to decide whether the target had previously occurred in the story, or not. Decision latencies and error rates were recorded.

The results showed that (1) reaction times were significantly different for all groups, with proficient L2 readers responding fastest, followed by advanced L2 readers, the native control group and intermediate L2 readers, (2) error rates were generally low and significantly higher in the intermediate group, (3) L1 readers showed a higher trend to

foreground/ background events, while L2 readers showed a lower trend, (4) in the L1 control group and proficient L2 readers, reaction times to progressive vs. perfective targets tended to be faster, whereas in advanced and intermediate L2 readers reaction times to progressive vs. perfective targets tended to be slower, (5) across groups reaction times were significantly faster for activity vs. accomplishment targets, (6) across groups there was no significant interaction between grammatical and lexical aspect.

In the following discussion, these results will be examined in light of the research questions and hypotheses that were used to predict EFL foregrounding/ backgrounding. That is, results will be interpreted with regard to the general foregrounding/ backgrounding process, the influence of grammatical aspect therein, the role of lexical aspect, and the interaction between grammatical and lexical aspect. Moreover, results will be compared to related work in the field of SLA research and input processing.

6.1 Foregrounding/ Backgrounding

The first question that was addressed in the present study examined whether L2 readers show **foregrounding/ backgrounding** effects during story comprehension. Based on the *Capacity Hypothesis* two predictions were made. The first concerned general error rates and reaction times, both of which allow inference about predicates' activation levels. The second was a more specific prediction for reaction time differences between foregrounded vs. backgrounded events.

Concerning general error rates and reaction times, the *Capacity Hypothesis* was only partially supported. Support for the hypothesis comes from the error analysis. It was predicted that error rates should decrease with language proficiency and, correspondingly, the results demonstrated that L1 readers as well as proficient L2 readers had higher accuracy scores than advanced and intermediate L2 readers. It could, therefore, be concluded that a higher language proficiency increases working memory capacity which in turn allows readers to keep events foregrounded for longer.

No support for the hypothesis, however, comes from the reaction time analysis. It was predicted that reaction times should decrease with language proficiency. But contrary to prediction, proficient L2 readers as well as advanced L2 readers significantly outperformed L1 readers in response times by making faster decisions. This result might be interpreted in two ways; first, it could be argued that the proficient and advanced L2 learners of the present study had a higher working memory capacity than the L1 group. However, this interpretation would go against the assumption that processing a non-native language requires greater working memory resources. Therefore, an alternative

interpretation is more plausible; processing speed is a far more complex phenomenon, involving more factors than merely language proficiency and working memory capacity. For example, general reading skill and increased us of reading strategies might contribute to faster decision latencies.

Importantly, the finding that proficient and advanced L2 readers outperformed L1 readers in decision times has a wider implication; processing speed alone does not account for the quality of situation representations. Although L1 readers were slower than advanced and proficient L2 readers in their reaction times, they evidenced a higher trend to foreground/ background events. The result, therefore, supports Perfetti's (1985, and following articles) *Lexical Quality Hypothesis* in which a distinction is drawn between the knowledge of word forms and meanings vs. decoding speed.

As regards the more specific prediction for reaction time differences between foregrounded vs. backgrounded events, the *Capacity Hypothesis* was, again, only partially supported. It was predicted that with higher language proficiency more cognitive resources become available for the higher-level process of foregrounding/ backgrounding. Thus, L1 readers should show a greater difference between perfective vs. progressive events than L2 readers. And within the group of L2 readers, the proficient group should demonstrate a higher foregrounding/ backgrounding effect than advanced and intermediate L2 readers, who should show a marginal or no effect. This prediction was supported in part.

On the one hand, L2 readers showed a non-significantly lower mean difference between perfective vs. progressive targets than the native control group. This may suggest that L2 readers have less cognitive resources available for the higher level process of foregrounding/ backgrounding and that, as a result, they make less use of grammatical markers to help them foreground vs. background narrative events. This trend is also in accordance with Seegmiller et al.'s (2005) findings for L1 and L2 readers and can also be compared to Magliano and Schleich's (2000) findings for L1 high- and low-span readers. Recall that Seegmiller et al. found an effect of grammatical aspect for L1 readers, but not for L2 readers. Similarly, Magliano and Schleich reported an influence of grammatical aspect for high-span readers but no effect for low-span readers.

On the other hand, however, a within group analysis of L2 readers, contradicts a straight interpretation based on the *Capacity Hypothesis*. As mentioned above, the *Capacity Hypothesis* would predict a higher working memory capacity for proficient vs. less proficient L2 readers. As a consequence proficient L2 readers should demonstrate a higher mean difference in reaction times, comparable to L1 readers. Therefore, it is surprising that proficient L2 readers' decision latencies did not approach L1 performance.

What is more, their mean reaction time difference for activity predicates was even smaller than in the advanced and intermediate groups. However, instead of arguing that proficient L2 readers had too little working memory capacity available for foregrounding/ backgrounding, I would like to claim that this result was obtained because proficient L2 readers were at an in-between stage, moving from L1 influenced processing to more native-like processing (as discussed below). Such a profile, termed *amalgamation* (Hernandez, Bates, & Avila, 1994) has also been found in sentence processing studies.

6.2 Grammatical Aspect

The second question addressed was the way in which L2 readers make use of grammatical aspect to foreground/ background narrative events. Two hypotheses were used to predict the outcome. The first hypothesis claimed that processing is primarily led by the semantic meaning of grammatical markers. It predicted that on-going progressive events should be foregrounded as they are more relevant. The second hypothesis, however, asserted that processing is primarily guided by the degree of difficulty that EFL learners experience with an aspect marker. In particular, it predicted that progressive aspect should be more difficult to process because German makes no use of overt aspectual marking and, because progressive aspect is universally acquired later.

Both hypotheses received partial support. The first hypothesis accurately predicted proficient L2 readers' performance: it was found that similar to the L1 control group, they showed a non-significant trend to foreground progressive events and to background perfective events. This suggests that proficient L2 readers can make use of the semantics of grammatical markers when constructing situation models.

The second hypothesis, however, accurately predicted advanced and intermediate L2 readers' performance: it was found that they showed a non-significant trend in foregrounding perfective events, while backgrounding progressive ones. This result might suggest that less proficient L2 readers have processing difficulties with linguistic cues marking progressive aspect, and thus cannot make full use of its meaning while constructing situation models.

6.3 Lexical Aspect

The third question investigated in this study concerned the influence of lexical aspect on foregrounding/ backgrounding. Based on Seegmiller et al.'s (2005) study it was hypothesised that predicate telicity influences foregrounding/ backgrounding in that telic

predicates (accomplishments) increase the activation of events in memory, while atelic predicates (activities) diminish it. However, this hypothesis was not supported in the present study. Across groups, activity predicates showed a significantly shorter reaction time than accomplishments. This would suggest that atelic and not telic predicates are foregrounded. However, this conclusion is likely to be wrong. It has to be considered that activity targets were part of Experiment 2 and thus occurred later in the experiment, when participants had already become familiar with the test format. Moreover, the activity verbs used in Experiment 2 had a slightly higher frequency than the accomplishment predicates. This too might have led to an overall faster reaction time. In sum, the significant effect found for lexical aspect may have been due to a weakness in test design and thus no certain conclusion can be drawn.

6.4 Grammatical x Lexical Aspect

The fourth question addressed in this study concerned the possible interaction of grammatical and lexical aspect. Based on the *Aspect Hypothesis* (e.g. Andersen & Shirai, 1994) and findings from input processing studies, it was hypothesised that accomplishment predicates would show a perfective facilitation, whereas activity predicates would show an progressive facilitation. This hypothesis was, however, not supported in the present study. No indication was found for a processing asymmetry. Rather, results tended to show that grammatical aspect was the single contributing factor in foregrounding/ backgrounding.

6.5 Summary

In sum, the following tentative conclusions can be drawn about EFL foregrounding/ backgrounding of aspectual information in story comprehension. The general foregrounding/ backgrounding process in L2 readers is less pronounced than in L1 readers. This might suggests that L2 learners have a strained working memory capacity inhibiting them to a certain degree in the higher-level process of foregrounding/ backgrounding. However, L2 readers' foregrounding/ backgrounding of aspectual information is also qualitatively different from L1 reading. The present study shows that L1 Austrian German EFL readers tend to show L1 influence on processing. This influence decreases with language proficiency. Intermediate and advanced L2 readers have difficulties in processing progressive aspect, because it is not grammaticalised in German. They cannot make use of its semantic meaning and, therefore, cannot foreground progressive events accordingly. Proficient L2 readers are better able to process

progressive aspect. However, they are still not able to make full use of its meaning and, therefore, do not demonstrate a reliable foregrounding effect. Furthermore, the present study indicates that grammatical and lexical aspect do not interact significantly in foregrounding/ backgrounding. Rather, grammatical aspect seems to be a more important factor. Definite conclusions, however, await further empirical studies.

7 Limitations and Suggestions for Future Research

Several factors limit generalizations in the present study. First, a low number of L2 and L1 readers participated in the study; twenty-three L2 and five L1 readers were included. The L2 readers were, furthermore, split in three proficiency levels, with the result that each group had between seven and eight members. A generalization of the results thus becomes difficult. However, by including different L2 proficiency levels, the present study was able to show the influence of proficiency on foregrounding/ backgrounding of aspectual information.

Second, the test design is an issue. Due to the limited number of participants, no counterbalanced design could be used and subsequently the presentation of stimuli was fixed. As mentioned above, this likely became a confounding variable in the results for lexical aspect. For future studies it will be beneficial to randomize the presentation of test stimuli.

Another factor limiting generalization about foregrounding/ backgrounding of aspectual information is the limited scope. In the present thesis, only regular, past tense accomplishment and transitive activity predicates were included in the test stories. Surely, this limits generalization to naturally occurring story processing. A broader scope in future studies will allow the results to be generalized.

Despite these limitations, several trends were found in the present data and tentative interpretations could be provided to answer the research questions. At the same time, the present research raises more issues for future research, relating to the test method, participants and materials.

Concerning the **test method**, future studies need to examine the validity of the sentence-priming method for L2 reading. At present it is arguable whether the results gained in the present study can be directly ascribed to foregrounding/ backgrounding processes. It is conceivable that the results are merely effects of word priming and not story processing.

What is more, future investigators might even need to develop an entirely different test method. First, the present test method is prone to yield non-significant results. As has

already been noted by Harrington (2006), reaction time measure in L2 readers are likely to produce a high within group variability, especially if less proficient readers are involved. As a result, statistical analysis and data interpretation become difficult. Second, the present test format is limited in its use. In the existing design the sentence prime alternates between perfective and progressive aspect and the target includes an object. Therefore, the processing of various types of state predicates and intransitive activity verbs cannot be measured. For example, the mental state verb *know* and the emotional state verb *hate* cannot be used with progressive aspect, and the mental state verb *hope* and the activity verb *swim* cannot take an object.

As regards **participants**, future studies could examine whether L2 foregrounding/ backgrounding processes (within specific proficiency groups) are universally constrained or influenced by the L1. To this end, investigators could compare learners from L1s which either mark grammatical aspect overtly, or not. For example, one could study L2 learners with L1 Spanish, French, Italian, Russian or Turkish, and compare their reading process to learners with L1 German, Hungarian, or Hebrew.

Moreover, future researchers should investigate the component skills involved in foregrounding/ backgrounding, as well as individual differences. Inclusion of additional linguistic measures as well as psychological measures in the test design would throw light on this issue. For example, researchers could include measures of general reading skill in L1 and L2. In doing so, the contribution of general reading skill on L2 foregrounding/ backgrounding could be examined. Moreover, it could be examined whether and when L1 reading skills are transferred to L2 and so the *Linguistic Interdependence Hypothesis* (Alderson, 1984; Bernhardt & Kamil, 1995) could be assessed for L2 reading.

Psychological measures could include processing speed (on the word and sentence level) and memory span (high- vs. low-) in L1 and L2. By including these components, the interaction between quantitative measures and the quality of foregrounding/ backgrounding could be investigated. Moreover, the inclusion of these psychological variables would allow testing whether there is a threshold after which L2 readers become able to free enough cognitive resources to foreground/ background narrative events.

With respect to **test material**, future investigators need to develop new stories which would allow the testing of further issues. First and most importantly, it is necessary to study the influence of narrative structure on foregrounding/ backgrounding. In aspect processing studies so far, the processing of grammatical markers has been viewed within the framework of Gernsbacher's (1990) *Structure Building Framework*. Therein, grammatical aspect acts as a processing signal increasing or decreasing activation of memory nodes. However, a wider discourse-level perspective is missing to date.

Grammatical markers occur in a complex story context. As has been put forward in theoretical accounts of narrative structure (e.g. Reinhart, 1984) and writing research (e.g. Bardovi-Harlig, 1998), there are events which forward the narration. These are typically called foregrounded events. It is likely that readers make us of this narrative structure. Any analysis which ignores narrative structure can only paint a partial picture of story processing.

Second, future studies could examine L2 foregrounding/ backgrounding processes involving events depicted by irregular verbs. As has been noted for the present study, L2 readers experience a difficulty in processing irregular as opposed to regular verbs. It would, therefore, be interesting to investigate, whether processing of irregular verbs is only quantitatively different to the processing of regulars, or whether it differs qualitatively.

Third, it would be interesting to investigate the differential influence of grammatical cues (e.g. *-ed*, *-ing*) and lexical cues (e.g. *during, an hour later*) on foregrounding/ backgrounding. As has been repeatedly put forward in writing studies (see for a summary Bardovi-Harlig & Comajoan, 2010), lexical marking of temporal relations precedes morphological marking. Likewise, processing studies (e.g. Clahsen & Felser, 2006) claim that L2 readers make use of lexical cues before morphological ones. Thus, one could investigate if these findings can be extended to foregrounding/ backgrounding of aspectual information in narrative processing.

Fourth, investigations into other situational dimensions, including space, causation, motivation and protagonist, are still needed. First, it has to be determined which dimensions are monitored by L2 readers. Moreover, it has to be determined how foregrounding/ backgrounding proceeds along these dimensions, and how updating processes work.

In sum, the present research opens up a number of research areas for future studies regarding test methods, participants and materials. The importance of further investigations is evident; there is a fundamental need to understand L2 narrative processing. A wider apprehension of the processes and factors involved would allow researchers and teachers to develop methods which help L2 learners allocate their attention to relevant features of the input in a way that enables them to construct meaningful, coherent situation representations.

Bibliography

Aksu-Koç, A., & von Stutterheim, C. (1994). Temporal Relations in Narrative: Simultaneity. In: R. A. Berman & D. I. Slobin (Eds.), *Relating Events in Narrative: A Crosslinguistic Developmental Study* (pp. 393-456). Hillsdale, NY: Lawrence Erlbaum.

Albrecht, J. E., & O'Brien, E. J. (1993). Updating a Mental Model: Maintaining Both Local and Global Coherence. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 19(5), 1061-1070.

Alderson, J. C. (1984). Reading in a Foreign Language: A Reading Problem or a Language Problem?. In J. C. Alderson & A. H. Urquhart (Eds.), *Reading in a Foreign Language* (pp. 1-24). London: Longman.

Andersen, R. (1991). Developmental Sequences: The Emergence of Aspect Marking in Second Language Acquisition. In T. Huebner & C. Ferguson (Eds.), *Crosscurrents in Second Language Acquisition and Linguistic Theories* (pp. 305-324). Amsterdam: John Benjamins.

Andersen, R. (1993). Four Operating Principles and Input Distribution as Explanations for Underdeveloped and Mature Morphological Systems. In K. Hyltenstam & Å. Viberg (Eds.), *Progression & Regression in Language* (pp. 309-339). Cambridge [et al.]: Cambridge University Press.

Anderson, J. (1973). *An Essay Concerning Aspect*. The Hague: Mouton.

Andersen, R., & Shirai, Y. (1994). Discourse Motivations for Some Cognitive Acquisition Principles. *Studies in Second Language Acquisition* 16, 133-156.

Anderson, R. C., & Freebody, P. (1981). Vocabulary Knowledge. In J. T. Guthrie (Ed.), *Comprehension and Teaching: Research Reviews* (pp. 77-117). Newark, DE: International Reading Association.

Anderson, S. E., Matlock, T., Fausey, C., & Spivey, M. J. (2008). On the Path to Understanding the On-line Processing of Grammatical Aspect. In B. C. Love, K. McRae, & V. M. Sloutsky (Eds.), *Proceedings of the 30th Annual Meeting of the Cognitive Science Society* (pp. 2253-2258). Washington, DC: Cognitive Science Society. Available from: http://csjarchive.cogsci.rpi.edu/proceedings/2008/pdfs/p2253.pdf

Andersson, S.-G. (2004). Gibt es Aspekt im Deutschen?. In L. Gautier & D. Haberkorn (Eds.), *Aspekt und Aktionsarten im heutigen Deutsch* (pp. 1-11). Tübigen: Stauffenburg Verlag.

Antinucci, F., & Miller, R. (1976). How Children Talk About What Happened. *Journal of Child Language*, 3, 169-89.

Aziz-Zadeh, L., Wilson, S., Rizzolatti, G., & Iacoboni, M. (2006). Congruent embodied representations for visually presented actions and linguistic phrases describing actions. *Current Biology*, 16, 1818-1823.

Ballweg, J. (2004). Telizität und Atelizität im Deutschen. In L. Gautier & D. Haberkorn (Eds.), *Aspekt und Aktionsart im heutigen Deutsch* (pp. 71-86). Tübingen: Stauffenburg.

Bardovi-Harlig, K. (1994). Anecdote or Evidence? Evaluating Support for Hypotheses Concerning the Development of Tense and Aspect. In E. Tarone, S. M. Gass, & A. D. Cohen (Eds.), *Research Methodology in Second Language Acquisition* (pp. 41-60). Hillsdale, NJ: Erlbaum.

Bardovi-Harlig, K. (1998). Narrative Structure and Lexical Aspect: Conspiring Factors in Second Language Acquisition of Tense–Aspect Morphology. *Studies in Second Language Acquisition*, 20, 471-508.

Bardovi-Harlig, K. (1999). From Morpheme Studies to Temporal Semantics: Tense-Aspect Research in SLA. The State of the Art. *Studies in Second Language Acquisition*, 21(3), 341-382.

Bardovi-Harlig, K. (2000). *Tense and Aspect in Second Language Acquisition: Form, Meaning, and Use*. Oxford: Blackwell.

Bardovi-Harlig, K., & Bergström, A. (1996). The Acquisition of Tense and Aspect in SLA and FLL: A Study of Learner Narratives in English (SL) and French (FL). *Canadian Modern Language Review*, 52, 308-330.

Bardovi-Harlig, K., & Comajoan, L. (2010). Order of Acquisition and Developmental Readiness. In B. Spolsky & F. M. Hult (Eds.), *The Handbook of Educational Linguistics* (pp. 383-397). Malen, Mass. [et al.]: Wiley-Blackwell.

Bardovi-Harlig, K., & Reynolds, D. W. (1995). The Role of Lexical Aspect in the Acquisition of Tense and Aspect. *TESOL Quarterly* 29(1), 107-131.

Barsalou, L. W. (1999). Perceptual Symbol Systems. *Behavioral and Brain Sciences*, 22, 577-660.

Basnight-Brown, D. M., Chen, L., Hua, S., Kostić, A. & Feldman, L. B. (2007). Monolingual and Bilingual Recognition of Regular and Irregular English Verbs: Sensitivity to Form Similarity Varies with First Language Experience. *Journal of Memory and Language*, 57, 65-80.

Behrens, H. (1993). *Temporal Reference in German Child Language: Form and Function of Early Verb* Use. (Doctoral Dissertation), Universiteit van Amsterdam, Amsterdam, The Netherlands.

Bergen, B., & Wheeler, K. (2010). Grammatical Aspect and Mental Simulation. *Brain and Language*, 112(3), 150-158.

Bernhardt, E. B., & Kamil, M. L. (1995). Interpreting Relationships between L1 and L2 Reading – Consolidating the Linguistic Threshold and the Linguistic Interdependence Hypotheses. *Applied Linguistics*, 16, 15-34.

Bertinetto, P. M., Lenci, A., Noccetti, S., & Agonigi, M. (in press). The Indispensable Complexity (When Harder Is Easier). Lexical and Grammatical Expansion in Three Italian L1 Learners. In M. Bertuccelli Papi, A. Bertacca & S. Bruti (Eds.), *Threads in the Complex Fabric of Language, Linguistic and Literary Studies in Honour of Lavinia Merlini Barbaresi.* Pisa: Felici. Available from http://alphalinguistica.sns.it/QLL/QLL07_08/Bertinetto_Lenci_Noccetti_Agonigi.PDF

Bertinetto, P. M., & Noccetti, S. (2006). Prolegomena to ATAM Acquisition. Theoretical Premises and Corpus Labelling. *Quaderni del Laboratoria di Linguistica,* 6, 1-33. Available from http://alphalinguistica.sns.it/QLL/QLL06/Bertinetto_Noccetti.PDF

Bickerton, D. (1981). *Roots of Language.* Ann Arbor: Karoma Publishers.

Bloom, L., Lifter, K., & Hafitz, J. (1980). Semantics of Verbs and Development of Verb Inflection in Child Language. *Language*, 56, 386-412.

Boatwright, C. (1999). *On-Line Processing of Time Reference: Meaning Before Morphology*. Paper presented at the Second Language Research Forum, Minneapolis, MN.

Boogaart, R. (2004). Aspect and Aktionsart. In G. E. Booij (Ed.), *Morphologie: Ein internationales Handbuch zur Flexion und Wortbildung* (Vol. 17(2), pp. 1165-1180). Berlin: Walter de Gruyter.

Brinton, L. J. (1988), *The Development of English Aspectual Systems.* Cambridge [et al.]: Cambridge University Press.

Bronckart, J.-P., & Sinclair, H. (1973). Time, Tense, and Aspect. *Cognition*, 2, 107-130.

Campion, M. E., & Elley, W. B. (1971). *The Academic Vocabulary List by Mary E. Campion and Warwick B. Elley.* Wellington: New Zealand Council for Educational Research.

Carreiras, M., Carriedo, N., Alonso M. A., & Fernández, A. (1997). The Role of Verb Tense and Verb Aspect in the Foregrounding of Information During Reading. *Memory & Cognition*, 25(4), 438-446.

Chalker, S., & Weiner, E. (Ed.) (1998). *The Oxford Dictionary of English Grammar*. *Oxford Reference Online*. Available from http://www.oxfordreference.com

Chialant, D., & Caramazza, A. (1995). Where is Morphology and How Is It Processed? The Case of Written Word Recognition. In L. B. Feldman (Ed.), *Morphological Aspects of Language Processing* (55-76). Hillsdale, NJ: Lawrence Erlbaum.

Chao, L., Haxby, J., & Martin, A. (1999). Attribute-Based Neural Substrates in Temporal Cortex for Perceiving and Knowing about Objects. *Nature Neuroscience*, 2, 913-919.

Clahsen, H., & Felser, C. (2006). Grammatical Processing in Language Learners. *Applied Psycholinguistics*, 27, 3-24.

Clifton, C., Jr., & Duffy, S. A. (2001). Sentence and Text Comprehension. Roles of Linguistic Structure. *Annual Review of Psychology*, 52, 167-96.

Cohen, J. D., MacWhinney, B., Flatt, M., & Provost, J. (1993). PsyScope: A New Graphic Interactive Environment for Designing Psychology Experiments. *Behavior Research Methods, Instruments & Computers, 25,* 257-271.

Coll-Florit, M., & Gennari, S. P. (2011). Time in Language: Event Duration in Language Comprehension. *Cognitive Psychology*, 62, 41-79.

Corbett, A. T., & Chang, F. R. (1983). Pronoun Disambiguation: Accessing Potential Antecedents. *Memory and Cognition*, 11(3), 283-294.

Comrie, B. (1976). *Aspect.* Cambridge: Cambridge University Press.

Cook, A. E., Guéraud, S., Was, C. A., & O'Brien, E. J. (2007). Foregrounding Effects during Reading, Revisited. *Discourse Processes*, 44(2), 91-111.

Deaton, J. A., & Gernsbacher, M. A. (in press). Causal Conjunctions and Implicit Causality: Cue Mapping in Sentence Comprehension. *Journal of Memory and Language*.

Depraetere, I. (1995). On the Necessity of Distinguishing between (Un)boundedness and (A)telicity. *Linguistics and Philosophy*, 18, 1-19.

Dietrich, R., Klein, W., & Noyau, C. (1995). *The Acquisition of Temporality in a Second Language*. Amsterdam: John Benjamins.

Dosher, B. A., & Corbett, A. T. (1982). Instrument Inferences and Verb Schemata. *Memory and Cognition*, 10(6), 531-539.

Dyer, M. G. (1983). *In-Depth Understanding: A Compute Model of Integrated Processing for Narrative Comprehension*. Cambridge, MA: MIT Press.

Ebert, K. H. (2000). *Progressive Markers in Germanic Languages*. In Ö. Dahl (Ed.), Tense and Aspect in the Languages of Europe (Vol. 20, 605-654). Berlin, New York: Mouton de Gruyter.

Egg, M. (2004). Intergressivprädikate: Stiefkinder der Aspektsemantik?. In L. Gautier & D. Haberkorn (Eds.), *Aspekt und Aktionsart im heutigen Deutsch* (pp. 103-118). Tübingen: Stauffenburg.

Ehrich, V. (1992). *Hier und Jetzt. Studien zur lokalen und temporalen Deixis im Deutschen*. Tübingen: Niemeyer.

Eichinger, L. M. (2004). Funktion und Bedeutung von Verbpartikeln. In L. Gautier & D. Haberkorn (Eds.), *Aspekt und Aktionsart im heutigen Deutsch* (pp. 135-150). Tübingen: Stauffenburg.

Evans, V. (2008). Simulation Semantics and the Linguistics of Time. Commentary on Zwaan. *Language Learning*, 58(Supplement 1), pp. 27-33.

Eysenck, M. W., & Keane, M. T. (2010). *Cognitive Psychology. A Student's Handbook* (6th ed.). Hove and New York: Psychology Press.

Ferretti, T. R., Kutas, M., & McRae, K. (2007). Verb Aspect and the Activation of Event Knowledge. *Journal of Experimental Psychology, Learning, Memory and Cognition*, 33(1), 182-196.

Flämig, W. (1971). Tempus und Temporalität – Modus und Modalität – Aktionsart und Aktionalität. In *Probleme der Sprachwissenschaft. Beiträge zur Linguistik* (pp. 253-263). The Hague and Paris: Mouton.

Freiberger, E. M. (2008). *Aspekt, Aktionsart und Zeitliche Referenz im Erstspracherwerb des Deutschen.* (Unpublished diploma thesis). University of Vienna, Vienna, Austria.

Gaddy, M. L., van den Broek, P., & Sung, Y.-Ch. (2001). Influence of Text Cues on the Allocation of Attention During Reading. In T. Sanders, J. Schilperoord, & W. Spooren (Eds.),*Text Representation: Linguistic and Psycholinguistic Aspects* (pp. 89-110). Amsterdam: John Benjamins.

Gernsbacher, M. A. (1990). *Language Comprehension as Structure Building*. Hillsdale, NJ: Erlbaum.

Gernsbacher, M. A., & Jescheniak, J. D. (1995). Cataphoric Devices in Spoken Discourse. *Cognitive Psychology*, 29(1), 24-58.

Geyer, J. J. (1972). Comprehensive and Partial Models Related to the Reading Process. *Reading Research Quarterly*, 7(4), 541-587.

Goodman, K. S. (1967). Reading: A Psycholinguistic Guessing Game. *Journal of the Reading Specialist*, 6, 126-135.

Gough, P. B. (1972). One Second of Reading. In J. F. Kavanagh & I. G. Mattingly (Eds.), *Language by Ear and by Eye* (pp. 331-358). Cambridge, MA: MIT Press.

Graesser, A. C., Millis, K. K., & Zwaan, R. A. (1997). Discourse Comprehension. *Annual Review of Psychology*, 48, 163-189.

Graesser, A. C., Singer, M., & Trabasso, T. (1994). Constructing Inferences During Narrative Text Comprehension. *Psychological Review*, 101, 371-395.

Guéraud, S., & O'Brien, E. J. (2005). Components of Comprehension: A Convergence Between Memory-Based Processes and Explanation-Based Processes. *Discourse Processes*, 39(2/3), 123-124.

Guha, A. (2006). Where is Causality. In R. Sun (Ed.), Proceedings of the 28th Annual Conference of the Cognitive Science Society (pp. 1412-1416). Vancouver, Canada: Cognitive Science Society. Available from http://csjarchive.cogsci.rpi.edu/proceedings/2006/docs/p1412.pdf

Hacohen, A. (2006). The Psychological Reality of the Telic/Atelic Distinction: Evidence from Adult and Child Hebrew. Proceedings of the 21st Annual Meeting of the Israel Associations for Theoretical Linguistics, Haifa, Israel. Available from http://linguistics.huji.ac.il/IATL/21/Hacohen.pdf

Harley, T. A. (2001). *The Psychology of Language: From Data to Theory* (2nd ed.). Hove & New York: Psychology Press.

Harrington, M. (2006). The Lexical Decision Task as a Measure of L2 Lexical Proficiency. *EUROSLA Yearbook*, 6, 147-168.

Haspelmath, M., Dryer, M. S., Gil, D., & Comrie, B. (Eds.) (2005), *The World Atlas of Language Structures.* Oxford [et al.]: Oxford University Press.

Henriksen, B. (1999). Three Dimensions of Vocabulary Development. *Studies in Second Language Acquisition*, 21, 303-317.

Hernandez, A. E., Bates, E. A., & Avila, L. X. (1994). On-line Sentence Interpretation in Spanish-English Bilinguals: What Does It Mean to Be “In Between”?. *Applied Psycholinguistics*, 15(4), 417-446.

Hopper, P. J. (1979). Aspect and Foregrounding in Discourse. In T. Givón (Ed.), *Syntax and Semantics* (pp. 213-241). New York: Academic Press.

Housen, A. (1993). L2 Acquisition of Verb Morphology: A Case Study. In B. Kettemann & W. Wieden (Eds.), *Current Issues in European Second Language Research* (pp. 195-212), Tübingen: Günter Narr.

Housen, A. (2002). The Development of Tense-Aspect in English as a Second Language and the Variable Influence of Inherent Aspect. In M. R. Salaberry & Y. Shirai (Eds.), *The L2 Acquisition of Tense-Aspect Morphology* (pp. 155-197). Amsterdam: John Benjamins.

Howard, D. (1991). Letter-by-Letter Readers: Evidence for Parallel Processing. In: D-Besner & G. W. Humphreys (Eds.), *Basic Processes in Reading. Visual Word Recognition* (pp. 34-76). Hillsdale, NJ: Lawrence Erlbaum.

Johnson-Laird, P.N. (1983). *Mental Models*. Cambridge, UK: Cambridge University Press.

Just, M. A., & Carpenter, P. A. (1992). A Capacity Hypothesis of Comprehension: Individual Differences in Working Memory. *Psychological Review*, 99, 122-149.

Kintsch, W. (1992). How Readers Construct Situation Models for Stories. The Role of Syntactic Cues and Causal Inferences. In A. F. Healy, S. M. Kosslyn & R. M. Shiffrin (Eds.), *From Learning Processes to Cognitive Processes: Essays in Honor of William K. Estes* (pp. 261-278), Hillsdale, NJ: Erlbaum.

Kintsch, W. (1998). *Comprehension: A Paradigm for Cognition*. New York: Cambridge University Press.

Kintsch, W., & van Dijk, T. A. (1978). Toward a Model of Text Comprehension and Production. *Psychological Review*, 85(5), 363-394.

Kiss, G. R., Armstrong, C., Milroy, R., & Piper, J. (1973). An Associative Thesaurus of English and its Computer Analysis. In A. J. Aitken, R. W. Bailey & N. Hamilton-Smith (Eds.), *The Computer and Literary studies* (pp. 135-165). Edinburgh: Edinburgh University Press. Available from: http://www.eat.rl.ac.uk

Klein, W. (1993). The Acquisition of Temporality. In C. Perdue (Ed.), *Adult Language Acquisition: Crosslinguistic Perspectives* (Vol. 2, pp. 73-118). New York: Cambridge University Press.

Klein, W. (1994). Learning How to Express Temporality in a Second Language. In A. Giacalone Ramat & M. Vedovelii (Eds.), *Italiano: Lingua Seconda/Lingua Straniera* (pp. 227-248). Rome: Bulzoni.

Klein, W. (2000). An analysis of the German Perfect. *Language,* 76, 358-383.

Knoeferle, P., Crocker, M. W., & Pulvermüller, F. (2010). Preface. Sentence Processing and Embodiment. *Brain & Language*, 112, 137-142.

Kucera, H., & Francis, W. N. (1967). *Computational Analysis of Present-Day American English*. Providence: Brown University Press.

Langacker, R. W. (1987). Nouns and Verbs. *Language*, 63(1), 53-94.

Langacker, R. W. (2001). The English Present Tense. *English Language and Linguistics*, 5(2), 251-272.

Lantolf, J. P. (2005). Sociocultural and Second Language Learning Research: An Exegesis. In E. Hinkel (Ed.), *Handbook of Research in Second Language Teaching and Learning.* Mahwah, New Jersey: Lawrence Erlbaum.

Laufer, B., & Nation, P. (1999). A Vocabulary-Size Test of Controlled Productive Ability. *Language Testing*, 16(1), 33-51.

Lee, J. F. (1999). On Levels of Processing and Levels of Comprehension. In J. Gútierrez-Rexach & F. Martínez-Gil (Eds.), *Advances in Hispanic Linguistics* (pp. 42-59). Somerville, MA: Cascadilla Press.

Lee, J. F., Cadierno, T., Glass, W. R., & VanPatten, B. (1997). The Effects of Lexical and Grammatical Cues on Processing Past Temporal References in Second Language Input. *Applied Language Learning*, 8(1), 1-23.

Leech, G., Rayson, P., & Wilson, A. (2001). Word Frequencies in Written and Spoken English: Based on the British National Corpus. London: Longman. Available from http://www.comp.lancs.ac.uk/ucrel/bncfreq/flists.html

Li, P,. & Shirai, Y. (2000). *The Acquisition of Lexical and Grammatical Aspect.* Berlin: Mouton de Gruyter.

Lutz, M. F., & Radvansky, G. A. (1997). The Fate of Completed Goal Information in Narrative Comprehension. *Journal of Memory and Language*, 36, 293-310.

Madden, C. J., & Ferretti T. R. (in press). Verb Aspect and Event Representation. In P. Li & W. Klein (Eds.), *The Expression of Time in Language.* Berlin, New York: Mouton de Gruyter.

Madden, C. J., & Therriault, D. J, (2009). Verb Aspect and Perceptual Simulations. *The Quarterly Journal of Experimental Psychology*, 62(7), 1294-1303.

Madden, C. J., & Zwaan, M. A. (2003). How Does Verb Aspect Constrain Event Representation?. *Memory and Cognition*, 31(5), 663-672.

Magliano, J. P., & Schleich, M. C. (2000). Verb Aspect and Situation Models. *Discourse Processes*, 29(2), 83-1112.

Malaia, E., Wilbur, R. B., & Weber-Fox, C. (2009). ERP Evidence for Telicity Effects on Syntactic Processing in Garden-Path Sentences. *Brain and Language*, 108(3), 145-158.

Matthews, P. H. (Ed.) (2007). *The Concise Oxford Dictionary of Linguistics*. *Oxford Reference Online*. Oxford University Press. Available from http://www.oxfordreference.com.

McCoard, R. (1978). *The English Perfect: Tense Choice and Pragmatic Inferences*. Amsterdam: North-Holland.

McKoon, G., & Ratcliff, R. (1992). Inference During Reading. *Psychological Review*, 99(3), 440-466.

McNamara, T. (2005). *Semantic Priming: Perspectives from Memory and Word Recognition*. New York: Psychology Press.

Meara, P., & Jones, G. (1988). Vocabulary Size as a Placement Indicator. In P. Grimwell (Ed.), *Applied Linguistics in Society* (pp. 80-87). London: CILT.

Millis, K. K., & Just, M. A. (1994). The Influence of Connectives on Sentence Comprehension. *Journal of Memory and Language*, 33, 128-147.

Monotransitive. (1998). In S. Chalker & E. Weiner (Eds.), *The Oxford Dictionary of English Grammar*. *Oxford Reference Online*. Retrieved from http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t28.e874

Montrul, S. & Slabakova, R. (2002). The L2 Acquisition of Morphosyntactic and Semantic Properties of the Aspectual Tenses Preterite and Imperfect. In A.-T. Perez-Leroux & J. Liceras (Eds.), *The Acquisition of Spanish Morphosyntax: The L1-L2 Connection* (pp. 115-152). Dordrecht: Kluwer.

Morrow, D. G. (1985). Prepositions and Verb Aspect in Narrative Understanding. *Journal of Memory and Language*, 24, 390-404.

Morrow, D. G. (1990). Spatial Models, Prepositions and Verb-Aspect Markers. *Discourse Processes*, 13(4), 441-469.

Nation, P. (1990). *Teaching and Learning Vocabulary*. Boston, MA: Heinle and Heinle.

Nicholson, T. (1993). The Case Against Context. In G. B. Thompson, W. E. Tunmer & T. Nicholson (Eds.), *Reading Acquisition Processes* (pp. 51-104). Clevedon, UK [et al.]: Multilingual Matters.

Noyau, C. (2002). Temporal Relations in Learner Varieties. Grammaticalization and Discourse Construction. In R. Salaberry & Y. Shirai (Eds.), *The L2 Acquisition of Tense-Aspect Morphology* (pp. 107-127). Amsterdam & Philadelphia: John Benjamins.

O'Brien, E. J., & Myers, J. L. (1999). Text Comprehension: A View from the Bottom-Up. In S. Goldman, A. C. Gaesser & P. van den Broek (Eds.), *Narrative Comprehension, Causality, and Coherence. Essays in Honor of Tom Trabasso* (pp. 35-54). Mahwah, NJ: Lawrence Erlbaum.

O'Bryan, E.,Folli, R., Harley, H., & Bever, T. (2003). *Evidence for the Early Use of Telicity in Comprehension* [Abstract]. Paper presented at the LSA Linguistic Society's Workshop It's About Time: Theoretical and Experimental Perspectives on Tense, Aspect, Modality and Events, East Lansing, Michigan. Available from http://www.cogsci.msu.edu/workshops/time/abstracts/obryan.pdf

Olsen, M. B., & Weinberg, A. (1999). Innateness and the Acquisition of Grammatical Aspect via Lexical Aspect. In Greenhill, A., Littlefield, H. & Tano, C. (Eds.), *Proceedings of the 23rd Annual Boston University Conference on Language Development* (pp. 529-540)*,* Somerville, MA: Cascadilla Press.

Perfetti, C. A. (1985). *Reading Ability*. New York: Oxford University Press.

Piñango, M. M., Winnick, A., Ullah, R., & Zurif, E. (2006). Time-Course of Semantic Composition: The Case of Aspectual Coercion. *Journal of Psycholinguistic Research*, 35, 233-244.

Piñango, M. M., Zurif, E., & Jackendoff, R. (1999). Real Time Processing Implications of Enriched Composition at the Syntax-Semantics Interface. *Journal of Psycholinguistic Research*, 28, 395-414.

Pinker, S. (1991). Rules of Language. *Science*, 253, 530-535.

Quick, D. (1997). *L1 Influence and Primacy of Aspect in Adult Second Language Acquisition*. (MA thesis). University of Pittsburgh, USA.

Radden, G., & Dirven, R. (2007). *Cognitive English Grammar*. Amsterdam [et al.]: Benjamins.

Radvansky, G. A., & Copeland, D. E. (2001). Working Memory and Situation Model Updating. *Memory and Cognition*, 29(8), 1073-1080.

Rayner, K., & Pollatsek, A. (1989). *The Psychology of Reading.* Hillsdale, New Jersey: Lawrence Erlbaum.

Reinhart, T. (1984). Principles of Gestalt Perception in the Temporal Organization of Narrative Texts. *Linguistics* 22, 779-809.

Rinck, M., & Weber, U. (2003). Who When Where: An Experimental Test of the Event-Indexing Model. *Memory & Cognition*, 31(8), 1284-1292.

Robison, R. E. (1990). The Primacy of Aspect: Aspectual Marking in English Interlanguage. *Studies in Second Language Acquisition*, 12, 315-330.

Robison, R. E. (1995). The Aspect Hypothesis Revisited: A Cross-Sectional Study of Tense and Aspect Marking in Interlanguage. *Applied Linguistics*, 16, 344-370.

Rohde, A. (1996). The Aspect Hypothesis and the Emergence of Tense Distinctions in Naturalistic L2 Acquisition. *Linguistics* 34, 1115-1137.

Sasse, H.-J. (2001). Recent Activity in the Theory of Aspect: Accomplishments, Achievements, or just Non-progressive State?. *Arbeitspapiere Nr. 40* (pp. 1-78)*.* Köln: Institut für Sprachwissenschaft, Universität zu Köln.

Schmietdtová, B. (2004). *At the Same Time... The Expression of Simultaneity in Learner Varieties*. Berlin and New York: Mouton de Gruyter.

Schreuder, R., & Baayen, R. H. (1995). Modelling Morphological Processing. In L. B. Feldman (Ed.), *Morphological Aspects of Language Processing* (pp. 131-154). Hillsdale, NJ: Erlbaum.

Seegmiller, S., Ingraffea, K., & Townsend, D. (2003). *The Role of Telicity in Sentence Comprehension* [Abstract]. Paper presented at the LSA Linguistic Society's Workshop It's About Time: Theoretical and Experimental Perspectives on Tense, Aspect, Modality and Events, East Lansing, USA. Available from http://www.cogsci.msu.edu/workshops/time/abstracts/seegmiller.pdf

Seegmiller, S., Townsend, D., DeCangi, D., & Thomas, D. J. (2004). *Comprehenders Use Event Structure to Develop Discourse-Level Representations* [Abstract]. Paper presented at the 10th Annual Conference on Architectures and Mechanisms for Language Processing, Aix en Provence, France. Available from http://aune.lpl.univ-aix.fr/~AMLaP2004/booklet.pdf

Seegmiller, S., Townsend, D., Call, M., Mancini, S., & Ilia, N. (2005). *Bilingual Processing of English Aspectual Properties* [Power Point Presentation]. Paper presented at the Conference on Bi- and Multilingualism, Bolzano, Italy. Available from http://frontpage.montclair.edu/sentencecomprehension/bolzano05rev.ppt.

Segalowitz, N. (2003). Automaticity and Second Languages. In C. Doughty & M. Long (Eds.), *The Handbook of Second Language Acquisition* (pp. 382-388). Oxford: Blackwell.

Shirai, Y. (1991). *Primacy of Aspect in Language Acquisition: Simplified Input and Prototype*. (Unpublished doctoral dissertation). University of California, Los Angeles.

Shirai, Y., & Andersen, R. W. (1995). The Acquisition of Tense-Aspect Morphology: A Prototype Account. *Language*, 71(4), 743-762.

Singer, M. (1979). Processes of Inference during Sentence Encoding. *Memory & Cognition*, 7, 192-200.

Singer, M., Halldorson, M., Lear, J. C., & Andrusiak, P. (1992). Validation of Causal Bridging Inferences in Discourse Understanding. *Journal of Memory and Language*, 31, 507-524.

Slabakova, R. (2002). Recent Research on the Acquisition of Aspect: An Embarrassment of Riches?, *Second Language Research*, 18(2), 172-188.

Slabakova, R., & Montrul, S. (2002). On Viewpoint Aspect Interpretation and Its L2 Acquisition. In R. Salaberry & Y. Shirai (Eds.), *The L2 Acquisition of Tense-Aspect* Morphology (pp. 364-395). Amsterdam: John Benjamins.

Slobin, D. I. (1985). Crosslinguistic Evidence for the Language-Making Capacity. In D. I. Slobin (Ed.), *The Crosslinguistic Study of Language Acquisition* (Vol. 2, pp. 1157-1257). Hillsdale, NJ: Lawrence Erlbaum.

Soanes, C., & Hawker, S. (Eds.) (2005). *Compact Oxford English Dictionary of Current* English (3rd ed). Oxford: Oxford University Press.

Stanovich, K. E., Cunningham, A. E., & Freeman, D. J. (1984). Relation between Early Reading Acquisition and Word Decoding With and Without Context: A Longitudinal Study of First-Grade Children, *Journal of Educational Psychology*, 76(4), 668-677.

Stolz, J. A., & Feldman, L. B. (1995). The Role of Orthographic and Semantic Transparency of the Base Morpheme in Morphological Processing. In L. B. Feldman (Ed.), *Morphological Aspects of Language Processing* (pp. 109-129). Hillsdale, NJ: Lawrence Erlbaum.

Suh, S. Y., & Trabasso, T. (1993). Inferences during Reading: Converging Evidence from Discourse Analysis, Talk Aloud Protocols, and Recognition Priming. *Journal of Memory and Language*, 32, 279-300.

Tettamanti, M., Buccino, G., Saccuman, M. C., Gallese, V., Danna, M., Scifio, P., … Perani, D. (2005). Listening to Action-Related Sentences Activates Fronto-Parietal Motor Circuits. *Journal of Cognitive Neuroscience*, 17, 273-281.

Thieroff, R. (1992). *Das finite Verb im Deutschen. Tempus – Modus – Distanz*. Tübingen: Narr.

Thorndike, E.L., & Lorge, I. (1944). *The Teacher's Word Book of 30,000 Words*. New York: Teachers College, Columbia University.

Townsend, D. J., Seegmiller, S., Call, M., Musial, J., & Mancini, S. (2005). *Immediate vs. Delayed Interpretation of Aspectual Information* [Abstract]. Paper presented at the 11th Annual Conference on Architectures and Mechanisms for Language Processing, Ghent, Belgium.

Trabasso, T., Suh, S., Payton, P., & Jain, R. (1995). Explanatory Inferences and Other Strategies During Comprehension and Their Effect on Recall. In R. F. Lorch & E. J. O'Brien (Eds.), *Sources of Coherence in Reading* (pp. 219-239). Hillsdale, New Jersey: Lawrence Erlbaum.

Truitt, T. P., & Zwaan, R. A. (1997). *Verb Aspect Affects the Generation of Instrumental Inferences*. Paper presented at the 38th Annual Meeting of the Psychonomic Society, Philadelphia, USA.

Urquhart, A. H., & Weir, C. J. (1998). *Reading in a Second Language: Process, Product, and Practice.* London [et al.]: Longman.

van den Broek, P., Rapp, D. N., & Kendeou, P. (2005). Integrating Memory-Based and Constructionist Processes in Accounts of Reading Comprehension. *Discourse Processes*, 39(2&3), 299-316.

van Dijk, T., & Kintsch, W., (1983). *Strategies of Discourse Comprehension*. San Diego, CA: Academic Press.

van Gelderen, A., Schoonen, R., de Glopper K., Hulstijn, J., Simis, A., Snellings, P., & Stevension, M. (2004). Linguistic Knowledge, Processing Speed, and Metacognitive Knowledge in First- and Second-Language Reading Comprehension: A Componential Analysis. *Journal of Educational Psychology*, 96(1), 19-30.

Vendler, Z. (1957). Verbs and Times. *Philosophical Review*, 66, 143-160.

Wagner, L. (2001). Aspectual Influences on Early Tense Comprehension. *Journal of Child Language*, 28, 661-681.

Wårvik, B. (2004). What is Foregrounded in Narratives? Hypotheses for the Cognitive Basis of Foregrounding. In T. Virtanen (Ed.), *Approaches to Cognition through Text and Discourse* (pp. 99-122). Berlin: Mouton de Gruyter.

Weist, R. M., Wysocka, H., Witkowska-Stadnik, K., Buczkowska, E., & Konieczna, E. (1984). The Defective Tense Hypothesis: On the Emergence of Tense and Aspect in Child Polish. *Journal of Child Language*, 5, 45-62.

West, M. (1953). *A General Service List of English Words*. Longman: London.

Yap, F. H., Chu, P. C. K., Yiu, E. S. M., Wong, S. F., Kwan, S. W. M., Matthews, S., … Shirai, Y. (2009). Aspectual Asymmetries in the Mental Representation of Events: Role of Lexical and Grammatical Aspect. *Memory & Cognition*, 37(5), 587-595.

Yap, F. H., Kwan, S. W. M., Yiu, E. S. M., Chu, P. C. K., Wong, S. F., Matthews, S., & Shirai, Y. (2006). *Aspectual Asymmetries in the Mental Representation of Events: Significance of Lexical Aspect*. In R. Sun (Ed.), Proceedings of the 28th Annual Conference of the Cognitive Science Society (pp. 2410-2415). Vancouver, Canada: Cognitive Science Society. Available from http://csjarchive.cogsci.rpi.edu/proceedings/2006/docs/p2410.pdf

Yule, G. (2002). *The Study of Language*. Cambridge [et al.]: Cambridge University Press.

Zareva, A. (2005). Models of Lexical Knowledge Assessment of Second Language Learners of English at Higher Levels of Language Proficiency. *An International Journal of Educational Technology and Applied Linguistics*, 33(4), 547-562.

Zifonun, G., Hoffmann, L., Strecker, B., & Ballweg, J. (1997). *Grammatik der Deutschen Sprache* (Vol. 3). Berlin and New York: de Gruyter.

Zwaan, R. A. (1996). Processing Narrative Time Shifts. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 22(5), 1196-1207.

Zwaan, R. A. (1999a). Five Dimensions of Situation Model Construction. In S. R. Goldman, A. C. Gaesser & P. Van den Broek (Eds.), *Narrative Comprehension, Causality, and Coherence: Essays in Honor of Tom Trabasso* (pp. 93-110). Mahwah, NJ: Erlbaum.

Zwaan, R. A. (1999b). Situation Models: The Mental Leap into Imagined Worlds. *Current Directions in Psychological Science*, 8(1), 15-18.

Zwaan, R. A. (2008). Time in Language, Situation Models, and Mental Simulations. *Language Learning*, 58 (Supplement 1), 13-26.

Zwaan, R. A., & Brown, C. M. (1996). The Influence of Language Proficiency and Comprehension Skill on Situation-Model Construction. *Discourse Processes*, 21, 289-327.

Zwaan, R. A., Langston, M. C. & Graesser, A. C. (1995). The Construction of Situation Models in Narrative Comprehension: An Event-Indexing Model. *Psychological Science*, 6(5), 292-297.

Zwaan, R. A., & Madden, C. J. (2004). Commentary and Reply. Updating Situation Models. *Journal of Experimental Psychology: Learning Memory and Cognition*, 30(1), 283-288.

Zwaan, R. A., & Radvansky, G. A. (1998). Situation Models in Language Comprehension and Memory. *Psychological Bulletin*, 123(2), 162-185.

Zwaan, R. A., Radvansky, G. A., Hilliard, A. E., & Curiel, J. M., (1998). Multidimensional Situation Models during Reading. *Scientific Studies of Reading*, 2, 199-220.

Zwaan, R. A., Taylor, L. J., & de Boer M. (2010). Motor Resonance as a Function of Narrative Time: Further Tests of the Linguistic Focus Hypothesis. *Brain & Language*, 112, 143-149.

Appendix

A) Instructions

You will read stories. Each story will be presented one sentence at a time. When you have finished reading a sentence, press the enter button. Take as much time as you need for reading a sentence. At the end you should understand the whole story.

Sometimes two words will flash up on the screen. You then have to decide as QUICKLY and as ACCURATELY as possible if the activity described with these words has occurred in the story you are currently reading. Press the green button for 'YES' and the red button for 'NO'.

The first story is a practice story. It's there for you to get used to the format.

If you have any questions, please ask!

If you are ready, press the enter button.

B) Abstract in English

The role of grammatical and lexical aspect in the foregrounding/ backgrounding of events during EFL story comprehension was investigated in this thesis. Participants included an L1 English control group and L1 Austrian German adults of intermediate, advanced and proficient EFL levels as indicated by Laufer and Nation's (1999) Vocabulary Levels Test. Based on a priming method developed in J. P. Magliano and Schleich, M. C. (2000). Verb Aspect and Situation Models. *Discourse Processes*, 29(2), 83-112, participants were presented short stories which contained a critical sentence prime that varied in grammatical aspect (perfective vs. progressive aspect) and lexical aspect (accomplishment vs. activity predicate). Three sentences after the prime (e.g. *Mark packed the bag*.) a probe flashed up (e.g. *pack bag*). Participants had to decide as quickly and as accurately as possible whether the probe had appeared in the story or not. Results yielded no relevant statistical significances because reaction times showed a high within group variance. This is consistent with previous research on L2. However, non-significant trends for grammatical aspect were noted in the subject analysis, which indicate quantitative and qualitative processing differences. First, the L1 English group showed a generally larger foregrounding/ backgrounding effect of grammatical aspect than L2 learners. This might support the claim that working memory resources are strained in L2 and so inhibit, to a certain degree, the higher-level process of foregrounding/ backgrounding. Second, the L1 English group and EFL proficient learners tended to foreground progressive aspect and background perfective aspect, while EFL advanced and intermediate learners tended to foreground perfective aspect and background progressive aspect. This trend remained constant for accomplishment and activity predicates. This might support the assumption that the way grammatical aspect influences foregrounding/ backgrounding is dependent on grammatical aspect marking in L1 (explicit vs. non-explicit) and L2 proficiency. Finally, no indication was found that grammatical and lexical aspect interact in foregrounding/ backgrounding.

C) Abstract in German

In dieser Diplomarbeit wurde der Einfluss von grammatischem und lexikalischem Aspekt auf das mentale in den Vordergrund/ Hintergrund Stellen von narrativen Ereignissen während des Lesens von Kurzgeschichten in Englisch als Fremdsprache untersucht. Die Teilnehmer/innen waren erwachsenen Leser/innen mit österreichischem Deutsch als Erstsprache und Englisch als Zweitsprache. Ausgehend von Laufer and Nation's (1999) *Vocabulary Levels Test* wurden diese in Sprachkompetenzgruppen eingeteilt (mäßig fortgeschritten, fortgeschritten, kompetent). Weiters gab es eine Kontrollgruppe von Teilnehmer/innen mit Englisch als Erstsprache. Basierend auf der Priming-Methode in J. P. Magliano und Schleich, M. C. (2000) wurden den Teilnehmer/innen kurze Geschichten präsentiert. Diese beinhalteten jeweils einen kritischen Satz (z.B. *Mark packed/ was packing the bag*. oder *Mike played/ was playing the drum*.). Dieser variierte in gr. Aspekt (perfektiv vs. progressiv) als auch lex. Aspekt (accomplishment- vs. activity-Prädikat). Drei Sätze nach dem kritischen Satz erschien ein Target (z.B. *pack bag*). Daraufhin mussten die Teilnehmer/innen so schnell und so korrekt wie möglich entscheiden, ob das Target zuvor im Text erschienen war, oder nicht. Die Ergebnisse zeigten keine statistischen Signifikanzen, da es eine große Varianz innerhalb der Gruppen gab. Es konnten jedoch einige Trends festgestellt werden, v.a. beim grammatischen Aspekt in der Subjektanalyse. Diese Trends lassen quantitative sowie qualitative Unterschiede in der Verarbeitung zwischen den Gruppen vermuten. Beispielsweise wurde beobachtet, dass die Kontrollgruppe tendentiell in einem höheren Grad grammatischen Aspekt nutzte um narrative Ereignisse in den Vordergrund/ Hintergrund zu stellen. Diese Beobachtung könnte die Behauptung stützen, dass das Arbeitsgedächtnis in der Fremdsprache mehr belastet ist, und daher das in den Vordergrund Stellen von narrativen Ereignissen bis zu einem gewissen Grad gemindert wird. Weiters konnte beobachtet werden, dass die Kontrollgruppe und kompetente Fremdsprachler tendentiell progressiven Aspekt in den Vordergrund stellten, und perfektiven Aspekt in den Hintergrund, wohingegen fortgeschrittene und mäßig fortgeschrittene Fremdsprachler den genau umgekehrten Trend zeigten. Dieser Trend wurde sowohl bei accomplishment- als auch bei activity-Prädikaten festgestellt. Das könnte die Annahme unterstützen, dass die Art und Weise wie gr. Aspekt das in den Vordergrund/ Hintergrund Stellen beeinflusst, davon abhängig ist, ob gr. Aspekt morphologisch in der Erstsprache ausgedrückt wird, und auch wie groß die Fremdsprachkompetenz ist. Es wurde keine Interaktion zw. gr. und lex. Aspekt beobachtet.

D) Curriculum Vitae

MONIKA SUSANNE BONIECKI

BILDUNGSWEG

ab 10/03	*Diplomstudium Sprachwissenschaft* Universität Wien
ab 10/02	*Lehramtsstudium Anglistik/Germanistik* Universität Wien
09/94 – 06/02	*Schulausbildung* Haydn Gymnasium und Realgymnasium, GRG5 Neusprachlicher Zweig mit Französisch ab der 3. Klasse

AUSLANDSAUFENTHALTE

09/05 – 05/06	*Erasmus Auslandsstudium* University of Edinburgh, Scotland
09/00 – 03/01	*Schüleraustausch* Sir Thomas Rich's Grammar School, Gloucester, UK

MITARBEIT AN FORSCHUNGSPROJEKTEN

2010	*Projektmitarbeit zu sprachl. Kompetenz in Downsyndrom* ÖAW, Wien
2009	*Projektmitarbeit zu sprachl. online Tests für Erwachsene* Institut für Sprachwissenschaft, Wien
2008	*Projektmitarbeit zu sprachl. Kompetenz in Downsyndrom* ÖAW, Wien
2008	*Projektbeitrag zu CLIL an österr. HTLs* Institut für Anglistik und Amerikanistik, Wien

PUBLIKATIONSMITARBEIT

Libben, G., M. Boniecki, M. Martha, K. Mittermann, K. Korecky-Kröll & W.U. Dressler (2009), 'Interfixation in German Compounds: What Factors Govern Acceptability Judgements?', *Italian Journal of Linguistics,* 21, 1, 149-180.