Kristin Kersten

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WVT Wissenschaftlicher Verlag Trier

Kersten, Kristin: Verbal Inflections in L2 Child Narratives.
A Study of Lexical Aspect and Grounding / Kristin Kersten. -
Trier: WVT Wissenschaftlicher Verlag Trier, 2009
ISBN 978-3-86821-185-6

Diese Arbeit wurde von der Philosophischen Fakultät der
Universität zu Köln als Dissertation angenommen.

Umschlaggestaltung: Brigitta Disseldorf

ISBN 978-3-86821-185-6

WVT Wissenschaftlicher Verlag Trier
Bergstraße 27, 54295 Trier
Postfach 4005, 54230 Trier
Tel.: (0651) 41503 / 9943344, Fax: 41504
Internet: http://www.wvttrier.de
E-Mail: wvt@wvttrier.de

Adult: Show me the mouth!
Child: Die Maus is nich da!

Adult: Oh, I missed it!
Child 1: Mist sagen wir nicht! Oder? Wir sagen das nicht!
Child 2: Doch, Mist ist nicht so schlimm...

Child: Tu es un mouton!
English-speaking adult: Et toi, tu es une chèvre.
Child: Non, mais toi, tu es un mouton!
Adult: Non, mais toi, tu es une chèvre.
Child: Non, et toi, tu ne me comprends pas, parce que moi, je parle français!

[You are a sheep!
And you, you are a goat.
No, but you are a sheep!
No, but you are a goat.
No, and you, you don't understand me because I, I'm speaking French!]
(A French-German bilingual child in an English-German preschool)

Child: Eric is red, Paul is dead, and Tini is fat!

Child: I love you!
Adult: I love you, too.
Child: I love you three!

Child: There's a/ (laughs) there's a #
Adult: A what?
Child: *Ich weiß gar nicht* XXX
Adult: You forgot/
Child: A *Bambi, sag ich dann eben*. (laughs)

Child: *Weißt du was Frau P. mir auch beigebracht hat? Wenn ich was nicht weiß, dann sag ich einfach was so Ähnliges!* (laughs)

[Do you know what else Mrs. P. taught us? If there's something I don't know, I simply say something similar!]

(The examples are taken from Westphal (1998), Leibing (1999), Berger (1999) and Kersten (2002, 2009a,b), and from personal notes.)

To Holger

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List of Abbreviations

ACC	accomplishments
ACH	achievements
ACT	activities
AH	aspect hypothesis
AMB	ambiguous grounding context
ASTH	*Aspectual Semantic Transfer Hypothesis*
BG	background
BTC	Basic Time Concept (Klein 1994)
DH	discourse hypothesis
DTH	defective tense hypothesis
FG	foreground
(¬)FOC	grounding context with reduced focus on main character
IL	interlanguage
L1	first language
L2	second language
LA	language acquisition
PT	*Processability Theory* (Pienemann 1998)
SLA	second language acquisition
STA	states
V-ø	base form of the verb (verbal stem)
V-ed	regular past inflection
V-irreg	irregular past inflection
V-ing	progressive form (present, past, bare progressive)
V-s	3rd person singular inflection

Acknowledgements

This study would not have been possible without the support of many mentors, colleagues, and friends. First and above all, I would like to thank Prof. Andreas Rohde for years of continuing support, encouragement, for endless enlightening nocturnal discussions, and for his friendship. His support means more to me than words can express. Heartfelt thanks also go to Prof. Chris Bongartz, who put a lot of confidence in me and supported and guided me during a very important stage of my work that has shaped my academic life.

I owe the setup of this study, and much more, to Prof. Gabriele Pallotti and Prof. Alex Housen, who were present when I took my very first steps on the academic stage, and who have accompanied me ever since – many thanks for their brilliant insights and their continuing willingness to discuss methodological issues across Europe. I am very much indebted to Sofie Derheim and PD Dr. Reinhard König for their invaluable advice concerning the statistical analysis, to Corinna Norrick for her speedy and highly competent proof reading, and to my teachers and colleagues who accompanied me during all these years and shared their experience and knowledge with me, most notably Prof. Petra Burmeister, Prof. Thorsten Piske, Christine Möller, Dr. Christine Tiefenthal, Dr. Angelika Kußmaul, Dr. Anja Steinlen and Tanja Ruthenberg, as well as to all other scholars who supported and encouraged this work, such as Prof. Manfred Pienemann, Prof. Jörg Keßler, Prof. Neal Norrick, Prof. Delia Chiaro, Elisa Everts, and Prof. David Ingram. I am also very grateful for the wonderful collaboration with *Claus-Rixen-Schule* in Kiel-Altenholz, first and foremost with Ruth Pasternak and the children of the first bilingual cohort of the school, as well as the former student research team at Kiel University that collected the data, namely Nadine Hansen, Bianca Sauer, Christine Biskup, Christine Imhoff, Jessica Bachem, and all students who helped with data transcription. Working with them was a great pleasure.

The most special thanks however must go to Prof. Henning Wode, without whom none of this would have been carried out. If it had not been for him, most of the careers of those mentioned above would have turned out very differently. He shared with us his fascination for language and shaped our way of thinking about our subject. As we agreed upon on one memorable night in Cologne when three generations of researchers sat together drinking a pint of beer, we all like to think of him as our "academic father." I owe him my academic education and path, and I am deeply grateful for his guidance and the confidence he has continually shown since the earliest time of my studies.

My family always backed me up with encouragement and patience. Deep thanks go to them, and especially to my father for his invaluable help with endless hours of tedious transcriptions and corrections. Finally, but most importantly, I owe this work to the love and continual support of my husband, Holger, who saw me me through all the ups and downs and gave me the strength to carry on until it was finally done. Thank you.

1. Introduction

Carolin (2000, Grade 1):

There is a dog and a boy and the do/ dog looking in a glass, and in the glass sitting a frog and the moon shining. And then, the boy are sleeping and the dog sleeping. And then, the boy looking in the glass and the frog is/ is not there.

Carolin (2002, Grade 3):

Ehm one night a little boy ehm has catched a little frog and put him in a glass and ehm then he took the glass and bring it in his bedroom, and then he looks at the little frog, and the frog thinks when the little boy sleeps: "I go out in the forest to my family," and ehm the light is on, and the little dog ehm looks in the glass exactly on the frog. And when the frog ehm go out of the glass in the night, the little dog and the little boy are sleeping, and ehm the moon is shining in the window, and ehm all is standing around and is dark. And when the day comes and the ehm sun shines on the glass and the little boy ehm wakes up and the dog a/ as well, ehm the glass was empty because the frog ehm in the night go ehm to his family again, in the forest.

This study focuses on eighteen German children who started learning their second language in a bilingual preschool and elementary school program. Their task was to narrate picture stories in the new language to interviewers who did not understand their mother tongue. To accomplish this task with their still limited language skills, the children needed to resort to all kinds of creative linguistic means in order to make themselves understood – a great challenge especially to the smallest children in their first year of language acquisition. However, they all managed without exception to convey the story to the adults, and the pride they took in their newly acquired skills was easily recognizable. In the course of four years of elementary schooling, we observed the development of their linguistic expression and their increase in fluency and language competence. Carolin's introductions to the story in Grade 1 and Grade 3 as quoted above are a vivid example of this process. After a period of four years, at the age of ten, all children were able to express everything they wanted to say, albeit not always grammatically target-like, yet in a fluent and linguistically complex narration style.

This study analyzes a special part of this four-year development from a linguistic point of view, namely the distribution of the verbal inflections which the children use in their picture story narrations. Since half of the group started learning English in elementary school, the data corpus is well-suited to investigate two hypotheses about the distribution of verbal morphology in early learner language: The Aspect Hypothesis (AH) and the Discourse Hypothesis (DH) make competing predictions about a skewed distribution of inflections based on different linguistic contexts. Whereas the AH ascribes a bias for specific inflections to the semantic category of the verb or predicate, the DH attributes the effect to the narrative context of foreground or background. The oral picture story narrations of the children, which were collected longitu-

dinally over a period of four years, represent an ideal corpus for the focus of both hypotheses.

This book is structured as follows: Following this introductory section, the second chapter presents the theoretical frameworks of both the Aspect Hypothesis and the Discourse Hypothesis. A special focus will be placed on different explanations for the effects observed. The third chapter will discuss some methodological issues which have been raised in previous research and which impose certain constraints on the interpretation of the data. This chapter will also discuss and explain in detail the coding conventions used for data analysis. The analysis of lexical aspect restricts itself to four well-known aspectual classes, the so-called Vendlerian *aktionsarten*. For the coding of discourse grounding it was necessary, however, to use a novel subdivision which is suited to account for a more fine-grained pattern of grounding procedures than the traditional twofold distinction of foreground and background. The fourth chapter first gives an overview of the research context (the *Kiel Immersion Project*), of the subjects, and of the data elicitation procedure. It then subdivides the data into four developmental groups. For reasons which will be explained below, these four groups do not correspond to the four grades in which the data was elicited. The groups are expected to shed light on a developmental sequence of the children's use of verbal inflections. The fourth chapter finally presents the raw data scores which underlie the data analysis, and the statistical calculations. Based on these scores and procedures, the results of the study are presented in chapter five. They are ordered according to verbal inflection. The subsequent summary illustrates the developmental sequences observed in this corpus for the distribution of inflections according to lexical aspect and grounding. The findings of this study corroborate both the predictions of the Aspect Hypothesis and the Discourse Hypothesis, as well as Bardovi-Harlig's (2000) observation that lexical aspect and discourse effects interact in early phases of second language acquisition. It becomes clear, however, that there are different time windows for sensitivity to different categories. The sensitivity to aspectual categories precedes the one to grounding, and the aspectual categories were in fact found to be even more sensitive to discourse grounding than described in earlier studies. Chapter six contains a general summary of the results, demonstrates the impact of the findings, and discusses their implications for future research.

2. Theoretical background

This study focuses on two different hypotheses about the L2 acquisition of tense-aspect morphology in English: The Aspect Hypothesis and the Discourse Hypothesis, which have both emerged within the larger framework of temporal semantics (for an overview on the development and different strands of the field, see Bardovi-Harlig 2000). This chapter gives an overview of some important concepts regarding the research of "time talk" (Smith 1980) relevant to the data analysis, and subsequently introduces the theoretical background to the two competing hypotheses, which seek to explain the distribution of verbal inflections in the beginning stages of SLA.

2.1. Distribution of verbal inflections in SLA

In his foreword to Bardovi-Harlig (2000:xi), Richard Young notes that "[b]ecause all activity takes place in time, all languages have ways in which speakers talk about time." Young identifies two traditions in the study of temporality. European studies often start "with temporal semantics and then investigate the linguistic means that learners use to express temporal concepts", whereas researchers in the North American tradition "look first at verbal morphology and then go on to investigate the patterns of emergent and developing verbal morphology" (Young 2000, in the foreword to Bardovi-Harlig 2000:xii).

Temporal concepts consist of a complex relation between the time of an utterance, the situation in which an event takes place, and the focus regarding the specific event talked about in the utterance (Klein 1994, cf. section 2.2.1). The target language exhibits a complex formal and functional interplay between means to express these relations, i.e. grammatical tense and aspect as well as semantic notions related to the event, such as lexical aspect. Tense and aspect are expressed via verbal morphology, whereas lexical aspect is inherent to the predicate, but still exerts an impact on its distribution (Bardovi-Harlig 2000). The present study will try to shed some light on how this complex interplay emerges in learner language.

2.1.1. Form vs. function

As suggested by the two different research traditions mentioned above, it is a generally accepted fact in the study of language acquisition that morphological forms and their semantic function(s) attributed by the learner need to be distinguished functionally. Some studies point to the fact that the acquisition of morphological forms precedes their target-like functional use (Klein et al. 1993, Perdue 1993).

Especially in studies on early interlanguage, it is very important to tease these two aspects apart. Applying a perspective to learner data which focuses exclusively on the grammatically target-like forms of the target language would result in running a high risk of the so-called *comparative fallacy* (Bley-Vroman 1983), which will be dis-

cussed in more detail in section 3.2.2. Although the L2 grammatical system is the target that L2 learners strive to achieve in their acquisitional process, their interlanguage system is marked by forms which differ from the target. It can thus be assumed that the *interlanguage hypotheses* a learner has about the function of a specific L2 form at a given point in time differ from the function of the respective form in the target language. In research on interlanguage development, it is consequently of vital importance to take this difference into account, in order to shed light on the developmental stages in learner language. Arguably, it might prove methodologically difficult to avoid comparative fallacy entirely. As will be argued below (section 3.2.2), empirical research lacks the objective means to gain direct access to learner hypotheses. However, certain precautions can be taken to reduce the risk of imposing target language structures on the analysis of learner language data. Differentiating between the form and the function of a grammatical phenomenon is one such way to approach the problem.[1]

Thus, studies on verbal morphology can, in broad terms, be distinguished into form-oriented (also called form-to-function, Long & Sato 1984, Sato 1990, Beretta 1995) and meaning-oriented (function-to-form) approaches (cf. Bardovi-Harlig 2000:10ff). The former focus on the distribution and patterns in the acquisition of morphological forms, whereas the latter are semantically oriented and study the expression of linguistic concepts. "In the meaning-oriented studies it is as though the researcher sets up a window on interlanguage and looks through it to see the range of linguistic devices used to express a particular concept" (Bardovi-Harlig 2000:11, she also gives an extensive overview on studies from this field.). Meaning-oriented studies have found that, as long as functional morphological differentiation of certain aspects of language is not yet possible, the learner draws on different linguistic devices to express these. Such devices are chronological order in the first so-called *pragmatic stage*, and the use of time adverbials and connectives in the following *lexical stage*; the use of (past) morphology follows in the *morphological stage* (Bardovi-Harlig 2000:12). Since the early 1970s with systematic cross-sectional and longitudinal research into learner language it has been found that the acquisition of morphosyntactical devices seems to follow a universal pattern of *developmental sequences* (Wode 1976, 1978, 1981, Ellis 1994 for an overview).

1 Other means to minimize the comparative fallacy in this study, such as the *across-category analysis* and the more fine-grained subdivision of lexical and grounding categories, will be discussed in section 3.2.2. I am grateful to Chris Bongartz (personal communication) for very helpful comments on this issue.

2.1.2. (Form) Developmental sequences in morpho-syntax

Productive morphology[2] in learner language emerges only after the use of formulas or unanalyzed chunks of e.g. ritualized expressions, and a certain period of structural and semantic simplification (for a review of the studies see Ellis 1994:83ff). The early *morpheme order studies* (Dulay & Burt 1973, 1974, Bailey et al. 1974, Larsen-Freeman 1976b, Krashen et al. 1978) were the first to systematically describe a pattern of the acquisition[3] of morphological devices in L2 English (for an overview, see Krashen 1977, Ellis 1994 or Bardovi-Harlig 2000). Krashen (1977) identified morphological devices in L2 acquisition to be acquired in the order:

1. -ing / plural / copula
2. auxiliary / article
3. irregular past
4. regular past / 3rd pers. sg. / possessive -s

However, the morpheme order studies were severely criticized for several reasons. One issue, which will be discussed in more detail in section 2.1.3, is the arbitrariness of the percentages used to determine the status of "target-like use" of an inflection. Wode et al. argue that

> by focussing on the relative chronology of target-like mastery of several items, this approach necessarily misses all the developments leading toward and preceding the final state of achievement. (Wode et al. 1978:181)

He also criticizes the arbitrariness in the selection of morphemes, which combine inflectional and derivational morphemes as well as auxiliaries (Wode 1981). Furthermore, it is questionable whether cross-sectional data are suited to reveal developmental sequences, which are acquired over a longitudinal process, and whether they can be compared to each other (Rosansky 1976). Bardovi-Harlig (2000:6) adds that

> the early studies … examined the order of acquisition of the morphemes themselves, but did not investigate the acquisition of verbal morphology as representing a tense-aspect system in its own right.

Later studies identified a more fine-grained pattern of the emergence of morphosyntactical structures in learner language. In this developmental sequence, V-ing and the past inflections appear in stage 2, and the use of 3rd pers. sg. -s appears in stage 5 of the implicational table (Johnston & Pienemann 1986). For verbal morphology, Pienemann & Johnston (1987) suggest the following sequence (Table 2.1):

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2 Learners use morphemes such as past -ed or plural -s productively if they apply them to a variety of lexemes to indicate a linguistic function, without having derived their combination from the input as a chunk.

3 The terms "acquisition" and "learning" are used interchangeably throughout this study, although some researchers have made a distinction between the two terms (e.g. Krashen 1981). The same holds for the terms "order", "sequence" or "pattern" of acquisition (for a differentiation, which is useful in specific contexts, see Ellis 1994:73).

Stage	Verbal inflection
6	(gerund)
5	3rd pers. sg. -s
4	aux + V-ed, aux + V-ing
2 + 3	V-ing, irregular past, regular past
1	words, formulae

Table 2.1: Tentative developmental stages of verbal morphology (based on Pienemann & Johnston 1987)

Without differentiating between young and adult learners, general tendencies in L2 English show that the process of acquisition is slow and gradual, that form precedes function (e.g. Véronique 1987), that irregular forms are acquired prior to regular forms (see also Rohde 1996, E. Lee 1997, Salaberry 1999, Kaplan 1987), and that compound verbs are acquired by using the verb with the respective suffix, disregarding the auxiliary form (Bardovi-Harlig 2000, see also Klein et al. 1993, Dietrich 1995, Dietrich et al. 1995).

A special focus on the emergence of past morphology is useful with regard to the specific research question of this study. In her 1998 and 2000 studies, Bardovi-Harlig described the order of inflections indicating the past paradigm as *simple past ⇨ past progressive ⇨ present perfect ⇨ pluperfect*. Similar results had repeatedly been found in earlier studies (Bailey 1989, Klein et al. 1993, 1995, Dietrich 1995, Schlyter 1990). Learners seem to exhibit a tendency to overuse the present perfect for (simple) past contexts. This observation has been explained by the high degree of semantic overlap between the two forms (Inoue 1979; Smith 1981, Bardovi-Harlig 2000). Some authors made an attempt to explain the order of acquisition mentioned above by the morpho-syntactic complexity of the specific forms (Gathercole 1986, Johnson 1985, Smith 1980). According to Bardovi-Harlig, this attempt falls short of explaining the relatively late emergence of the pluperfect, because formally it does not differ distinctively from the present perfect, which is acquired earlier. The form is, however, not used as frequently in the input as the present perfect. In summary, as Ellis puts it,

> [t]he existence of developmental sequences is one of the most important findings of SLA research to date. There is now general acceptance in the SLA research community that the acquisition of an L2 grammar, like the acquisition of an L1 grammar, occurs in stages. However, it should be noted that although general developmental sequences have been attested in learners in different situations and with differing backgrounds, variations in the specific order in which particular features occur have also been found. (Ellis 1994:21)

2.1.3. The acquisition criterion

It has to be pointed out that, up until now, studies have used a wide array of different operational criteria for acquisition. This makes the comparison of the findings especially difficult. Early studies (e.g. Dulay & Burt 1980) focus on the rate of accurate

use. According to this criterion, a feature is defined as acquired when its correct use ranges within e.g. 80-90%. This criterion has been severely criticized, however, because the cut-off point between the status of ± acquired remains arbitrary (e.g. Hatch 1978, 1983, Long & Sato 1984, Lakshmanan & Selinker 2001) and because it ignores the emergence and the development of the acquisition of inflectional morphology. Moreover, it would require the logical assumption that features used with higher accuracy have to be acquired before features used with a less accurate frequency (Wode et al. 1978). This assumption remains to be proven (Ellis 1994:21).

More recently, other researchers have used the criterion of onset or emergence (e.g. Bickerton 1981 in Ellis14, Bardovi-Harlig 2000, Pienemann 1998, 2005), also defined as the moment "at which certain operations can, in principle, be carried out" (Pienemann 1998:138), referring to the processing capacity of the learner at a specific state of interlanguage (Selinker 1972). Elsewhere, (Pienemann 1984:191) emergence is described as the "first systematic use" of a structure in question, or as "'first clear use' (i.e., first clear, novel example of a grammatical element or construction)" (Lakshmanan & Selinker 2001:402, based on Stromswold 1989, 1996). Although Lakshmanan & Selinker doubt that emergence is suited as well for morphological structures as it is for syntactic structures, they argue that it is a viable method to avoid what has been called the *comparative fallacy* in SLA (Bley-Vroman 1983, cf. discussion in section 3.2.2).

As Pallotti points out (2003, 2007, see also Kersten 2004, 2009a), there is, however, a certain arbitrariness to the definition of "first systematic use" as well: The *first* use logically needs to encompass more than one occurrence in order to be called *systematic*. It is therefore vital to each study in the development of linguistic forms to clearly lay out the operational criteria used as cut-off points for acquisition in order to warrant comparability between different studies (see also section 2.2.2.3).

2.1.4. (Function) Temporal structure in morpho-syntax

The acquisition of verbal morphology always takes place within the context of specific semantic functions which are expressed by the learner. In contrast to L1 acquisition, in L2 acquisition a cognitive separation of form and function is possible, since even the young learner can draw from already established (L1) concepts which need to be expressed in a different form in the L2 (von Stutterheim & Klein 1987:194). According to Bardovi-Harlig's (2000) review, in the early stages of acquisition, when the respective formal means of temporal encoding are not yet acquired, the learner resorts to four different strategies of expression:

a) scaffolded discourse (the learner relies on contributions of other speakers)
b) implicit reference inferred from the context
c) contrasting of events
d) the chronological order of events

In learner language, these principles are often used in combination. Chronological order is not restricted to LA but also relied upon in the speech of native speakers (Schumann 1987). It is seen as the general distinguishing principle of narratives (Dahl 1984, Schiffrin 1981) and its importance to the data in question will become obvious in later chapters:

> Chronological order … is such a central characteristic of narratives that some linguistic definitions of narrative rest on that fact alone. For example, Dahl defines a narrative as a text in which "the speaker relates a series of real or fictive events in the order in which they occurred" (1984, p. 116). Without evidence to the contrary, series of events are understood as sequential … The distinction between interlanguage and primary language lies not in the use of chronological order, which is common to all narratives, but in the recourse to other means of signaling temporal reference. (Bardovi-Harlig 2000:64f)

The predominant use of lexical means to express temporality represents the second stage in SLA time talk (Bardovi-Harlig 2000:36). During this stage, connectives (e.g. Meisel 1987: *and, because, and so*) and temporal / locative adverbials (Trévise 1987, Véronique 1987) are most frequently used. It has been shown that adverbials are also acquired in a specific order according to semantic types (for an overview see Bardovi-Harlig 2000:73).

After relying heavily on adverbials in the early stages of SLA (such as e.g. *then, and then, now* etc.), learners start to use verbal morphology in the *morphological stage*, although this use remains unsystematical, especially in the beginning stages (Meisel 1987, Schumann 1987). Other coding strategies (adverbials, chronological order) are retained but the amount of their use changes. Once the use of past morphology is stable, it has been observed that the acquisition of other, more complex morphological forms relies on the same sequence of strategies: i.e. the use of adverbials to indicate a deviation from chronological order (Klein 1986), e.g. to mark the pluperfect, with the subsequent acquisition of the respective morphological marking. Another strategy to mark this deviation is emerging syntax, i.e. subordinate clauses, which indicate anteriority or causal relationships (Klein & Perdue 1992, von Stutterheim 1991). Bardovi-Harlig (2000) suggests that

> [i]t is possible that this cycle of lexical to morphological marking occurs throughout the tense-aspect system whenever new forms – and meanings – are added to the system (2000:47),

concluding that different strategies of temporal marking interact with variable frequency throughout the whole acquisition process (p. 48). In her 1992 study, Bardovi-Harlig found for instance that the use of adverbs of beginning learners decreases with time and use of target-like (past) morphology. However, the use of adverbials remains higher in learner language than in native speaker utterances throughout the evaluated process.

2.1.5. Summary

The two hypotheses which are in the focus of this analysis, the *Aspect Hypothesis* and the *Discourse Hypothesis*, have emerged within the field of temporal semantics. Both hypotheses make predictions about verbal morphology in learner language. The distribution of verbal inflections is intertwined with the temporal notion of each proposition. It is thus necessary to tease apart the forms of verbal inflections and their various respective functions in the linguistic context. Two linguistic schools have approached these issues in different ways. European studies used to start out with the semantic notions and subsequently analyzed the linguistic means to express them *(function-to-form studies)*, whereas the North American tradition focused on morphological forms first, and then moved on to investigate their functions (*form-to-function studies*, summarized in Bardovi-Harlig 2000:10ff). Both meaning- and form-oriented studies found a development in the expression of temporality in learner language characterized by different stages. Learners first go through a *pragmatic stage* and a *lexical stage*. These are characterized by scaffolded discourse (learners rely on contributions of other speakers), implicit reference which is inferred from the context, the contrasting of events, and the chronological order of events, before learners are able to make use of time adverbials and connectives. Finally they move on to the *morphological stage*, in which verbal inflections are increasingly used according to their grammatical functions in the target language. It has been claimed that the acquisition of morpho-syntax takes place according to a universal pattern. Early *morpheme order studies* revealed that V-ing is the first inflection to appear in the interlanguage, followed by past inflections and finally the 3rd person -s. Although subject to much criticism, this general tendency has been corroborated and refined by methodologically more rigorous studies (e.g. Pienemann & Johnston 1987, Pienemann 1998). For past morphology, Bardovi-Harlig (1998, 2000) identified the developmental sequence *simple past ⇨ past progressive ⇨ present perfect ⇨ pluperfect*.

Determining the exact criterion of when a structure can be regarded as *acquired* in an interlanguage system has proved a methodological challenge to many studies. Any percentage of target-like use of an inflection as a cut-off point for its acquisition has to remain arbitrary to some point. To circumvent this problem, the criterion of the first systematic *emergence* of a structure has been proposed (Pienemann 1998). According to Pienemann's *Processability Theory*, the *emergence* of a structure reveals the point in time at which it can, in principle, be processed by the learner's grammatical processing system.

2.2. Lexical aspect and verbal morphology

One of the two prominent hypotheses investigated in this study predicts that the acquisition of verbal inflections is influenced by the lexical aspect inherent to the predicate (cf. section 2.2.1.2). The description of aspect is a much-discussed topic in linguistics.

This section will outline terminological issues concerning the concept of *aspect* and will move on to place the concept of *lexical aspect* within this framework. Since aspect is naturally intertwined with the expression of tense, a differentiation between the two is useful at the beginning. The section will then move on to the distinction between *grammatical* and *lexical aspect*, and finally place the discussion within the framework of *aktionsarten*, which the Aspect Hypothesis relies upon.

2.2.1. Tense and aspect

In the linguistic discussion of temporality, the theoretical distinctions between tense on the one hand and different forms of aspectual relations on the other have been controversial. It is not the intention of this study to reanalyze all structural concepts which have been suggested so far (for a very detailed overview see Housen 1995). Rather, I will present a framework of definitions for tense and aspect which will be useful for the terminological differentiation needed in the present study.

A very analytical framework of temporal relations which has also proven useful for the coding of learner narrations (e.g. Dietrich et al. 1995) has been proposed by Klein (1994) in his *Basic Time Concept* (BTC). According to Klein, all tense and aspect relations are grammaticalized temporal relations which can be described by referring mainly to three different perspectives in time talk, i.e. the time at which the speech utterance is performed (*time of utterance* or TU), the time of the topic which is related and which represents the finite unit of the proposition (*topic time* or TT), and finally the (non-finite) time of the situation at which the topic is located (*situation time* or TSit, Klein 1994:3ff). In contrast to this, earlier approaches such as Reichenbach (1947) always use TU (Reichenbach: "point of speech") as reference point.[4] Klein's basic assumption is that **tense marking** describes the relation between *topic time* (TT) and the *time of utterance* (TU), whereas **aspect marking** concerns the relation of *topic time* (TT) with the time of its respective *situation* (TSit). Tenses in the English language, in Klein's model (1994:124), are expressed as:

Present tense: TU INCL(uded in) TT
Past tense: TU AFTER TT
Future tense: TU BEFORE TT

Instances of aspect, on the other hand, are specific temporal relations inherent to the situation, and they are first and foremost semantic concepts. These semantic aspectual notions can be expressed by lexical items such as adverbials (explicit expression), and by inherent properties of the predicate (implicit expression). Whether and how these concepts are expressed by grammatical morphemes varies among different languages (Comrie 1991, Klein 1994). The fact that these different forms of aspectual expression

4 Unlike Klein, Reichenbach (1947) does not differentiate between points in time and time spans (he just refers to point of speech, event and reference), an important distinction which will be illustrated in the next section.

are closely intertwined and that the term *aspect* has been used for different forms of aspectual notions has led to some systematic and terminological overlaps in recent discussions (Binnick 1991, Bußmann 2002:99f).

The following section will sketch the difference between grammatical and lexical aspect marking (for a detailed theoretical discussion cf. e.g. Housen 1995, Rohde 1997).

2.2.1.1. Grammatical aspect

Aspectual distinctions which are expressed grammatically have been called, among others, *aspect* (e.g. Comrie 1991), *true aspect* (e.g. Binnick 1991), *viewpoint aspect* (Smith 1991, Brinton 1988) or *grammatical aspect* (Shirai & Andersen 1995, Rohde 1997, Bardovi-Harlig 2000, among others). Klein defines aspect "in terms of temporal relations between time spans" (1994:119), i.e. the relation between TT and TSit, and according to Comrie (1991:5) "[a]spect is not concerned with relating the time of the situation to any other time-point, but rather with the internal temporal constituency of the situation". However, only a subset of all possible relations are expressed in natural languages. Among those expressed most often are what Klein calls the *perfective, perfect, imperfective,* and *prospective* relation:

> [A]spects are definable in terms of temporal relations between time spans. What is particular about aspects is not the nature of these relations but the time spans between which they obtain – the time of situation and the topic time. The relations themselves are the normal ones, as defined by the Basic Time Concept, for example BEFORE, AFTER, INCL, or combinations of those. In principle, many such combinations could be chosen as aspects, but only some of them seem to be encoded in natural language. […] we defined four such combinations as aspects: PERFECTIVE, PERFECT, IMPERFECTIVE and PROSPECTIVE. These four are often found encoded in natural languages; but this surely does not exclude other possibilities. (Klein 1994: 119)

An important aspectual distinction has thus to be made, i.e. whether an event is seen as whole, or as completed, or not. The notion of completedness pertains to the perfective, as opposed to a non-completed imperfective event. Comrie (1991:3) defines that if

> the whole of the situation is presented as a single unanalysable whole, with beginning, middle, and end rolled into one; no attempt is made to divide this situation up into the various individual phases that make up the action of entry. Verbal forms with this meaning will be said to have perfective meaning, and where the language in question has special verbal forms to indicate this, we shall say that it has perfective aspect.

If, on the other hand, the focus is concerned with the "internal structure of the situation", looking at it "from the inside" (pp. 4f), this aspect is called imperfective. Comrie points out that the grammatical realization of these two aspects is not straightforward in English. It is partly expressed via the use of the progressive vs. the non-progressive, but this does not hold for so-called stative verbs (cf. section 2.2.1.2) or for habitual meaning. Imperfective aspect in English is thus realized as either the progressive (*John*

was working) or the habitual aspect (*John used to work here*; p. 25). Comrie furthermore holds that imperfective aspect cannot be used with verbs expressing punctuality.

In Klein's view, traditional notions such as "completed" or "seen from the inside" are seen as a metaphorical description which results from the temporal relation between the topic time and the situation time rather than as a prerequisite for the definition of (grammatical) aspect. However, his BTC does not deviate in this respect from Comrie's discussion but simply operationalizes the different relations (adapted from 1994:108):

IMPERFECTIVE:	TT INCL(uded in) TSit	*John was painting a picture.*
PERFECTIVE:	TT AT TSit	*John painted a picture.*
PERFECT:	TT AFTER TSit	*John had painted a picture..*
PROSPECTIVE:	TT BEFORE TSit	*John was going to paint a picture.*

The perfect in English is worth mentioning specifically, since it is sometimes described as having an intermediate status between tense and aspect, partaking of both the present and the past, or linking "a present state to a past situation" (Comrie 1991:62). Klein elaborates on this definition within his BTC. The following representation shows an analysis of the English perfect with the middle column depicting the tense status, and the last column the aspect status, of the perfect (1994:131).

English Perfect:	Temporal unit	Aspectual unit
Present Perfect	TU INCL TT	and TT AFTER TSit
Pluperfect	TU AFTER TT	and TT AFTER TSit
Future Perfect	TU BEFORE TT	and TT AFTER TSit

Dietrich et al., who applied Klein's BTC in their 1995 study of learner language, give more examples of the interdependent relationship of tense and (grammatical) aspect in English (p. 24f):

The stork had swallowed the frog.
TT before TU TT after TSit

The stork was swallowing the frog.
TT before TU TT in TSit

The stork swallowed the frog.
TT before TU TT at TSit (includes part of action + part of time after TSit)

In these example sentences, the relation between the *topic time* TT and the *time of utterance* TU remains stable, i.e. in the past tense, whereas the aspectual relation between the *topic time* TT and the *situation time* TSit, which the topic time refers to, varies between PERFECT, IMPERFECTIVE and PERFECTIVE aspect. Table 2.2 presents a summary of those grammatical or viewpoint aspectual notions most commonly encoded in English.

Viewpoint Aspect				
IMPERFECTIVE		**PERFECTIVE**	**PERFECT**	**PROSPECTIVE**
TT INCL TSit		TT AT TSit	TT AFTER TSit	TT BEFORE TSit
{--[----]--}	{-[--]--[--]--[--]-}	{-----[---}] [{--------}]	{--------} [ ]	[ ] {--------}
not completed	habitual	completed, only partly in post-time	completed in post-time	completed in pre-time
progressive	*use to,* simple form	simple form	perfect (pres/past/fut depends on tense = rel. TT and TU)	*going to,* lexical marking *(about to, almost)*
Andy was sleeping	*Andy used to sleep*	*Andy slept*	*Andy had slept*	*Andy was going to sleep*

Table 2.2: Summary of viewpoint aspect, adapted from Klein (1994), Comrie (1991)
TT – topic time; TSit – situation time, [--] – TT; {--} – TSit

2.2.1.2. Lexical aspect and situation types

The second important differentiation in the discussion of temporal and aspectual categories is the distinction between grammatical or viewpoint aspect and situation aspect (e.g. Binnick 1991) or *lexical aspect* (e.g. Timberlake 1985), expressed e.g. by different *situation types* (e.g. 1991:13, Quirk et al. 1985). Similar to the distinction of tense and (grammatical) aspect, the terminology of these two kinds of aspect has been subject to some confusion (e.g. Thelin 1990:6), as both phenomena overlap or are at least semantically related:

> Die Verwandschaft zwischen den beiden verbalen Kategorien [grammatical vs. lexical aspect] zeigt sich darin, dass die Bildung verschiedener A[spekt]-Formen durch die Aktionsart des Verbs gesteuert wird. (Bußmann 2002:100, additions in square brackets are mine)

The term *aktionsart* (Agrell 1908, Vendler 1957) will be used here in the sense of Comrie's broad definition that

> aktionsart represents lexicalisation of the [semantic] distinctions, irrespective of how these distinctions are lexicalised; this use of aktionsart is similar to the notion of inherent meaning (Comrie 1991:7, additions in square brackets are mine)

Lexicalization of inherent meaning refers to the fact that the semantic content of a linguistic element, most importantly of the predicate itself (Bardovi-Harlig & Reynolds 1995, cf. section 2.2.1.3),[5] carries some aspectual notion pertaining to the situation it

5 Bardovi-Harlig & Reynolds (1995:109) clarify: "We use the terms state verbs, activity verbs, and so on to refer to the members of the lexical aspectual classes. However, as noted earlier, the relevant unit is generally considered to be the predicate or verb phrase as in be tall, sing a song, or read a book."

refers to. As Pustejovsky (1992) points out, the semantic aspect inherent to the verb can be changed or overridden by composition with other semantic or syntactic elements in the sentence (cf. Rohde 2002a:137). It is thus important for the event structure to take the whole predicate into account instead of solely focusing on the verb.

There are many different systematic frameworks of aspectuality which include a fine-grained analysis both with respect to the distinguishing features and with respect to the number of lexical aspectual classes (for an extensive overview cf. e.g. Binnick 1991, Brinton 1988). I will adopt the term *situation type*[6], as coined by Quirk et al., as a generic description of the categories of inherent semantic aspect as denoted by the verbal function.

In terms of definition of the technical terms applied in this study, it is now necessary to take a closer look at the terminological discussion of situation types. In event semantics, for instance, the term *event* represents the general category of *situation* (also called *eventuality* elsewhere, e.g. Bach 1986) as an irreducible conceptual entity on the one hand; on the other, and at the same time in a narrower sense, *event* depicts a subcategory of the more general term *event/situation* (together with states and processes, Bußmann 2002:196).[7]

There are, however, differing subdivisions among these subcategories in the narrower sense. Jackendoff (1983) differentiates between states, events, and actions as situational primitives, with "What happened was..." and "What x did..." as a diagnostic test for the difference between events and actions (p. 179). In his proceeding argumentation, actions are treated as a subset of events, and later neglected in the analysis. Jackson (1990) uses the same threefold distinction (states, events, and actions), but with events and actions on the same hierarchical level, i.e. as subcategories of non-states (p. 15). Loosely following Quirk et al.'s (1985:200ff)[8] terminology, he subdivides his event category into *goings-on, process, momentary event,* and *transitional event*; and actions into *activity, accomplishment, momentary act,* and *transitional act.* He thus directly integrates *aktionsart* into his hierarchy of situation types, albeit in a manner different from other approaches (cf. also Quirk et al, p. 201).

As Pustejovsky (1992) points out, most linguistic theories differentiate between the aspectual classes *states*, *processes (activities)*, and *events*, the latter being composed of *accomplishments* and *achievements* (all of which, to add to the confusion, are classified as actions by Jackson[9]). This view goes back to Vendler's (1957) influential analysis of lexical aspect, on which most of the following research was (and still is)

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6 This is equivalent to what Pustejovsky (1992:48) calls event type.

7 Jackendoff (1983) considers Events and States as primitives and later introduces "Situation" as a supercategory to both Events and States.

8 Quirk et al. (1985:177) point out that semantic categories of time denoted by verbs are "variously called 'states', 'events', 'actions', 'processes', 'activities' etc." They refer to these different categories with the generic term situation types.

9 I will henceforth avoid the use of *action* as a category of semantic situation type, since it is not solely a category of lexical aspect but, as Jackendoff (1983) underlines, additionally expresses the semantic role of actor.

based. Andersen & Shirai (based on Mourelatos 1981) illustrate this hierarchical organization of categories in their influential work on lexical aspect (**Figure 2.1**):

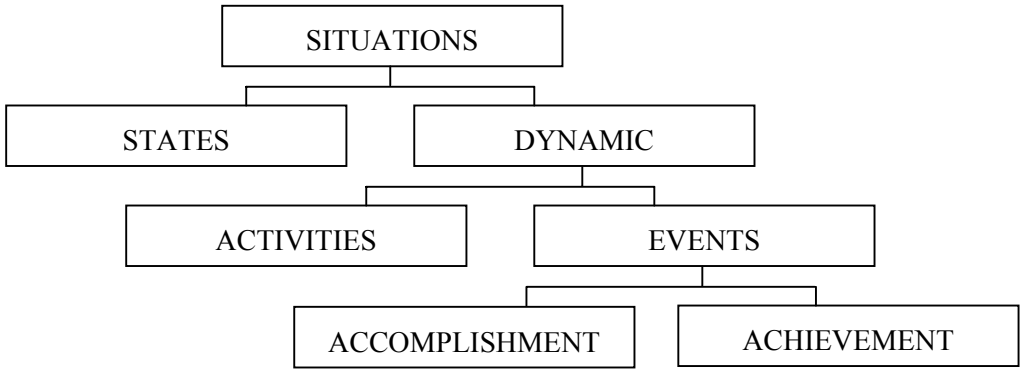

Figure 2.1: Hierarchy of situation types (adapted from Andersen & Shirai 1994:135 "The Vendler-Mourelatos hierarchy")

They describe these categories as follows (p. 134f):

States contrast with dynamic actions in that states exist indefinitely without input of energy, whereas *dynamic actions* require input of energy. *Dynamic actions* are subcategorized into *activities*, which are durative and have an arbitrary end point, and *events*, which have an inherent end point. Finally, *events* are of two types: *accomplishments* have a durative element that precedes the final end point, whereas *achievements* are momentaneous, that is, the end point is also the beginning point.

These four distinct Vendlerian *aktionsarten*, i.e. *states*, *activities*, *accomplishments*, and *achievements* thus contain different aspectual notions inherent in the verb or the predicate: they differ in the semantic features they comprise, i.e. in the features ± *punctual*, ± *dynamic*, and ± *telic.* Table 2.3, taken from Andersen & Shirai (1994:134), gives an overview of the four *aktionsarten* identified by Vendler (1957) and their distinguishing features.

A. Semantic Features				
	States	Activities	Accomplishments	Achievements
Punctual	–	–	–	+
Telic	–	–	+	+
Dynamic	–	+	+	+
B. Examples				
	State	Activity	Accomplishment (Telic Event)	Achievement (Punctual Event)
	have	run	paint a picture	recognize (someone)
	possess	walk	make a chain	realize (something)
	desire	swim	build a house	lose (something)
	want	push	write a novel	find (something
	like	pull	grow up	win the race

Table 2.3: Inherent semantic aspect (taken from Andersen & Shirai 1994:134).

The feature *dynamic* denotes that not all phases or stages of a situation are identical, which holds for *activities* as well as for *accomplishments* and *achievements* but not for *states* (Binnick 1991:183). Thus, there is a natural binary opposition between *stative* vs. *dynamic*. Garey (1957, quoted in Binnick 1991:189) first coined the term *telic* for bounded events which semantically include an endpoint, goal or culmination, such as "paint a picture" or "run a mile". Thus, they consist of an initial state, a transition phase, and a final state. This is true for both *accomplishments* and *achievements*, but not for *activities*, which are considered unbounded situations, such as "paint" or "run".[10] Activities are consequently called *atelic* verbs/predicates. Punctual events are defined as "occurring at a point in time" (Binnick 1991:194) or involving a single, instantaneous change of state" (Dowty 1979), as in "notice" or "reach the summit". *Punctuality* only pertains to *achievements*, whereas the other situation types are *durative*. Housen (1995) cautions, however:

> It is important to stress that these features and categories are abstractions and that it is infelicitous to think of them in strictly dichotomous terms; the categories are *fuzzy* and the distinguishing features represent semantic *continua* rather than binary categories. The human mind probably does not conceive of situations as either punctual or durative but rather as being *more or less* durative or punctual. Both *arrive*, *cough* and *flash* are considered as essentially punctual, but objectively speaking *flash* is more punctual than *cough* or *arrive*. Similarly, *be tall*, *sleep tightly* and *stand on the corner* are stative,[11] but the former more so than the latter. Consequently, certain situations/predications are more typical members of their categories than other, more borderline cases. Introducing more distinguishing features to accommodate for problematic classifications would be ultimately self-defeating, however. (Housen 1995:51; insertion in square brackets is mine)

A good example for the continuum nature of such features is the difference of the conceptualization of *completedness* in the two examples "I wrote a book" and "I sang a song" (Rohde 1997). While in the first example, the action is supposed to be completed, the second example does not necessarily imply that the song was sung in its entirety. This view of mental categorization in terms of prototypicality and fuzziness (cf. Eleanor Rosch's influential *prototype theory*, e.g. 1973, Rosch et al. 1975, 1976, see also the work by Lakoff 1987, Langacker 1987) is highly relevant for a theoretical

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10 Note that in real-life situations, processes like painting and running are naturally bounded as they have to be kept up with the input of energy, unlike states such as "knowing something". However, the notion of boundedness in the analysis of lexical aspect refers to the temporal focus of the predicate in relation to the context just as the imperfective focus in the discussion of viewpoint aspect. This does not mean, however, that *activities* are always expressed by the imperfective grammatical inflections (cf. Binnick 1991:190), but a prototypical use of *activities* with the imperfective aspect might be explained by the overlap of distinguishing features. Smith (1983, quoted in Rohde 1997:29) thus differentiates between natural endpoints for *achievements* and *accomplishments*, and arbitrary endpoints for *activities* and *states*.

11 In the present analysis, some of these examples are classified differently according to test questions specified in 3.2.3.

explanation of the effects observed in studies of lexical aspect (cf. section 2.2.2.2). I do not agree, however, with Housen's view that "the human mind probably does not conceive of situations as either punctual or durative". The central claim of prototype theory is that there is a core meaning of concepts that includes all semantic features which define the respective category. It is this core meaning which constitutes the prototype. This does not contradict the notion of a continuum. In fact, the *fuzzy edge* of a category only makes sense in relation to a core nucleus; an undivided continuum does not entail fuzzy or non-fuzzy parts. Prototypes are the core members of a category, and it is in the nature of categories to subsume only such members which entail a sufficient, meaning constituting number of semantic features. Without the prototype, the human mind would lack the capacity of classification, since the prototype constitutes the core meaning and thus represents the means of comparison for each new stimulus whose meaning has to be processed in a matter of milliseconds.

> ... at any time we either produce or understand any utterance of any reasonable length, we are employing dozens if not hundreds of categories: categories of speech sounds, of words, of phrases and clauses, as well as conceptual categories. Without the ability to categorize, we could not function at all, either in the physical world or in our social and intellectual lives. An understanding of how we categorize is central to any understanding of how we think and how we function, and therefore central to an understanding of what makes us human. (Lakoff 1987:6)

Therefore, without core meanings, or, in other words, in a homogenous semantic continuum, the mental processing of any kind of information would necessarily have to be much slower.

Fuzzy members of a category are those members which entail only some but not all sufficient features of one category, as well as some features of another one. Hence, they are closer to a different category in the continuum than the prototype. It is thus helpful for the problem of binary features of lexical categories to represent the continuum as a continuum of prototypical categories rather than an undivided, homogenous one. In contrast to Housen, I would hold that the human mind is very likely to differentiate between punctual and durative situations, but in effect, it has to cope with many situation types which neither prototypically represent one or the other to a full extent. As a matter of fact, this is a very relevant issue for the explanation of the phenomena in question in this study. The possible effects of this theory on the acquisition of lexical aspect are discussed in section 2.2.2.2 below.

2.2.1.3. Vendler's *aktionsarten*

As Rohde (2002a) points out, verb classifications according to lexical aspect take different forms in the literature. The Vendler classes have been refined repeatedly.[12] For

12 Quirk et al. (1985), Jackson (1990), Pustejovsky (1992), Robinson (1995), to mention just a few. In his later work, Jackendoff (esp. 1990, 1992) also integrates several fea-

reasons of comparability, this study will use the four classes of *aktionsart* as presented by Vendler (1957) and Dowty (1979) for data analysis, as they represent the most basic and unambiguous subcategories and have been used frequently by many researchers in studies of lexical aspect. As Housen (1995) points out, the fact that this categorization has been found valid in many different languages suggests its qualification as both a linguistic and a conceptual universal: "In short, it represents a classification of both situations (or rather their cognitive representation in the human mind) and of linguistic expressions of situations" (Housen 1995:44). The following definitions are adapted from Rohde (2002a:136, the notation in small caps indicates semantic relevance):

STATES (STA):	no dynamics, continuing without additional effort or energy being applied (*see, love, hate, want,* etc.)
ACTIVITIES (ACT):	duration, but without endpoint or goal (*run, walk, play, sing,* etc.)
ACCOMPLISHMENTS (ACC):	some duration, but including endpoint or goal (*run a mile, make chair, built a house,* etc.)
ACHIEVEMENTS (ACH):	instantaneous change, reducible to a single point in time; this point representing the endpoint or goal (*recognize, die, reach the summit,* etc.)

The type-shifting phenomenon

The examples "run" for activities and "run a mile" for accomplishments elucidate why the focus on the verb alone is not enough to determine the situation type. The classification depends on the full predicate, as the verb's argument(s) are, in many cases, the determining factor for the semantic features of the situation (Verkuyl 1988, Bardovi-Harlig & Reynolds 1995). In other cases, adverbials or contextual information contribute to the lexical aspect of the predicate. Several test questions have been developed for the different semantic features, which take this additional information into account (cf. section 3.2.3). For this reason, Bach (1986) refers to these as "type-shifting phenomena". In the case of the example above, the complement "a mile" appends an endpoint to the otherwise unbounded process of running.

The advancement of the theory with regard to these phenomena becomes evident in a careful reanalysis of original literature on the topic. Dry (1983), for instance, a source often referred to for the interrelation of lexical aspect and discourse structure, analyzes the following sequence:

(e) It was an island now, not long to endure …
(f) All about it, the earth gaped [ACT: imp.].
(g) and from deep rifts and pits smoke and fumes leaped up [ACC: imp.].

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tures and functions expressing categories of semantic aspectual distinctions into his model.

(h) Behind them the mountain was convulsed [STA: imp.].
(i) Great rents opened in its side [ACC: imp.].
(j) Slow rivers of fire came down the long slopes toward them [ACC: imp.]. …
(k) A hot rain of ash was falling [ACT: imp.].
(l) *They stood now* [ACC: perf.].
(m) and Sam still holding his master's hand *caressed it* [ACC: perf.]. …

(*The Return of the King,* p. 281; taken from Dry 1983:29)

A careful reanalysis which takes the predicate with its adverbials and arguments into account,[13] however, renders (g) an ACT. In this case, the ACC[14] verb *leap up* stands in an imperfective context and the test question "When you stop while V-ing, have you V-ed?" has to be answered in the affirmative: when stopping while leaping up, smoke and fumes have indeed leapt up before. Thus, the predicate takes an iterative meaning in this context and the ACC reading of a single leap shifts to a process reading of the situation. The same holds for (i) (STA) and (j) (ACT). When applying the same test, even if stopped, the rivers would have come toward Sam and Frodo before, consequently turning the telic semantics of the verb into a process.

The interesting issue in this example is that the ACC or ACH reading of *come down* is altered by what Jackendoff (1992) would call the PATH complement of the clause *toward*, as well as the semantics of the context that a river is continually flowing. Jackendoff parallels the aspectual-temporal system with the system of spatial relations. He claims that these features taken from *Gestalt psychology* have psychological reality (e.g. Wertheimer 1938) and have their counterparts in the processing of spatial relations. In this analogy, TOWARD and AWAY-FROM represent the conceptual functions of Direction which do not include the Source or Goal of the proposition, unlike the two PATHS "to the house" and "from the house", which include the PLACE argument "the house" and are therefore bounded by the place. Thus, Jackendoff describes the two spatial PATH functions TOWARD and AWAY-FROM as unbounded (1992:36). This analysis has direct consequences for the telicity of the respective predicates: predicates complemented with a PATH terminating at a Goal must be telic,

13 The diagnostic tests used for the reanalysis, which underlie the coding of this study, are described below in section 2.2.2.2. (*The Prototype Principle*).

14 It could be argued that the verb *leap up* could be classified, out of context, as an ACH verb as well: the extension in time included in *leap* depends on the subject which is carrying out the leap. Prototypically, one would expect some animate being with the ability to move quickly (semantically, *to leap* seems to entail some form of speed). In this case, the verb would describe a rather instantaneous change of state and should be classified as an ACH. In the case of (g), however, the subject *smoke and fumes*, the context suggests a rather slow(er) motion which, by necessity, would have a longer extension in time. As a matter of fact, the semantic features of subject and verb seem to clash to some extent in this example, which renders the classification as ACC justifiable in this juxtaposition.

i.e. ACCs, whereas predicates with a PATH function of Direction belong to the unbounded or atelic category and therefore represent ACT verbs.[15]

The interaction of lexical and grammatical aspect

Both lexical and grammatical aspect are neatly intertwined not only terminologically but also theoretically (Bußmann 2002), but they are not identical nor interchangeable. To give an example: although both activities (lexical aspect) and the progressive inflection V-ing (viewpoint aspect) share the feature *+durative*, this does not mean that durativity in lexical aspect automatically entails imperfectivity in grammatical aspect. Durativity denotes that a situation lasts for a specific period of time; nevertheless, it does not include the focus on the internal structure (imperfective) or the completedness (perfective) of this period. A predicate can express duration with or without expressing imperfectivity at the same time, as in "He was standing there for an hour" vs. "He stood there for an hour" (Comrie 1991:41). This is why the opposite of durativity is not perfectiveness, but punctuality. And although punctual events are incompatible with an imperfective aspect, they can nevertheless take the progressive form. In such cases, however, the meaning of the proposition will be iterative (Comrie 1991:42f), as in "He was jumping up and down". With respect to telicity, Comrie states that

> [t]he particular importance of the telic/atelic distinction for the study of aspect is that, when combined with the perfective/imperfective opposition, the semantic range of telic verbs is restricted considerably, so that certain logical deductions can be made from the aspect of a sentettnce referring to a telic situation that cannot be made from the aspect of a sentence referring to an atelic situation. For instance, a perfective form referring to a telic situation implies attainment of the terminal point of that situation … which imply that the chair was completed. The imperfective forms carry no such implication, and imply rather that the chair had not been completed at the time referred to ... (Comrie 1991:46)

It cannot be denied, however, that both forms of aspect have a mutual influence on each other, albeit rather a prototypical than a regularized one. This effect becomes especially visible in the beginning stages of language acquisition and it has been observed repeatedly in linguistic studies. It is precisely this mutual interdependence which the aspect hypothesis is concerned with.

15 In the same way, Jackendoff is able to solve the puzzle of the so-called "imperfective paradox" (Dowty 1979) which deals with the reference to a part of a telic process, but this particular reference does not presuppose that the process will be finished. He argues that these parts behave like unbounded processes pertaining to the function of direction rather than to that of place.

2.2.2. *Aspect Hypothesis*

2.2.2.1. Origin, framework, and evidence

The *aspect hypothesis (AH)* emerged within the framework of temporal semantics and refers to effects observed in early stages of learner language, namely that verbal inflections are complementarily distributed according to the lexical aspectual classes of predicates. The AH dates back to research performed in the late 1980s and early 1990s by Roger Andersen (e.g. 1991). Effects of inherent aspect were first observed in studies on L1 acquisition (e.g. Bronckart & Sinclair 1973, Antinucci & Miller 1976, Bloom et al. 1980, Tomasello 1992, for a comprehensive overview see Rohde 1997) but were, from an early stage onward, also applied to SLA (first reference in Andersen 1986, quoted in Shirai 2002:456).

The early research findings were summarized by Weist et al. (1984) as the so-called *Defective Tense Hypothesis (DTH)*, which claims that the distribution of early verbal inflections depends exclusively on the lexical aspect of the predicate. The term *defective* is used with reference to the fact that the temporal inflections are initially not used according to their tense function in the target language. This absolute interpretation of the observed phenomena with regard to the *exclusivity* of lexical marking was criticized by Weist et al. and others, and rejected in favor of a more moderate interpretation which holds that inflections *predominantly* mark lexical aspect in early interlanguage. This weaker version has variously been called the *Primacy of Aspect Hypothesis* (Robison 1990), *Aspect Hypothesis* (e.g. Andersen & Shirai 1994, Shirai & Andersen 1995, Bardovi-Harlig 1994), *Primacy of Inherent Aspect* (Housen 1995) or *Lexical Aspect Hypothesis* (Rohde 1997). Although a reference to inherent or lexical aspect is warranted in the title to avoid confusion with viewpoint aspect (Rohde 1997:31), I will use the term *Aspect Hypothesis (AH)* as it is the one which has prevailed in recent research. The three basic claims of the AH can be summarized as follows (Shirai 1991, Andersen & Shirai 1996):

1. Learners first use (perfective) past marking on achievements and accomplishments, eventually extending use to activities and statives.
2. In languages that encode the perfective/imperfective distinction, imperfective past appears later than perfective past, and imperfect past marking begins with statives, extending next to activities, then to accomplishments, and finally to achievements.
3. In languages that have progressive aspect, progressive marking begins with activities, then extends to accomplishments and achievements.
4. Progressive markings are not incorrectly overextended to statives.

   (quoted in Bardovi-Harlig 2000:227)

As becomes obvious in this description, aspectual effects can be observed in learner data as a function of time. In line with this condition, Robison (1990:330) points out that "verbal morphology correlates with lexical aspect at least during some stage in the development of IL." Evidence of the development of aspectual marking over time (cf.

Table 2.4) is summarized in Ahmadi (2008:147, the two past inflections, regular past V-ed and irregular past V-irreg, are subsumed under one category V-past in most studies, cf. Bardovi-Harlig 2000). Ahmadi cautions, though, that the developmental sequence is less well accounted for in studies in the AH than the general aspectual effects (cf. also Shirai 2004).

Inflection	Aktionsart
V-ing	**ACT ⇨ ACC/ACH ⇨ (STA)** (V-ing spreads only to some states)
V-past	**ACH ⇨ ACC ⇨ ACT ⇨ STA**
V-s	**STA ⇨ ACT ⇨ ACC/ACH**

Table 2.4: Spread of verbal inflections to lexical categories over time

The aspectual use of V-s with STA is a more recent discovery (Robison 1995, Bardovi-Harlig & Reynolds 1995, Bardovi-Harlig & Bergström 1996). It was not part of Andersen & Shirai's (1994, and other sources) predictions. But corpora such as those analyzed by Rohde (1996, 1997, 2002a,b) show a strong correlation between V-s and states (Figure 2.2, STA are marked in black).

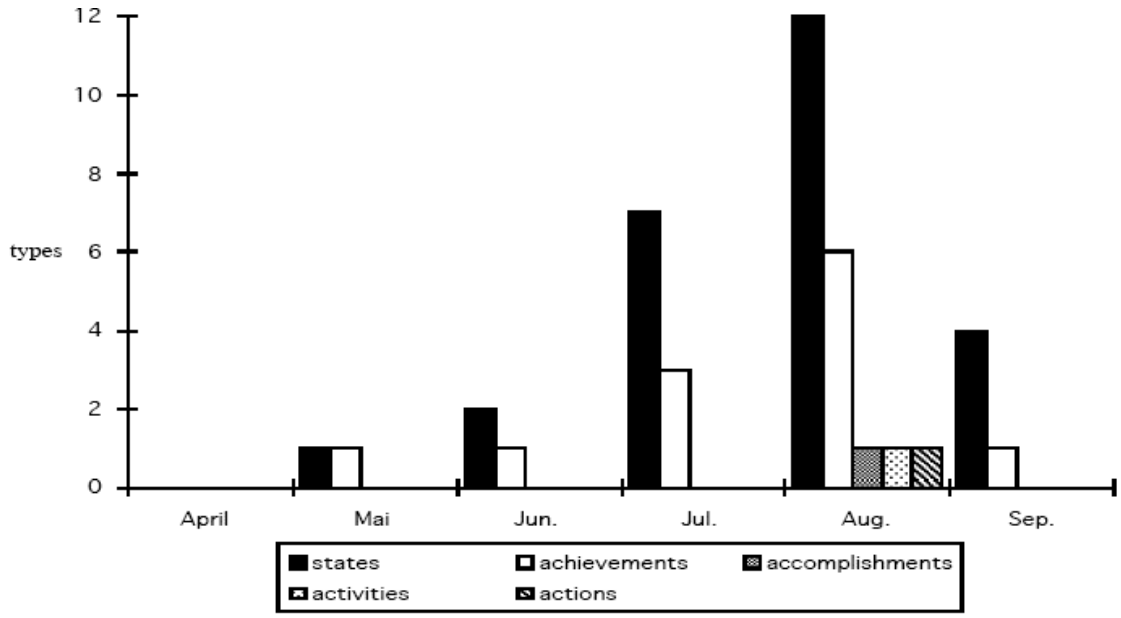

Abb. 33 - Die Bindung der -*s*-Flexion an die Aktionsart des Verbs - Heiko

Figure 2.2: Predominant use of V-s in the category of STA in the data of one child in Rohde's corpus (1997:185)

Rohde admits that this relation might be unexpected because V-s does not carry any temporal/semantic information in itself (the temporal reference of V-s to the present only evolves from the fact that the other grammatical persons are not marked in the present tense at all). Nevertheless, he provides a very plausible explanation:

> *States* sind mit der *progressive form* inkompatibel und treten im Input in der Regel nicht *-ing*-flektiert auf ... In präsentischen Kontexten sind *states* daher (sofern 3. Person-Referenz vorliegt) grundsätzlich *-s*-flektiert, während dies bei dynamischen Verben nur dann der Fall ist, wenn *habitual*, *state* oder *instantaneous present* vorliegt, ansonsten erscheint das Verb im Input gewöhnlich in der *progressive form* (vgl. Kap. 4.1). Es ist deshalb nicht verwunderlich, daß die Flexion zuerst mit *states* wie *want*, *like*, *taste*, *need*, *know*, *look* etc. auftritt – diese Verben werden gewöhnlich nicht *-ing*-flektiert. (Rohde 1997:206)

Housen's (1995:157, his Table 4.3) illustration summarizes the development of perfective and imperfective inflections, which is depicted in Table 2.4:

	Diffusion of Imperfective marker				**Diffusion of Preterit/ Perfect/ Perfective marker**				**Integrated picture**			
	STAT	ACT	ACC	ACH	STAT	ACT	ACC	ACH	STAT	ACT	ACC	ACH
1	-	-	-	-	-	-	-	-	-	-	-	-
2	I	-	-	-	-	-	-	P	I	-	-	P
3	I	I	-	-	-	-	P	P	I	I	P	P
4	I	I	I	-	-	P	P	P	I	I/P	I/P	P
5	I	I	I	I	P	P	P	P	I/P	I/P	I/P	I/P

Based on Andersen1991)

Table 2.5: Staged spread of verbal morphology (imperfective marker I and perfective/perfect marker P) across lexical categories over time (taken from Housen 1995:157).

He explains this phenomenon as follows:

> The I and P morphemes do not become functionally operational as markers of respectively imperfective viewpoint aspect and past tense until they have completed their course across the semantic matrix and have freed themselves from the semantic restrictions stemming from the inherent aspectual properties of the predicate with which they appear. Table 4.3. presents an idealized picture. The actual findings are neither so homogeneous nor absolute. … Table 4.3. also ignores the fact that I and P markers need not appear at the same stage of development. (Housen 1995:157)

Several researchers underline that with increasing proficiency, learners tend to move from lexical marking to grammatical marking (e.g. Robison 1995, Bardovi-Harlig & Reynolds 1995). This explains the fact that at the end of the (idealized) development depicted in Table 2.5, ACH are observed to be used with the imperfective marker and STA and ACT with the perfective marker, a combination not predicted by the AH, which nevertheless becomes necessary in some less frequent grammatical target contexts.

As a matter of fact, it is difficult to tease apart both functions in a research setup. It is methodologically impossible to claim that the use of V-ed with ACH does *not* indicate tense in addition to lexical aspect just because it is used early in the acquisition process. The learner's IL hypotheses are, in a productive process of acquisition, constantly reorganized and tested against the input. Even if there is a point in time at which the learner's hypotheses about the target language link the function of inflections to the lexical category of the verb exclusively, it will be impossible to "prove" this hypothesis in cases where the prototypical features of grammatical and lexical aspect overlap. This is the case for any kind of evidence drawn from a temporal linguistic context: in a present tense context, it is impossible to make a claim about exclusive aspect marking of V-s, and in past target contexts the same holds true for the past inflections. It is only possible to statistically infer the frequency of lexical aspect marking in non-target-like contexts. However, caution must be taken with the interpretation that such frequency effects are valid to "prove" the AH. Popper (1959, 1963, 1972) convincingly demonstrated that a hypothesis can solely be *falsified* by empirical data and that the final conclusion about the applicability of a hypothesis remains a matter of statistical probability. In empirical contexts, in which it seems impossible to tease apart the variables under scrutiny (in this case aspectual vs. grammatical marking) because the linguistics context cannot be applied in a mutually exclusive way, this methodological constraint applies even more. As a matter of fact, this is another theoretical reason for the rejection of the strong interpretation of the *Defective Tense Hypothesis*.

During the last three decades, extensive research has been carried out on various L1-L2 combinations in the framework of lexical aspect, which predominantly found evidence in favor of the (weaker interpretation of the) AH across many different languages including English, German, Japanese, Chinese, Korean, Russian, Spanish, Portuguese and Dutch (for extensive overviews see Ahmadi 2008:79ff, Shirai 2004, Bardovi-Harlig 2000).

2.2.2.2. Explanatory framework

Researchers who have observed these effects have repeatedly attempted to find theoretical explanations for the variable distribution of verbal morphology. The explanations relevant to this study will be summarized in this section. However, a word of caution is in order beforehand. In the analysis of learner language, it is very important to differentiate between the *descriptive level* relating to *a phenomenon observed in interlanguage*, and the *explanatory level* relating to supposed *learner hypotheses* about the target language. Both levels encounter methodological challenges in the actual analysis. The descriptive level of interlanguage output undergoes "several iterations of symbolization (recording, transcription, listing, structural analysis, developmental sequence)" in data analysis (Schumann 1984), during which multi-sensory information is condensed according to the interpretation of the researcher, who is furthermore guided by theoretical frameworks and definitions. The explanatory level for the distributional

bias in learner language is even more difficult to capture, since no direct access to a learner's interlanguage hypothesis is possible. Naturally, such considerations, which will be discussed more extensively in sections 2.4 and 3.2.2 with respect to the so-called *comparative fallacy* (Bley-Vroman 1983), have an effect on the interpretability of linguistic data and should be borne in mind when different explanations are compared.

The range of explanations for the distributional bias of verbal inflections depends on the theoretical framework within which the studies were conducted. Broadly speaking, they tend to come from three different explanatory angles: firstly, the observed effects are defined as linguistic or cognitive universals, secondly, they are related to input frequency, and thirdly to functional approaches (Bardovi-Harlig 2000:413, cf. also Li & Shirai 2000).

The Language Bioprogram Hypothesis

An early example of an innateness theory is found in Bickerton's (1981) *Language Bioprogram Hypothesis*. His research is based on studies in different Creole languages which were found to contain similar structures, in spite of the fact that they seem to be unrelated to each other and developed from different sources. Creoles are developed from pidgin sources by speakers of a generation following the introduction of the pidgin in a specific region. It was considered striking that the developing grammatical structures resemble each other even in Creoles which are not in the least related. Therefore, Bickerton claims that certain linguistic universals have to be innate to the speakers' bioprogram and guide them in the construction of very specific grammatical features of their new language. Bickerton regards the distinction between states and processes as well as between +punctual and –punctual as linguistic universals.

The Aspectual Semantic Transfer Hypothesis

In a very recent approach, Ahmadi (2008) put forward the notion of semantic transfer from the L1 in her *Aspectual Semantic Transfer Hypothesis* (ASTH). Her explanatory approach is mainly based on Slobin's *Language Transfer Hypothesis* (1991, cf. also 1997) and Odlin's (2005) *conceptual transfer*. According to Ahmadi, it is the lexical aspect of the respective L1 predicate which most influences the distribution of verbal inflections, and not, as assumed in most studies, the lexical category of the same predicate in the L2 (Ahmadi 2008:303, cf. also Shirai & Nishi 2002, Nishi & Shirai 2007). In her study of adult Persian learners of English she shows that the same lexemes may be conceptualized with different semantic features by native speakers of different languages. The lexicalization of the verb *show*, for instance, is equivalent in Persian and English, but the Persian lexeme entails telicity in a native speaker's intuition, while the English one does not (p. 305). According to the ASTH, the L1 notion about each predicate is transferred to the L2 equivalents by the learner in the early

stages of acquisition, and the L2 predicates are inflected according to the notions derived from the L1.

In the following, Ahmadi carries out an exemplary study on those verbs in her corpus which were coded differently in the L1 and in the L2. It has to be remarked, however, that only fourteen out of over 250 verb types received different coding in her study, and that the results remain inconclusive with respect to the predictions of the AH, although Ahmadi found a slight effect on the developmental sequence of inflectional marking. It is also questionable whether the effect would be relevant for two languages as closely related as German and English in the present study.

In conclusion, while the reasoning behind the ASTH intuitively seems convincing, more evidence is needed to find out whether the hypothesis indeed makes tenable predictions about learner language. At the current state of analysis, the results seem to be more supportive of nativist or universalist positions than of L1 transfer mechanisms.

Such findings would actually corroborate hypotheses which date back to the 1970s. As early as 1976, Wode suggested that L1 transfer only occurs in certain stages of L2 development, which exhibit certain similarities to the L1 (see also Wode 1978, 1980, and for a recent approach to the topic Pienemann et al. 2005).

The Distributional Bias Hypothesis

Andersen (1990, 1993), on the other hand, highlights the fact that adult native speakers of a language exhibit a similar, though less frequent bias of inflectional distribution to the one observed in learner language. In his *Distributional Bias Hypothesis* he argues that the strong effects found in the language of learners rely on the overgeneralization of a rule which the learners observe in the input of the target language.

> There are ... properties of the input that promote the incorporation of an inappropriate form:meaning relationship into the interlanguage. That is, the learner misperceives the meaning and distribution of a particular form that he discovers in the input, following the Distributional Bias Principle: If both X and Y can occur in the same environments A and B, but a bias in the distribution of X and Y makes it appear that X only occurs in environments A and Y only occurs in environment B, when you acquire X and Y, restrict X to environment A and Y to environment B. (Andersen 1990:58, quoted in Andersen & Shirai 1994:138)

This claim is supported, among others, by data quoted in Andersen & Shirai (1994) and Shirai & Andersen (1995).

Salience

As yet another explanation, Shirai & Kurono (1998) have put forward the notion of *phonological salience* (cf. also Klein et al. 2003), especially with regard to the syllabic nature of V-ing. Whether perceptual salience in the form of syllabic versus non-

syllabic phonological forms is a factor which influences lexical aspect marking remains to be proven, as the evidence in Klein et al.'s study remains inconclusive with regard to the AH. It might however be one of the valid explanations for the findings for Group 1 in the present data set with regard to V-ing, which seems to be used as a default marker on all aspectual categories except for STA (cf. section 5).

Andersen (1993) and Andersen & Shirai (1994) propose four additional cognitive principles which according to them can account for the skewed distribution of verbal inflections, the *Relevance Principle*, the *Congruence Principle*, the *Redundant Marking Hypothesis*, and *Prototype Theory*.

The Relevance Principle

The *Relevance Principle* is based on research by Bybee (1985) and Slobin (1985) and claims that the acquisition of morphemes is guided by their relevance for the meaning of the respective verb. They claim that aspect is more relevant for verb meaning than tense, mood, or congruence, and thus is acquired prior to the other functions. Rohde (1997) criticizes that the alleged higher relevance of aspect over tense is not intuitively justifiable. He raises the question of why lexical aspectual information, which is already present in the semantics of the predicate, should be redundantly marked if the non-redundant information on tense remains unmarked.

The Congruence Principle

The second principle is the *Congruence Principle* (Andersen 1993) according to which inflections are attached to verbs which share the most semantic features with them, i.e. whose aspectual meaning is *congruent* with that of the inflection. The *Congruence Principle* was later adapted and reformulated by Shirai as the *Redundant Marking Hypothesis* (1993, 1995, Shirai & Kurono 1998) and by Giacalone Ramat (1995) as the *Principle of Selective Association*. One could argue, however, that this principle is nothing but a reformulation of the prototype explanation, i.e. the fourth principle, which stems from a much larger framework (see below) and thus remains somewhat redundant in the account of cognitive operational principles which shall serve to explain the inflectional distribution.

The One to One Principle

The *One to One Principle* suggested by Andersen (1994, cf. also *Principle of Selective Association*, Giacalone Ramat 1995) claims that a newly acquired inflection tends to contain just one single function in the learner's cognition. In this way, prototypical assumptions about the function of an inflection are reinforced, and it will be distributed characteristically only according to this single function. Here, Andersen & Shirai

(1994) mention telicity for the past inflection, and ongoing activity for V-ing. Although Rohde's (1997) data did not confirm this assumption (the distribution of V-ing showed different functions at all times in his data corpus), a later study of his on second language acquisition of very young learners (Rohde 2005) sheds an interesting light on this principle. According to cognitive theories on the acquisition of the lexicon, specific operating lexical principles are responsible for restricting possible hypotheses about function and meaning of newly acquired lexical items. One such principle which has been identified in the research of Markman (e.g. 1989, 1994), is called the *Mutual Exclusivity Assumption*. This principle states that children accept just one single meaning for one referent, and that the meanings of two different words are mutually exclusive, i.e. they cannot refer to the same referent at the same time. Rohde (2005) found strong disambiguation effects within the framework of this hypothesis for both early L1 and L2 acquisition. If we assume that this cognitive principle applies generally in language processing and is not restricted to the lexicon only, I would suggest subsuming the *One to One Principle* for the skewed distribution of verbal inflections under the more general cognitive principle of *Mutual Exclusivity*.

The Prototype Principle

The fourth operating principle used by Andersen and Shirai to explain aspectual effects in learner language is the most powerful explanatory approach (cf. also Li & Shirai 2000). *Prototype Theory* is a theoretical approach which emerged in the field of cognitive psychology and dates back to very influential studies by Eleanor Rosch and her collaborators in the early 1970s (e.g. Rosch 1973, Rosch & Mervis 1975). Prototype Theory is concerned with conceptual categories, which are said to give an elementary structure to human thought and language. The early sources of Rosch's research date back as far as Ludwig Wittgenstein, who coined the term *family resemblances* for a phenomenon he observed in specific kinds of mental categories. The members of these categories do not all share the same semantic features but are rather connected by a "chain" of shared features which connect a category member to its nearest neighbors, but not necessarily to all other members of the same category. The most famous example is his reasoning about the category of *game* in his *Philosophical Investigations* (1953). Other sources were John Austin's (1961) *Philosophical Papers* and the work by Berlin & Kay (1969) on color categories and by Roger Brown (1958, 1965) on basic-level categories (for an extensive overview to the historical development and further advancement of the theory of conceptual categories cf. Lakoff 1987). Rosch's suggestions are seen as the most influential ones, as she

> saw the generalizations behind such studies of particular cases and proposed that thought in general is organized in terms of prototypes and basic-level structures. It was Rosch who saw categorization itself as one of the most important issues in cognition. Together with Carolyn Mervis and other co-workers, Rosch established research paradigms in cognitive psychology for demonstrating centrality, family resemblance, basic-level categorization, basic-level primacy, and reference-point reasoning, as well as cer-

> tain kinds of embodiment. Rosch is perhaps best known for developing experimental paradigms for determining subjects' ratings of how good an example of a category a member is judged to be. (Lakoff 1987:15)

Classical theories on categorization did not differentiate between different members of a category. All members were regarded as identical in status with respect to their category. Rosch's experiments revolutionized this kind of thinking. In numerous empirical studies, her subjects demonstrated categorization effects which showed a clear asymmetrical gradation between different members of a category which they classified as "better" and "worse" examples of the category in question. These asymmetries were termed *prototype effects*, and the best member of each category, i.e. the one picked most often by the informants to represent the category, was called the *prototype*. All category prototypes subsume the greatest number of those semantic features which are typical or defining for a given category. Two well-known examples are the preference for focal colors over non-focal colors, and the robin as a prototype for the category BIRD.

In her later work (e.g. 1978) Rosch underlined the danger of misinterpreting Prototype Theory as a model of mental processing: Classification according to prototypical category members is revealed in empirical studies on the informants' *behavior* regarding the categorization of concepts. However, neither does it supply, nor has it ever been claimed to give any insight about the actual underlying neurological processes which account for this kind of observed behavior. Rosch cautions that prototypical judgments may indeed express some notions of an underlying mental representation, but they are not sufficient for its definition. Above all, the prototypical *object* selected by a number of subjects for a category must not be confounded with its *mental representation*. This means that although the robin may be picked by a specific group of speakers as the most prototypical exemplar of the category BIRD, that does not mean that a pictorial representation of a robin actually underlies their mental concept; rather, it is simply an expression of the fact that a robin seems to incorporate the most prototypical features connected with the mental category BIRD. In that sense, it is important to keep in mind that prototypes represent an *effect* rather than explaining the *cause* of conceptual categorization. On the other hand, processing models should be able to account for empirically observed prototype effects which demonstrate a certain constraint on its mental processing, even if they are not the source of the mental representation. A processing model should therefore be in line with predictions of prototypical effects expressed via processing load and processing time for better or worse examples of a category.

Rosch's psychological studies were rapidly applied to linguistic research, especially lexical semantics and morphology (e.g. by Bowerman 1978, Barrett 1982, 1986, Greenberg & Kuczaj 1982, Slobin 1981, 1985, Sachs 1983, Taylor 1989, Kellermann 1978 for SLA). Based on this work, Andersen and Shirai propose prototype effects as another possible explanation for the distribution of verbal inflections (cf. Andersen 1991, Shirai 1991, Andersen & Shirai 1994, Shirai 2002):

> Applied to language acquisition, the claim is that children acquire a linguistic category starting with the prototype of the category, and later expand its application to less prototypical cases. (Shirai & Andersen 1995:758)

For the aspectual categories of the AH this means that inflections are predominantly used with those categories whose prototypical features most strongly correspond with those of a verbal category. Specifically, it means that the prototypical features of the past inflection -ed, i.e. +punctual, +telic, +result, are best matched by those of ACH verbs, which include +punctual, +telic, +result, as well.[16] This is assumed to be the reason for the early preference of ACH marking with -ed in the framework of the prototype account. The same holds true for the prototypical features of -ing, which match those of ACT verbs, i.e. –telic, –punctual [+durative], both denoting *action in progress* (Shirai 2002). ACC, on the other hand, are positioned in between these categories, in that they contain features from both categories: they are both durative *and* telic. This renders ACC a less prototypical member for the progressive inflection. For this reason, according to Shirai (2002), the progressive meaning is used later with ACC than with ACT.

As becomes obvious in these examples, the matching of semantic features in this approach comes very close to the mechanism of congruent marking put forward in the *Congruence Principle* as quoted above. Assumably, the congruence effect observed in this principle is therefore nothing but a specific manifestation of the overall prototype effect. I consider *Prototype Theory* the most powerful explanatory framework for the effects under scrutiny in this analysis, especially when combined with an underlying neurological model which can account for the psychological reality of the observed effect (cf. section 2.2.2.2). If used to account for verbal distribution in learner language, some clarification is necessary, however, with regard to its terminological usage and the form-function dilemma of verbal inflections. Section 2.2.2.3 will discuss these issues in more detail on the basis of a very influential study on the AH. But first, the connectionist model will be described, which discusses possible underlying neurological processes of the mental representation of prototypes.

The Connectionist Model

The connectionist model (Li & Shirai 2000) is based on a model of the neural processing of information in the human brain, combining the representation of stored information and the learning of new information through a network of connected processing units. Claiming to represent psycho-biological reality, the computational network forms and reinforces connections between connected units ("neurons") through repeated activation, thus forming characteristic activation patterns connected to a specific kind of information, a process which is characteristic for information processing

16 Shirai & Andersen (1995) found that in the very early stages of acquisition, telicity seems more important as a guiding feature than punctuality.

and storage in the human brain. The network which models these processes is dynamic in the sense that it is able to take in and store new information in newly created activation patterns which underlie constant changes according to new input activation.

The authors differentiate between their connectionist approach and traditional approaches which rely on symbolic and rule-based explanations. The biological reality of their model, which is based on mechanisms of neural processing in the human brain, is the most important predictor, as

> the notions of multiple processing units, activation, excitation, inhibition, and connection strengths provide us with more neurally plausible constructs for conceptualizing information processing than do discrete symbols, rules and abstract categories. (Li & Shirai 2000:150)

In contrast to the complex interaction of various layers within a connectionist network, symbolic theories are claimed to be modular and often more linear and thus less capable of capturing the interactive nature of human information processing.

According to the authors, such connectionist networks present a potent explanation for patterns and processes observed in the acquisition of linguistic systems:

> With regard to language, advocates of connectionism argue that linguistic representations (of the lexicon, morphology, and grammar) are "emergent properties" due to the interaction of the learning system with the linguistic environment. Through detecting regularities in the form-meaning mapping process, connectionist networks demonstrate capabilities in inducing syntactic and semantic structures from the learning environment. This view contrasts with the symbolic view that often emphasizes the psychological reality of linguistic rules and the representational innateness for the *a priori* status of some grammatical and semantic categories. The concept of emergent property is crucial in connectionist theory. (Li & Shirai 2000:150)

Li & Shirai go on to illustrate these two diverging approaches with the acquisition of the regular past inflection in English, a form which has been the subject of some theoretical discussion between the two schools before. While representatives of the symbolic view (e.g. Pinker 1991, 1999) hold that forms such as *blowed* and *breaked* are instances of overgeneralization of an internalized linguistic rule the exceptions of which have not yet been fully acquired, connectionists such as Rumelhart & McClelland (1986) argue for a single connectionist learning mechanism which is applied equally to both the regular and the irregular verb forms. "According to this view, overregularization errors thus reflect the child's ability to extract statistical regularities in the input and the ability to use the extracted patterns productively" (p. 151), which means that *blowed* could be regularized according to the frequent pattern recognized in *flowed, glowed, slowed*, etc.

The authors assume that the marking of lexical aspect in learner language emerges in a similar way. The connectionist network processes information in a probabilistic way, induced by the frequency of co-occurrences of structures in the input with specific categories or concepts:

> The implication of this feature-based account of lexical aspect of verbs is that for the child, then, the learning of grammatical morphemes like *-ing* or *-ed* is not simply the

> learning of a rule, but the accumulation of the connection strengths between *-ing* or *-ed* and a set of weighted features shared by the verbs. At the same time, the child also develops a feature-based organization of verb categories. Within this scenario, the learning process is best described as a correlational, statistical procedure in which the learner implicitly tallies and registers the frequency of co-occurrences (strengthening what goes with what) or the co-occurrence constraints (inhibiting what does not go with what) among morphemes, features, and verbs. (Li & Shirai 2000:155)

In several computational simulations of the language learning process, Li & Shirai found that their connectionist network was able to analyze input features, create association patterns, form lexical aspectual categories on the basis of semantic verb structures and link these to verbal inflections in a characteristic pattern which resembled those of empirical findings in child language. Based on these results, the authors make a strong case for connectionism as a model for lexical aspect marking. Relying on statistical frequency in the input, it is thus a model which might be able to provide a powerful neurological explanation for the prototype effect which has been observed in lexical aspect marking (cf. section 2.2.2.2). Prototypical marking occurs where the connections between lexical aspect and inflections are strongest. In addition, as Li & Shirai point out, their network model also accounts for the eventual violation of prototypical marking as observed when learner language gradually proceeds from prototypical to non-prototypical (but grammatically target-like) marking over time.

2.2.2.3. Coming to terms with the form-function interface in the AH

Terminological issues on form and function of prototypical categories

Rohde (1997, for more accounts on the same data corpus cf. also 1996, 2002a,b) relativizes the applicability of prototype effects with regard to his own findings. He observed the language acquisition process of four children from the beginning of their one-year sojourn in the United States and found a strong correlation of V-ing and future reference:

> Inputdaten amerikanischer Kinder (Kap. 13) weisen zwar darauf hin, daß die **prototypische Funktion der *progressive form* aspektuell** ist. Für die deutschen Kinder hingegen ist die **zukunftsreferentielle Funktion der *progressive form*** mindestens ebensosehr von Bedeutung. (Rohde 1997:93)

> Dennoch ist für die beiden Jungen Lars und Heiko eine strenge Bindung von Flexionselementen an verbinhärenten Aspekt nicht für die gesamte Kontaktdauer zu beobachten, sondern lediglich zu bestimmten Zeitpunkten, die für beide unterschiedlich sind. Diese Unterschiede liegen z.T. darin begründet, daß die ***progressive form* mit verschiedenen Funktionen** auftritt. Bei Heiko beispielsweise tritt diese Struktur mit zukunftsreferentieller Funktion bereits zu Beginn der Kontaktdauer auf, so daß entgegen der Voraussage der AH vorwiegend punktuell/telische Verben *(achievements, actions)* mit dem Flexions-element *-ing* versehen werden und nicht durativ/atelische. **In den bisherigen Erwerbsstudien ist man davon ausgegangen, daß ein Flexionselement jeweils eine klar definierte Funktion hat. Für die *progressive form* nahm man an, ihre prototy-**

> **pische Funktion sei die Aspektmarkierung von Verben**, die im Verlauf begriffene Ereignisse beschreiben. Der Gebrauch der *-ing*-Form von Lars und Heiko zeigt, daß hier eindeutig keine Bindung des Flexionselementes an die durativ/atelischen Verben vorliegt. **Hat ein Flexionsmorphem mehr als eine Funktion, so tritt es auch mit verschiedenen semantischen Verbklassen auf.** Diese Beobachtung schließt zumindest für den L2-Erwerb eine punktuell-durativ-Distinktion im Sinne von Bickertons (1981) PNPD als ein Bestandteil des Bioprogramms aus … **Grundsätzlich scheint davon ausgegangen zu werden, daß dieses Morphem ausschließlich aspektuelle Funktion hat.** Es ist jedoch wahrscheinlich, daß auch im L1-Erwerb das Morphem *-ing* mit Futurfunktion sehr früh in Lernerdaten zu finden ist, so daß auch punktuelle Verben *-ing*-flektiert werden und Bickertons PNPD nicht nachweisbar ist. … Es ist zudem denkbar, daß innerhalb bestimmter Sprechakte die Voraussagen der Aspekthypothese eher zutreffen als innerhalb anderer. So zeigte sich in der Datenanalyse, daß die Kinder in Spielsituationen häufig das gerade Geschehene kommentieren und so der Aspekthypothese entsprechend vorwiegend *achievements* und *actions* mit der Präteritalmarkierung versehen. (Rohde 1997:204f, bold print is mine)

To come to terms better with these conflicting findings, it is necessary to take a closer look at the definition of *prototype effect*, *aspectual effect*, and the concept of *function*. An *aspectual effect*, i.e. the predominant use of a verbal inflection with a lexical category, represents a form of a *prototypical effect*; taxonomically speaking it is a subordinate category, i.e. a specific manifestation of the superordinate *prototype effect*. In this context, it must to be underlined that prototype effects do not pertain exclusively to the aktionsart of the predicate, as Richard Weist (2002) argues with reference to first language acquisition:

> Semantic properties constitute a basic component of prototype theory. Prototype theory places an emphasis on information processing as contrasted with bio-programming. The concept of Aktionsart plays a central role in the prototype account of the acquisition process. However, the prototype concepts that are hypothesized for the child include not only the properties of Aktionsart, e.g., *punctual* or *telic*, but also the properties of grammatical aspect, e.g., *completed* or *ongoing* and the relational properties of tense. The prototypes are Aktionsart-aspect-tense composites. These composites represent concepts that the child will move away from during acquisition rather than representing the corner stones for future development. (Weist 2002:69)

Therefore, a verbal inflection can *function* in very different ways within the linguistic contexts in learner language: a) It may carry a *grammatical function* such as grammatical aspect (cf. section 2.2.1.1). b) It may carry the *conceptual function* of *temporal marking*, or c) it may carry the *conceptual function* of *lexical aspect marking*. (For the differentiation between grammatical and semantic/conceptual function cf. e.g. Tarone 1988, Huddleston 1993, cf. also Housen 2002 for a discussion of the form-function interface in the framework of the AH). In the target language, verbal morphology may indeed express all these different functions at the same time: the -ed carries a perfective grammatical aspect, past reference (temporal conceptual function) as well as telicity. The same may be true for learner language, depending on the respective hypotheses about the target language rules at a specific time in the learner's IL system. And

prototype effects as the basic categorization mechanism of mental concepts can be found in all of the three different functions:

> ASPECT OR TENSE? The prototype account proposed here also resolves the conflicting claims about whether early past morphology encodes aspect or tense. Our view is that it would be difficult to claim one or the other. What children are doing is simply attaching early past inflection to the prototype of the category past (i.e. [+telic], [+punctual], [+result]). The reason children appear to be marking aspect is that the prototypes of past (tense) and perfective (aspect) are very similar. Dahl (1985:78), for example, characterizes the prototypical perfective as referring to a SINGLE PUNCTUAL event that occurred in the PAST, with a clear RESULT or end state. Since the prototype of the category perfective is very similar to that of the category past, it appears as if, in the beginning, children are encoding perfective (grammatical) aspect, or perhaps the inherent aspectual value of telicity/punctuality. Depending on how one looks at the phenomena, two claims become possible: (1) Early past morphology encodes underextended past tense, that is, it is attached only to prototypical past; and (2) Early morphology encodes aspectual features such as completive, perfective, punctual, telic, and so forth. ... Bybee & Dahl (1989), as well as Bybee et al. (1994), also claim that in language change, past tense and perfective morphology often develop out of aspect markers (resultative and perfect); this closely parallels what we observe in language acquisition. Prototypical past-perfective might thus be a cognitive axis for grammaticalization. (Shirai & Andersen 1995:759f)

Accordingly, it has to be borne in mind that the use of one function does not necessarily exclude the applicability of another. Based on this reasoning, the following comments are pertinent to observed variation in the distribution of inflections in learner language in general, and with that to Rohde's findings with respect to the V-ing inflection.

- The fact that V-ing might be used with future reference in the learner data does not necessarily constitute evidence against the AH. The AH only claims that lexical aspect is *predominantly* marked by verbal inflections. It does not claim exclusivity. In that sense, findings such as Rohde's are indeed suitable to refute the strong version of the AH, i.e. the *Defective Tense Hypothesis*, but not the AH itself.
- The second question which arises from these observations is whether the learners indeed *intended* to mark future reference, or if future contexts are simply one kind of linguistic context which occurs in the intra-individual variation of V-ing at a specific point in time. The reasoning behind this is the following: The fact that V-ing is found in future contexts does not necessarily prove that the inflection was used by the learner exactly with this specific function in mind. If the AH posits, for instance, that V-s is used to mark stative lexical aspect, this *does not preclude* that these markings may be found in *present* (as well as in other temporal) *contexts*. The AH only makes the prediction that the *function* of this inflection is predominantly that of lexical aspect marking, and that it does not *mark* present reference. What would shed light on the function of present reference is the *predominant* or *exclusive* use of V-s in present linguistic contexts (cf. the dis-

cussion in the following section). However, in Rohde's example, this does not seem to be the case: in addition to future reference, he reports simultaneous uses of V-ing with present and past reference. In the example of early past reference he specifies that reference to the past is not the intended function the observed tokens contain:

> Im dritten Kontaktmonat treten zwar formal aspektmarkierte Verben auf, wobei hier aber offenbar nicht die *progressive form* mit vergangenheitsreferentieller Funktion intendiert ist. (Rohde 1997:161)

This reasoning shows that it is necessary to establish criteria to identify the contexts in which an inflection is used *predominantly* at a specific stage of development, if one wants to determine its function. The following section will discuss this issue in more detail.

Validity criteria of functional analyses

Kersten (2009a), based on Pallotti (2003, 2007), emphasizes that in order to establish the function of an inflection in learner language which includes a high amount of variability, it is essential to carry out a careful distributional analysis which is suitable to exclude the use of chunks and random variation (Table 2.6). These criteria have been developed within the framework of *Processability Theory* (PT, Pienemann 1998, 2005) in order to analyze the *emergence* of a linguistic structure in the learner's IL in contrast to other criteria of acquisition (cf. section 2.1.3). It can be argued, however, that it is beneficial to use a comparable procedure to approach the form-function discussion in the present framework as well.

threat to validity	**criterion**
exclusion of insufficient evidence	→ number of contexts
exclusion of chunks	→ variability
exclusion of random hits	→ overuse

Table 2.6: Validity criteria for variation in learner language (taken from Kersten 2009a:283)

Table 2.6 shows that there are several factors with the potential to undermine the validity of an inflectional analysis. The first factor to account for is insufficient evidence: the criteria have to include a sufficiently high number of linguistic contexts for each structure. Pienemann (1998) concedes that

> some degree of ambiguity remains in this analysis when it comes to judging if the number of linguistic contexts is sufficient for a given rule to decide if the rule has been applied or not. (1998:146)

Therefore, the number of linguistic contexts used for a distributional analysis has to be considered carefully.

Secondly, the researcher has to guarantee the exclusion of formulaic chunks. A valid indicator for this is a certain degree of lexical variability in the data. It can be

argued that this is a necessary prerequisite not only for morphological analyses but for syntactic structures as well, because in this case, the risk is particularly high that some structures used frequently have been learned as formulas (Pienemann 1998:147).

The final and most important threat to the validity of a distributional analysis is the occurrence of random hits (Pienemann 1998). Pallotti (2003, 2007) argues that these can be accounted for by the number of over-suppliances or over-use of the respective structure. In his opinion,[17] the rate of over-suppliances as inferred from the matrix for a distributional analysis in Pienemann (1998:158) is the crucial factor for the exclusion of random hits. Table 2.7 illustrates this in a hypothetical example of a distributional analysis:

Plural -s	**pl**	**sg**
N+ -s	8	2
N+ -ø	15	43

→ token number of -s 10, number of over-suppliances 2 = 20 %

↓ token number of pl 23, number of under-suppliances 15

Table 2.7: Hypothetical example of a distributional analysis of plural -s (adapted from Kersten 2009a:284)

Table 2.7 shows the (hypothetical) number of over- and under-suppliances of the plural -s inflection in a learner transcript. Under-suppliance, which is represented in the columns, is a very common phenomenon in interlanguage, which has to be expected for each linguistic form which is in the process of being acquired. According to Pallotti, under-suppliance cannot be counted as the defining factor for the acquisitional emergence: if an inflection occurs 8 times correctly (and preferably with different types indicating variability), there is probably no difference in the status of its *emergence* in the interlanguage system, independent of whether there are 15 or 50 under-uses. The number of under-uses simply specifies a more or less well-established application of the rule. This is different, however, when it comes to the number of over-suppliances: had there been 12 over-suppliances instead of two, the number of over-suppliances would outweigh the number of target-like uses 60% to 40%, and at that moment the distribution of N-s can only be judged as highly random. According to this logic, the percentage of over-suppliance has to be taken as an indicator for randomness.

Obviously, even in such a fine-grained functional analysis the cut-off points for the "acceptable" percentage of over-suppliance and of other indicators remains arbitrary to some extent. It is also true that different kinds of analyses may call for different acquisitional criteria, to which the distributional analysis has to be adapted. It must be emphasized, though, that in order to make a claim about the intended function of an inflection in learner data it is essential to operationalize the analytical criteria with regard to the linguistic contexts in which the inflection is used throughout the sample.

Kersten (2004, 2009a) provides an example for such an operationalization, which was applied to data of four children from the present data corpus, i.e. the girls 03, 06,

17 (personal communication)

07, and 08, in the framework of PT. Although the present study follows a different approach, the analytical tools used in the PT analysis are helpful for the current discussion of the form-function interface of the inflectional distribution. In addition, the results are suitable to illustrate the acquisitional development of the children in this study from a different (i.e. form-focused) angle. For the PT study, the following cut-off points were established for the criterion of over-use (Table 2.8):

Over-suppliance

	target-like + overuse	=100 %
+	target-like	≥ 75 %
(+)	target-like	≥ 50 %
(–)	target-like	≥ 25 %
–	target-like	< 25 %

Table 2.8: Percentages of over-suppliances and their status of *emergence* (adapted from Kersten 2009a:284)

The chart in Table 2.9 shows the operational criteria of the four variables *context*, *under-use*, *over-use*, and *variability* with illustrating examples from the data of the four children.

S	Structure	Con-texts	Under -use	Over -use	Variability (Types)	Examples from the Data / Comments
6	cancel inv	?	inv	/	?	he wants to know where the frog is he looks where the frog is = fused rel he sees in the glass where the frog is = rel
5	aux/do 2nd	≥4	context ¬inv	/	≥4 or 3 incl. 1mp (types of wh+aux)	mp: where are you looking? / where is my frog going?
	3.sg –s	≥5	3.sg¬s	s¬3.sg	≥5 or 3 + 1mp/creat	exclusion of *be/have* mp: he walks / they walk creat: past irreg+s
4	wh-cop inv	≥4	context ¬inv	/	≥4 or 3 incl. 1mp (types of wh+V)	mp: where are you? / where is my frog?
	yes-no inv	≥3	context ¬inv	inv¬ context	≥3 or 2 incl. 1mp (types of S+V)	overuse: this can you have mp: are you here? / is he here?
	part-verb	≥3	context ¬movemt.	/	≥3 or 1 + 1creat (different verbs)	creat: the dog came the beehive down (mp ?)
3	topical	≥3	/	/	≥3 (diff. elements)	objects and subordinate clauses (mp ?)
	do-front	≥4	context¬ do-front	do-front ¬context	≥4 (do with diff. contexts)	underuse: he go there?
	wh-front	≥4	Ntl posit. within S, (not final)	/	≥4 or 3 incl. 1mp (types of wh+V)	underuse: he where is? mp: where are you? / where is my frog?

	adv-front	≥3	Ntl position within S, (not final)	/	≥3 or 2 + 1mp or 1 + 1 creat (types of adverbs)	exclusion: clause-linking conj and then; there is underuse: the frog in the night go to his family mp: now the boy wake up/now the frog is away creat: downside, there are a lake
	(*)aux+en	≥5 of aux+en	*aux+en en¬aux	aux¬en (= +Vø]	≥5 or 3 + 1 creat	underuse: is fallen/falled/fell, gone creat: have goed = aux+*en
	(*)aux+ing	≥5 of aux+ing	IL-ing	aux ¬ing	≥5 or 3 + 1 creat	aux past + aux present creat: are *ruf*ing = aux+ L1-ing *ist* looking = L1-aux+ing
	poss.	≥5	context ¬ poss	poss ¬ context	≥2	his dog underuse: put he hands on he nose
	obj.pro	≥5	context ¬ obj.pro	obj.pro ¬ context	≥2	exclusion of 2nd sg., he see them underuse: he see they
2	SVO	≥4	SOV/VSO random distrib.	/	≥4 (with varying constit.)	
	neg+V	≥3	postverb. neg?	/	≥3 or 1 + 1 creat (types of V with neg.)	the boy (is) not walking / don't walk underuse: he looks not? creat: don't can come/don't finds/didn't were
	past irreg	≥5 of V-past	*past-ed irreg+ed irreg+s	(X-irreg)	≥5 or 3 + 1 creat	exclusion of *be/have* creat: *full=fell = *irreg
	past reg	≥5 of V-past	/ (V-reg +irreg)	(X-ed)	≥5 or 3 + 1 creat	creat: comed = *past-ed camed = irreg+ed
	IL-ing	≥5of (aux+) V-ing	/	(X-ing)	≥5 or 3 + 1 creat	creat: the boy *ruf*ing = L1-ing
	plural –s	≥5	pl¬s	s¬pl	≥5 or 3 + 1mp/creat	mp: frog / frogs creat: childs, childrens
1	single wds	≥2	/	/	/	dog, boy, *der* frog

S Stage; (X) unlikely to occur; ntl non-target-like; ¬ without; / no evidence in the data or not possible; mp minimal pair; creat creative construction

Table 2.9: Operational criteria for a functional distributional analysis (adapted from Kersten 2009a:284ff)

The following table (Table 2.10) illustrates how these criteria can be applied to the data. It shows the distributional analysis of the picture story narrative which Child 06 told in third grade. The focus of the morpho-syntactic analysis is the use of those linguistic structures which are assigned to specific stages in the processing hierarchy according to the predictions of PT (for a detailed discussion of the criteria cf. Kersten 2009a).

Structure	Random hits				Variability				(Negative evidence)				Status:
	tl tokens	over-u (/cont)	%	stat. (≥75%)	tl types	min. pairs	creat. constr.	stat.	contexts	stat.	under -use	stat.	emerged
morphol.													
pl. –s	15	0	100	+	6	2	1	+	15		0		+
IL-ing				/				/					/
p. reg	5	0	100	+	4			–	5		0		(+)
p. irreg	4	0	100	(+)	2		1	(+)	6		2		(+)
poss	12	0	100	+	2			+	12		0		+
obj.pro	5	0	100	+	1			–	5		0		(+)
aux+ing	6	0	100	+	6			+	6		0		+
aux+en	1	2	33	(–)	1			–	6	+	3	+	(–)
3.sg –s	44	1/11	98	+	16	5	1	+	56		12		+
syntax													
SVO	59			+				/	59		0		+
neg+V	4			+	4			+					+
adv-front	3			+	3			+					+
wh-front	7			+	2	1		–	7		0		(+)
do-front				/				/					/
topical.	4			+	4			+					+
part-V move	1			(+)	1			–					(+)
yes/no inv				/				/					/
wh-cop inv	7			+	2	1		–	7		0		(+)
aux/do 2nd				/				/					/
cancel inv				/				/					/

+: emerged; (+): insufficient evidence for emergence; (–): insufficient evidence against emergence;
–: not emerged; tl: target-like

Table 2.10: Application of the operational criteria for the status *emerged* to the data of Child 06.3 (adapted from Kersten 2009a:287)

It should be pointed out that PT only makes predictions about the emergence of *grammatical* functions. Thus, the analysis does not give any information about temporal or aspectual use. The examples are supposed to illustrate one form of distributional analysis which can be used to establish a specific functional use of a form in learner language. Nevertheless, I argue that it is crucial to carry out an operational analysis of this kind, which has to be adapted to the specific purpose, in order to make claims about the function of an inflection in a learner sample, whether grammatical or conceptual. Only with the help of an analysis which takes all linguistic contexts and the under- and over-use of a feature into account can its *predominant use* be established, serving as an indicator for both its grammatical and its conceptual function

However, from the perspective of the present study, the results of the comparative PT study reveal an interesting picture with regard to the emergence of the linguistic structures in our corpus in general. While IL-ing (the bare V-ing without auxiliary) is present in all narratives from the very beginning (located at Stage 2), the analysis reveals that the aux+ing construction (located at Stage 3) appears only in grade 2 for the Children 03, 07, and 08. The data of Child 06 is revealing as she is the only child of the four who had prior experience with the L2 in a bilingual preschool. Here, the advantage is visible in the use of a more complex grammatical structure from the very beginning of the tests. Simultaneously, all of the children have already acquired the

grammatical use of the V-s inflection (Stage 5) in grade 2 (Table 2.11). Stage 5 explicitly measures the target-like grammatical agreement between the subject and the verb.

Stage	03.1	03.2	03.3	03.4	06.1	06.2	06.3	06.4	07.1	07.2	07.3	07.4	08.1	08.2	08.3	08.4
6								+			(+)	(+)		(+)	+	**+**
5		+	+	**+**	(+)	+	+	+		+	**+**	**+**	–	+	+	+
4		(+)	(+)	(+)	(+)	+	**+**	+	(–)	+	**+**	**+**		(+)	+	**+**
3	(+)	+	+	+	+	+	+	+	+	+	+	+	+	**+**	+	+
2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1	/	/	/	/	/	/	/	/	+	/	/	/	/	/	/	/

bold +: structure provides not enough contexts in that data set but has been mastered in previous years

Table 2.11: Attainment in development (Tests A+B) of Children 03, 06, 07, 08 over four grades (taken from Kersten 2009a:289)

This finding is especially interesting for our analysis insofar as we can postulate that the grammatical function of V-s is already in place in grade 2. The bulk of the grade 2 transcripts are assigned to the developmental Groups 2 and 3 in this analysis (Table 4.11). It should thus be expected that a pure aspectual effect for V-s will only become apparent in the data of Group 1, and that at later times the effect will be either diluted or even completely cancelled out by the grammatical function. As a matter of fact, this expectation matches the finding for the distribution of V-s in the aspectual analysis exactly (cf. section 5.1, Figure 5.10).

This result, which has been pointed out in previous studies, emphasizes the fact that aspectual effects only pertain to specific points in time which usually apply to the early periods of SLA. Kersten (2007) has pointed out, however, that, especially with respect to V-ing, this does not necessarily have to be the case. While the data of this study show an aspectual effect with V-ing in all developmental groups, especially in grade 1 another effect seems to interact with aspectual marking: by far, V-ing is used with the highest frequency of all inflections over the three categories of ACT, ACC, and ACH, and while the use with ACT remains highest throughout the whole sample, the drop in frequency is considerable after grade 1. In a preliminary study on the same data corpus, Kersten et al. (2002) have speculated that V-ing is used as a default verb marker in general, whose predominant usage might be based on its salience, its frequency in the input due to its multiple functions, and its phonological similarity to the German infinitive marker -en (cf. Rohde 1997, Shirai & Kurono 1998). An example of Child 07 from her first-grade story is especially revealing in this context. The child first uses the (non-target-like) German infinitive (a finite verb form would have been required here). Then, a short time later she repeats the clause with the German verb, but this time she inflects it with a V-ing instruction instead:

Child 07.1:

The boy *rufen* the frog.

The boy *ruf*ing the frog.

In fact, a similar effect can be observed in Rohde's data with respect to V-ing.

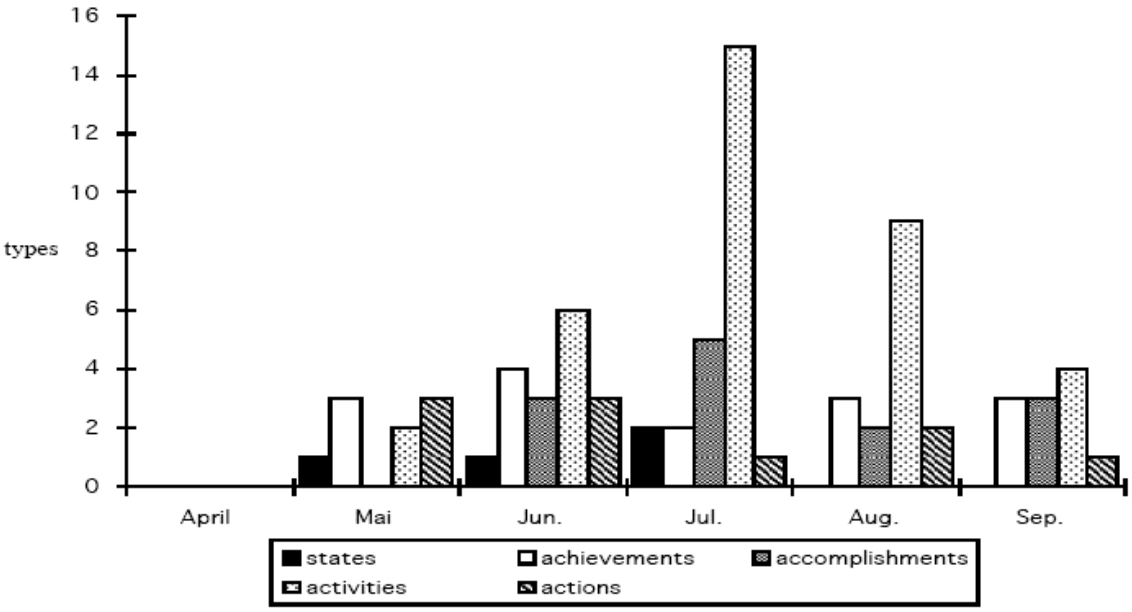

Abb. 32 - Die Bindung der -*ing*-Flexion an die Aktionsart des Verbs - Heiko

Table 2.12: Distribution of V-ing with categories of *aktionsart* over time in Rohde (1997:184)

Table 2.12 shows the V-ing development of the child who uses the inflection early in future contexts. In fact, while it is visible that V-ing is used frequently with the three categories of ACT, ACC, and ACH in the very beginning, a strong aspectual effect develops during the intermediate phases of acquisition, culminating in July, and decreasing in the final stages, when the grammatically correct usage of the progressive increases. Since Rohde reports a simultaneous (but not quantified) use of V-ing in contexts of present and past reference, and since the target-like and non-target-like grammatical use of V-ing level each other out in the first two months of exposure (p. 164), I would thus suggest reinterpretation of Rohde's *L2 Tempus Hypothesis* to some extent. The hypothesis claims that

> [d]ie Lernbarkeit von Verbflexionen wird durch Verbsemantik und Verteilung von Verben im Input gewährleistet. Verbflexionen kodieren jedoch nicht verbaspektuelle Eigenschaften, sondern temporale. Die AH wie auch die PNPD müssen daher für den L2-Erwerb zurückgewiesen werden. (Rohde 1997:216)

In light of the previous discussion, I would conclude that the results do not support a grammatically correct temporal marking in the beginning phases of exposure (cf. also Shirai & Kurono 1998), but that they do support the AH in the intermediate phase of the child's sojourn in the United States. The data thus shows prototypical effects in the beginning and intermediate stages, which (arguably) rely on early default marking, and later on aspectual effects, before a grammatically target-like function of V-ing is acquired. A similar development will be reported in the data of the present corpus in sec-

tion 5.1. The DTH, however, is clearly refuted by Rohde's data as well as by Kersten et al. (2002) and the results of the present analysis.

In conclusion, while it is sometimes difficult at the current state of research to pin down the exact functional distribution of verbal inflections in interlanguage it is safe to assume that it *correlates* with *both* aktionsart and tense marking. It seems obvious that lexical aspect is just one factor guiding language learners in the functional acquisition of verbal inflections, but, debatably, it is among the first ones to become dominant in learner language, as according to the AH.

2.2.3. Summary

In the linguistic discussion about aspect, two notions have to be differentiated. Firstly, *Grammatical* or *viewpoint aspect* is defined "in terms of temporal relations between time spans" (Klein 1994:119), i.e. the time of the focus or topic of the event talked about in relation to the underlying situation in which the event takes place. (The relation of the focal event to the time of utterance, on the other hand, represents the linguistic expression of tense.) Viewpoint aspect expresses *imperfective, perfective, perfect,* and *prospective* relations. Linguistic elements which grammaticalize these aspectual notions in English are the progressive inflection V-ing and the habitual form, e.g. "used to" (imperfective), the simple form (perfective), present and past perfect (perfect), and the "going to" future (prospective aspect).

Secondly, *lexical aspect* is a semantic notion inherent to verbs or predicates which expresses different types of situation. Four such types have been identified early in linguistic research. Although the categories have been refined and subdivided repeatedly, the four so-called *aktionsarten* (Vendler 1957) have prevailed and have been applied in numerous linguistic studies on lexical aspect. These four categories, i.e. *states*, *activities*, *accomplishments*, and *achievements*, differ with respect to their inherent semantic features: *states* are neither punctual nor telic (i.e. including an endpoint or goal) nor dynamic, *activities* are dynamic but lack telicity and punctuality, *accomplishments* are dynamic and include telicity, and *achievements* finally incorporate all three defining characteristics in that they are dynamic, telic and punctual. It has been pointed out that these features are to be regarded as prototypical features, which means that not all predicates are equally good examples of these categories.

Grammatical aspect and lexical aspect are intertwined in the respect that the lexical notions of a predicate have an influence on the conceptual expression of a proposition which can (and often is) expressed grammatically. But they are regarded as two distinct phenomena which have to be distinguished in linguistic analysis.

Studies in language acquisition found an influence of the lexical category, i.e. of the *aktionsart*, on the distribution of verbal inflections in learner language. Learners in the beginning stages of language acquisition seem to mark inherent aspect rather than tense or grammatical aspect, and they tend to use the same verbal inflections invariably with specific categories of *aktionsarten*. This distribution of verbal morphology

has been summarized under the title *Inherent Aspect Hypothesis.* In a recurring pattern, achievements and accomplishments are predominantly marked with past inflections, activities with V-ing, and states with V-s, regardless of the linguistic context. In subsequent development, past morphology spreads to activities and states, V-ing to accomplishments and achievements (but not to states), and V-s first to activities and finally to accomplishments and achievements.

The Aspect Hypothesis occurs in (at least) two different forms in the literature. An early version predicted the exclusive use of verbal inflections with their assigned lexical categories in early stages of LA. This strong interpretation, which became known as the *Defective Tense Hypothesis* (Weist et al. 1984), was quickly refuted and subsequently replaced by a weaker interpretation according to which the aspectual effect is only predominant but not exclusive in learner language.

Several theoretical explanations have been put forth to account for this phenomenon. The *Language Bioprogram Hypothesis* (Bickerton 1981) is an example for a nativist explanation, claiming that some of the aspectual distinctions are linguistic universals. The *Aspectual Semantic Transfer Hypothesis* (Ahmadi 2008) correlates the phenomenon partially with transfer from conceptual notions in the speakers' L1. (This does not, however, account for the specific distribution of categories in the L1.) The *Distributional Bias Hypothesis* (Andersen 1990, 1993) is based on the unequal distribution of verbal inflections found in the speech of adult native speakers of the target language. Since their use of verbal inflections constitutes the input to the language learner, the learner may derive the distributional pattern from the input and increase the effect through the mechanism of overgeneralization, a phenomenon which is common in learner language. Furthermore, the influence of *Salience* (of the linguistic element, Shirai & Kurono 1998), *Relevance* (for the meaning of the respective verb), and *Congruence* (with the semantic features of the verb) have been suggested as explanations (Andersen & Shirai 1994). In light of cognitive theories, the *One to One Principle* and the *Prototype Principle* are interesting as well. The *One to One Principle* (Andersen 1994) relates to the fact that learners identify a newly acquired form with only one function at first (which is supposed to be lexical in this case). This principle is corroborated by findings in the acquisition of the lexicon (Rohde 2005), where children accept only one meaning for a new referent, which cannot refer to another referent at the same time. This cognitive principle, which is at work in early first and second language acquisition, and which supposedly alleviates word learning, is referred to as the *Mutual Exclusivity Assumption* (Markman 1989, 1994). It is suggested here that the *One to One Principle* for verbal inflections is an effect of the broader cognitive principle of *Mutual Exclusivity*. The most powerful theoretical explanation, however, is proposed within the framework of *Prototype Theory* (Rosch 1973, Rosch & Mervis 1975). Cognitive prototypes are semantic categories which are claimed to establish an elementary structure in human thought and language. The prototype is the best example of a category and it combines all of the category's defining semantic features. A famous example for a prototype from one of Rosch's studies is the robin for the category

bird. (A penguin or an ostrich would represent less good examples as they lack some of the characteristic features of birds). According to the *Prototype Principle* for verbal morphology (Andersen 1991), lexical categories predominantly attract those inflections whose prototypical features correspond most strongly with their own. For example, this means that achievements which share the features +punctual, +telic, +result with the simple past, will usually be inflected with V-ed. It is suggested that the *Congruence* effect identified in earlier work is a specific manifestation of the more general prototype effect. The same holds true for the aspectual effect observed in lexical aspect marking, and for tense marking and grammatical marking as well: all of these mechanisms can be explained in terms of prototypical effects (Weist 2002).

It was also pointed out in this section that an analysis of lexical aspect has to make a careful distinction between the form and the function of an inflection in an interlanguage system. A caveat was that the function intended by the learner does not necessarily need to be connected to the linguistic context in which it is used. For instance, the aspect hypothesis posits that V-ed marks the *aktionsart* of the predicate, irrespective of whether the linguistic context is past, present or future. Since it is impossible to conclusively determine the speaker's intention, linguistic analyses can only detect correlations of the predominant use of inflections with certain categories or in certain contexts. For such analyses, a fine-grained distributional analysis (based on Pienemann 1998) was suggested, which explicitly operationalizes the criteria for assigning semantic or grammatical functions to the inflections (Pallotti 2003, 2007, Kersten 2004, 2009a). Such an analysis should take the number of contexts, the under- and over-suppliance, and the variability of a linguistic element into account. For instance, a previous distributional analysis of four individuals of the current data corpus revealed that the grammatical function of V-s is already in place in Groups 2 and 3.

Results like these support earlier findings which suggest that aspectual effects mainly pertain to the early periods of SLA. However, it has proved difficult to pin down the exact functional distribution of verbal morphology in learner language. It is safe to assume that *aktionsart* as well as tense and aspect marking are guiding factors in language acquisition, but, according to the aspect hypothesis, lexical aspect marking may occur earlier in the interlanguage system and will eventually be replaced by the tense and aspect system of the target language.

But the Aspect Hypothesis is not the only hypothesis which claims to predict the distribution of temporal morphology in the interlanguage. Especially with respect to narratives, a competing hypothesis has received some recognition in the last decades: the *Discourse Hypothesis* relates the use of verbal inflections to the dominant pattern of narrative structure in specific types of discourse. These predictions will be discussed in the following section.

2.3. *Discourse Hypothesis*

The *Discourse Hypothesis* (DH) originally developed from research into spatial representation and has been put forward as a universal mechanism of linguistic discourse. Evidence for the DH comes from sources as varied as indigenous languages and Biblical Hebrew, but it has also been applied to different contemporary Western languages (for a comprehensive overview see Bardovi-Harlig 2000). Groundbreaking research into the DH was carried out, among others, by Dahl (1984), Dry (1981, 1983), Fleischmann (1985), Hopper (1979, 1982), Hopper & Thompson (1980), Longacre (1981), Reinhart (1984), Schiffrin (1981), and von Stutterheim (1991).

Investigations into the Discourse Hypothesis are form-oriented in nature (Bardovi-Harlig (2000:277). Early interlanguage discourse analysis focused on the relation of tense and aspect morphology with the structure of narratives (Hopper 1979, Givón 1982, Dahl 1984, Kumpf 1984). These studies found that speakers use specific linguistic devices to differentiate events in the foreground of the story-line from supporting information in the background:

> Cross-linguistic investigations suggest that the distinction between background and foreground is a universal of narrative discourse (Hopper, 1979; see also Longacre, 1981). Hopper observes that competent (native) users of a language "mark out a main route through the narrative and divert in some way those parts of the narrative which are not strictly relevant to this route" (1979, p. 239). One such marking may be the use of tense and aspect (Hopper, 1979). Hopper observes that "one typically finds an aspect marker specialized for foregrounding, or one specialized for backgrounding, or both functions indicated" (1979, p. 239). Dahl reports that in some languages verbs in the foreground may carry no marking, concluding that "it is always possible to use the least marked indicative form in a narrative [i.e., foreground] past context" (1984, p. 117). (Bardovi-Harlig 1998:476)

These descriptive approaches were used in later studies as predictive hypotheses about the inflectional marking of predicates in the foreground and in the background of stories in learner language (e.g. Bardovi-Harlig 1992, 1994, 1995, 1998, for a detailed overview of recent research see Bardovi-Harlig 2000). The difference between these two concepts will be explored in more detail below.

2.3.1. Terminological disambiguation

As stated above, evidence from cross-linguistic studies has led to the claim that the distinction between *foreground* (FG) and *background* (BG) is universal in narrative discourse (e.g. Hopper 1979, Longacre 1981). However, not all languages (and, as will become obvious later, not all speakers of a language) indicate this distinction in the same way. As a consequence, the definition of these two contexts is not as straightforward as those referred to in the AH. The definition of FG refers to a cluster of semantic features which may or may not characterize a foregrounded event in its entirety. The BG, on the other hand, is mainly defined by "negative evidence", i.e. by exclusion

of the features which are characteristic for the FG. This poses a problem for the methodological approaches of studies within the DH framework. For this reason, the next sections will identify such features as have been used repeatedly for the definition of discourse grounding, and discuss them in light of methodological coding considerations (section 3.2.4).

2.3.1.1. *Foreground*

The term *foregrounding* first emerged in the tradition of Russian formalists and British stylicists (cf. Douthwaite 2000) and focused mainly on the effect of linguistic *salience*. The notion of FG in temporal semantics derived from this tradition but subsequently took a different direction: The current DH focus on *sequentiality* rather than on salience may indeed coincide in many examples, but it may also collide with it in others. In fact, the definition of the FG is very closely linked to that of a narrative in general, which according to Dahl (1984:116) is defined as "the speaker relat[ing] a series of real or fictive events in the order in which they took place."

This chronological order of events, which has variously been called story line, plot line, skeletal structure of a story, temporal structure, main structure etc., is the basic mechanism which merges all defining features of the FG. FG clauses pertain to the "main" events related in the story, which are in the focus of the story-line (Hopper 1979). A main characteristic of FG clauses is that they are depicted as temporally bounded: if events succeed each other chronologically, with a shift in the narrative focus from one event to the next, then each event must begin after the preceding event is finished, and it must end before the next event starts. Reinhart (1984:801) uses the criteria of punctuality and completeness to express the same notion. This can be defined as an anaphorical BEFORE-AFTER relation (Housen 1995). In that sense it can also be said that FG events are temporally (and, most often, conceptually) related to each other. "The temporal point of reference of any one event in the foreground is understood as following the event preceding it" (Bardovi-Harlig 2000: 279).

Dietrich et al. (1995), who base their account of the acquisition of temporality on Klein's model (1994, cf. section 2.2.1), describe the relation AFTER, which holds between FG events, such that all TTs precede TU, and all TTs create an anaphorical chain (based on Clark 1971, Labov 1972). They call this relation the *Principle of Natural Order:* "Unless otherwise specified, order of mention corresponds to order of events." (1995:27).

The data excerpt in Table 2.13 illustrates this principle. Clauses 20-23 are juxtaposed without any temporal indication, but it is clear from the focus of the plot that the main character pursues these actions chronologically. Clause 24 finally indicates this temporal relation with the use of an adverbial. Temporal adverbials are rare in the data of Group 1 anyway, and on average only the more advanced children use them frequently in first grade.

Child 15 (Grade 1):

No.	Clause	Lexical Aspect	Grounding
20	the boy going of the stone	ACC	FG
21	and the boy going of a deer	ACC	FG
22	and the deer go away	ACC	FG
23	and the boy falling in the water	ACH	FG
24	and then go the boy of the tree	ACC	FG

Table 2.13: *Principle of Natural Order* of bounded events in the foreground (Child 15.1, clauses 20-24)

In addition, the FG has been claimed to contain exclusively perfective viewpoint aspect (e.g. Dietrich et al. 1995). This comes as a natural consequence of the chronological order of bounded events. Another consequence of event sequencing is the effect that FG clauses move forward in time (Dry 1981, 1983). Therefore the test question which is used in most studies differentiates between FG and BG (e.g. Bardovi-Harlig 2000), i.e.:

> What happened next?

This is based, for instance, on Schiffrin's (1981:47) proposition that the order of FG clauses, or in her terminology of *narrative* clauses, cannot be changed without changing the meaning of the story. Thus, a second test question can be formulated as follows:

> Does a reverse order of event A and event B change the meaning of the narrative?

To this list, Dry (1983) adds that the information in a foregrounded clause must be new, whereas background clauses include information already given. Further defining features of the background are listed in the following section.

2.3.1.2. *Background*

The *background* has often been defined by reversing the features identified for the foreground. For instance, Dietrich et al. (1995) defined the FG as the default in a narrative, and the BG as a violation of the default. Yet in our current framework, the FG should better be described as the prototypical concept which constitutes a narrative. The prototype for a FG clause then includes such features as +bounded / +complete, +perfective, +sequential, +new. By contrast, the BG features are -bounded / -complete, -perfective, -sequential, and -new.

The function of BG clauses also differs from that of FG clauses. The functions which have been quoted in the literature are diverse. Bardovi-Harlig summarizes:

> In contrast to the single function of the foreground, which is to carry the story line, the background has many individual functions which together serve the purpose of supporting the foreground. Although events reported in foreground clauses are understood to be

> sequential, background events are often out of sequence with respect to the foreground and to other background events. The background does not itself narrate main events, but provides supportive material which elaborates on or evaluates the events in the foreground (Hopper, 1979). (Bardovi-Harlig 2000:282)

These supporting functions can express contextualizations, explanations, identifications, comments, clarifications, simultaneous or prior events, predicitions, or descriptions which set the stage for the narration (e.g. Aksu-Koç & von Stutterheim 1994, Bardovi-Harli 1998, Dietrich et al. 1995, Housen 1995). Dietrich et al. claim that the BG is often expressed syntactically via subordinate clauses.

The classification of FG and BG is not without problems, though. Table 2.14 summarizes the features and functions which have been identified for FG and BG so far.

Function	Foreground	Background
event type	main events, main focus, new information	side events out of focus given information
temporal structure	chronological sequence, moves forward on time line	out of chronological sequence, simultaneous, anterior, posterior, or out of time line
semantic function	story line	explanations, evaluations, comments, identifications, descriptions of scene, scene setting, etc.
lexical aspect	bounded, punctual, complete	unbounded, not punctual, not complete
grammatical aspect	perfective	imperfective
grammatical structures	main clauses, realis	subordinate clauses, modal constructions, negatives, irrealis etc.

Table 2.14: Semantic, lexical and conceptual functions which occur with high frequency in FG and BG clauses

Nonetheless, it must be mentioned that both FG and BG are regarded as cluster concepts (Bardovi-Harlig 2000)[18] and that all of these features usually do not coincide in one event (e.g. Dry 1992, quoted in Bardovi-Harlig 2000:279). As a consequence, many of these features depend on each other. As Housen underlines, this might become problematic from a methodological point of view:

> von Stutterheim (1986) and Trévise (1987) have pointed out that the application of the notions of foreground and background to the analysis of temporal discourse structure is not without methodological problems. The link between the discourse function of foreground/background and the notion of perfective/imperfective aspect should be estab-

18 Bardovi-Harlig (2000) mentions this only for the FG, but the same is true for the BG as well.

> lished independently from formal criteria (e.g. the occurrence of formal markers) **to avoid circularity of analysis**. This has not always been the case (partly because the notions of foreground and background are still too vague conceptually to allow for a purely functional operationalization). (Housen 1995:95, emphasis is mine)

The issue of circularity is a serious threat to the validity of data analysis. It will be discussed in more detail in section 3.2.4.

2.3.2. Discourse predictions for L2 narrations

In SLA research, studies have shown that learners tend to mark the differences between FG and BG through tense-aspect morphology in their interlanguage narratives as well. These findings led Bardovi-Harlig to the formulation of the *Interlanguage Discourse Hypothesis* (henceforth simply called the *Discourse Hypothesis*):

> **Discourse Hypothesis:**
>
> Learners use emerging verbal morphology *to distinguish foreground from background in narratives.*
>
> (Bardovi-Harlig 1994:43, emphasis mine)

The first SLA case studies on discourse grounding as reported by Bardovi-Harlig (2000) found that their learners indeed distinguished between FG and BG in their data, but the results were inconsistent as to the use of verbal inflections: Russian learners of English were found to use the simple past in the FG and the uninflected base form in the BG (Flashner 1989); an English-speaking learner of L2 Dutch used present perfect in the FG and different present forms in the BG (Housen 1994); base-forms in the FG as opposed to marked forms in the BG were found in studies by Kumpf (1984) and Givón (1982).

For L2 English, subsequent studies (summarized in Bardovi-Harlig 2000) revealed a more consistent pattern. Evidence from several studies with a larger data corpus (32 learners, Bardovi-Harlig 1995, 74 learners, Bardovi-Harlig 1995, 1998) suggests that second language learners of English mark the **FG** predominantly with **simple past inflections (V-ed, V-irreg)**, whereas the **BG** primarily attracted **non-past**. These results corroborate the findings of Flashner's (1989) study and form the basic predictions of the DH.

Although quantifying all verbal inflections (V-past [which includes regular and irregular past], V-ing, V-s ["pres" in her tables], and V-ø), Bardovi-Harlig only analyzes the use of **V-past** and **V-ing** with lexical aspect and grounding in her studies. Predictions for the distribution of V-s and the base form remain unresolved. Yet, in her comprehensive book on temporal morphology (Bardovi-Harlig 2000) she also raises the issue of tense-switching in narratives which include the linguistic device of *historical present*, which has been identified in FG clauses as well (Dry 1981, 1983, Schiffrin 1981, Wolfson 1979), albeit to a smaller degree than simple past forms. Bardovi-Harlig concedes that

> [t]he phenomenon of nonpast in the foreground raises interesting issues regarding the interpretation of the use of nonpast in interlanguage narrative: namely, the extent to which learner use of nonpast can be interpreted as "historical present" rather than non-use of past. Equating all learner base forms with historical present clearly meets with counterevidence from distributional patterns. Because historical present does not occur in the background, but many cases of learner base forms do, background base forms are unlikely to represent attempts at historical present. The issue of historical present and tense switching is unresolved in interlanguage narrative studies and would make for interesting future research. (Bardovi-Harlig 2000:284f)

The issue of tense-switching is an important phenomenon in the current data set as well.[19] But this only further complicates the predictions concerning the use of V-s. Two conflicting views can be derived from the previous theoretical remarks: the observations concerning the narrative present relate V-s to the FG, while the original DH should assign to the BG, which is said to attract non-past inflections. The focus of this analysis will include V-s and the base form in addition to the past inflections and V-ing. As yet another difference to Bardovi-Harlig's studies, following the example of Rohde (1997), the past inflections will be regarded separately as V-ed and V-irreg.

Bardovi-Harlig (2000:281) points out that narratives by beginning L2 learners generally only depict the FG. This is not surprising given that the FG has been identified as the prototype. As discussed in section 2.2.2.2, learners usually start using the prototype of a conceptual notion before they move on to less prototypical elements. This tendency also holds true for the present corpus. Although the Group 1 transcripts already contain instances of BG, the number of BG clauses increases steadily over the four developmental groups.

Lopez Ortega (2000), based on Véronique (1986), points out that with increasing competence, "dependence on the systematic use of verbal morphology to create foreground-background distinctions decreases as language learning develops" (p. 490). More advanced narratives contain adverbials and other linguistic advices in addition to verbal inflections to differentiate between FG and BG in a story. It is thus to be expected that the strict inflectional marking of grounding decreases in higher proficiency levels to make way for a more grammaticalized functional distribution of the inflections.

2.3.3. Summary

The differential marking of *foreground* and *background* has been identified as a universal technique of narratives. They differ in regard to their semantic function within the discourse. The FG relates the main events of the story which happen in chronological sequence and propel the plot-line forward in time, while the BG includes supportive information which is not in chronological sequence with the main events and

19 According to Shirai (2007) the conditions for switching still remain unclear in linguistic research and are subject to crosslinguistic variation.

contains explanations, evaluations, comments, identifications, scene descriptions, or the setting of the scene.

In the current theoretical framework, FG and BG can be regarded as prototypes for narrative structure. But both notions represent cluster concepts which usually combine some but all of their prototypical features in each clause. The characteristic semantic features which have been identified for the FG include +bounded / +complete, +perfective, +sequential, +new, whereas the BG features are -bounded / -complete, -perfective, -sequential, and -new. Based on these features, the following test questions have been proposed for the differentiation between FG and BG:

> What happened next?
>
> Does a reverse order of event A and event B change the meaning of the narrative?

It has to be kept in mind, however, that these features are somewhat circular because they are determined by each other. This poses a problem for data coding.

The *(Interlanguage) Discourse Hypothesis* predicts that "Learners use emerging verbal morphology to distinguish foreground from background in narratives" (Bardovi-Harlig 1994:43). For the acquisition of English it specifies that learners will use simple past to indicate the FG, and non-past inflections to mark the BG in a narrative. The predominant distribution of V-past in the FG and V-ing in the BG has been supported by several large studies. However, the status of the base form and of V-s in the grounding pattern remains unresolved. While the DH predicts a BG use for non-past inflections, other studies have found a strong tendency towards the use of narrative present in the FG. The present study will thus focus on V-s and the base form in addition to V-past and V-ing in order to shed more light on these conflicting predictions.

2.4. Predictions combined

It has been understood for quite some time that both lexical semantics and discourse structures are intertwined in shaping a learner's expression of temporality (Dahl 1984, Dry 1981, 1983, Bardovi-Harlig 1994). Both hypotheses discussed so far, the *Aspect Hypothesis* and the *Discourse Hypothesis*, make predictions about the distribution of verbal inflections However, these predictions do not coincide in all respects. At this point of theoretical reasoning, it is time to take a look at both hypotheses in combination. Bardovi-Harlig (2000) asks "How can apparently competing hypotheses be supported?" and goes on explaining:

> The answer lies in the fact that although the hypotheses seem to be distinct (one dealing with lexical aspect, the other with narrative structure), both rest on shared features of temporal semantics … This becomes clearer when we consider the temporal criteria for foregrounding which were identified by Reinhart (1984): sequentiality, punctuality, and completeness. Two of the criteria can be related to characteristics of lexical aspectual classes. The criterion of punctuality is the defining feature of achievements, and completeness relates to both achievements and accomplishments … Sequentiality – or "nar-

> rativity," in Reinhart's (1984) terms – is not related to aspectual class directly, but only events which are reported as completed can be sequenced (Dowty, 1986), and what can be sequenced can be foregrounded. Because of the overlap of features which determine grounding and those which determine lexical aspect, both the aspect hypothesis and the discourse hypothesis can be supported by the same data. (Bardovi-Harlig 2000:300)

Table 2.15 illustrates these predictions.

Lexical Aspect	Foreground	Background
STATES	past / non-past	non-past / non-past
ACTIVITIES	past / non-past	non-past / nonpast
ACCOMPLISHMENTS	past / past	non-past / past
ACHIEVEMENTS	past / past	non-past / past

Table 2.15: Combined predictions of *Aspect Hypothesis* and *Discourse Hypothesis* according to the past – non-past distinction (shaded areas indicate identical predictions)

As Bardovi-Harlig points out, both the AH and the DH predict simple past morphology to occur with telic verbs in foreground clauses, and lack of simple past morphology with atelic verbs to occur in the background. Thus, in this kind of inflectional distribution, the two theories complement each other: if telics (ACC, ACH) occur with simple past in the FG and atelics (STA, ACT) without simple past in the BG, this lends support to both hypotheses.

This is not the case, however, if atelic verbs occur in the FG, e.g. the use of activity verbs which depict a sequence of events. The other diverging cases are telic verbs used in the background, e.g. in the relation of an event out of sequence, which may be used as explanation, asf. In such cases, the two hypotheses make different predictions about the distribution of verbal inflections, i.e. "[t]he discourse hypothesis predicts high use of simple past regardless of lexical aspectual class, and the aspect hypothesis predicts low use of simple past in atelic predicates regardless of grounding" (Bardovi-Harlig 2000:303).

It has to be pointed out, however, that the DH predictions are much more vague with respect to the BG than with respect to the FG or the *aktionsarten.* All latter categories are assigned specific inflections in English. This even holds true for the FG, as the *simple past* only contains V-ed and V-irreg. Yet, the use of *non-past inflections* in the BG represents a cluster of three different possible inflections. Without clearly stating this, the studies quoted above give the impression that V-ing is considered the

most prototypical BG inflection. (This can be derived from the fact that the other two non-past inflections are not considered in the final analyses at all.) If this is the case, Table 2.15 has to be revised to include the actual inflections which are predicted for the different categories. These are depicted in Table 2.16.

Lexical Aspect	Foreground	Background
STATES	V-ed/irreg / V-s	V-ing / V-s
ACTIVITIES	V-ed/irreg / V-ing	V-ing / V-ing
ACCOMPLISHMENTS	V-ed/irreg / V-ed/irreg	V-ing / V-ed/irreg
ACHIEVEMENTS	V-ed/irreg / V-ed/irreg	V-ing / V-ed/irreg

Table 2.16: Combined predictions of *Aspect Hypothesis* and *Discourse Hypothesis* according to verbal inflections (shaded areas indicate identical predictions)

Table 2.16 reveals that the identical predictions are reduced from four to three concurrences: the inflections predominantly found with stative aspect, V-s, is not identical with the prototypical BG inflection V-ing. STA thus represent another interesting test case for this analysis. Will STA be influenced more strongly by lexical aspect and predominantly attract V-s, as predicted by the AH, or will they, too, attract V-ing, as other BG categories were prone to do (e.g. Bardovi-Harlig 1998, 2000)?[20] The current analysis will try to clarify this pattern.

The results of Bardovi-Harlig's studies shed a very interesting light on the interaction of lexical aspect and grounding. She finds that ACT and ACC are inflected differently according to whether they occur in the FG or the BG. When occurring in the FG, they show a bias for simple past inflections, in the BG however, the bias is stronger for the progressive (2000:308). The overall use of the past is higher with ACC, though, which thus additionally show sensitivity to lexical aspect. Only a combination of both the AH and the DH can account for this phenomenon. ACH, on the other hand, show very little effect of grounding. They are predominantly inflected with simple past, regardless of FG or BG, and thus most clearly follow the pattern predicted by the AH.

Based on these results, Bardovi-Harlig (2000:313) derives her predictions about a *hierarchy of inflectional distribution* for "learners with limited linguistic resources":

20 Stative verbs in the BG were rare in Bardovi-Harlig's analyses, so she was not able to give a conclusive answer to this question.

> Achievements are the predicates most likely to be inflected for simple past, regardless of grounding.
>
> Accomplishments are the next most likely type of predicate to carry the simple past. Foreground accomplishments show higher rates of use than background accomplishments.
>
> Activities are the least likely of all the dynamic verbs to carry simple past, but foreground activities show higher rates of simple past inflection than background activities. Activities also show use of progressive, but this is limited to the background.

This hierarchy can be explained by the fact that ACC combine semantic features of both ACH and ACT. Punctual ACH are most prototypical for the FG and for the past inflection because they do not include duration. On the other hand, ACC are durative like ACT and therefore represent an intermediate category. According to Bardovi-Harlig's interpretation, this is expressed by the less strong affiliation with V-past.

She was not able to make conclusive assumptions about the acquisitional pattern of States since her early learner corpora did no include enough instances. She concludes that

> **lexical aspect and narrative structure conspire to shape the distribution of tense-aspect morphology in interlanguage.** Whereas the basic semantic features of predicates attract verbal morphology with the same features, in actual production these inflected predicates are pressed into the service of communication and may take on features appropriate to the narrative structure, thus going beyond the most basic predicate-level pairing of verbal and morphological features. The understanding that interlanguage temporal systems are shaped by both the semantics of lexical aspect and the pragmatics of discourse provides a point of departure for future research. (Bardovi-Harlig 2000:317, emphasis is mine)

As mentioned above (section 2.2.2.2), however, it must be underlined that the predictions of both hypotheses aim at the descriptive level of data interpretation, not at the explanatory level. Both hypotheses arose from the observation of a distributional bias found in learner output, and they aim to describe the pattern of this distribution. While several explanatory frameworks for such patterns have been suggested, neither the AH nor the DH make any claims concerning the reasons for this bias.

3. Methodological considerations

The previous sections already pointed to several controversial issues concerning the operationalization of coding criteria for lexical aspect and discourse grounding. This section will describe the steps of data analysis which were undertaken to test the two hypotheses in question, the AH and the DH. The first part will state the research questions and describe general coding conventions. In the following two sections, the criteria used to analyze *aktionsart* and grounding will be discussed and explained in detail.

3.1. Research questions

According to the suggestions in the two theoretical frameworks, the guiding research questions for this study are the following:

1. Do the verbal inflections in the child narratives mark lexical aspect?
2. Do the verbal inflections in the child narratives mark discourse grounding?
3. If so, which of the two effects prevails in the data corpus? If so, how do they interact?
4. Do the data reveal an acquisitional development with respect to aspect marking and grounding over time? If so, what pattern can be found in the narratives?

On the basis of several preliminary studies (Kersten et al. 2002, Kersten 2007, Kersten & Rohde 2007, Kersten 2009a), it is to be expected that in the early stages of acquisition, the children will follow the predictions of the Aspect Hypothesis in their use of verbal inflections. However, as their narrative competence develops, they are expected to use verbal morphology increasingly, according to the grounding principles of the Discourse Hypothesis.

3.2. Data coding

3.2.1. General coding conventions

3.2.1.1. Transcripts and clauses

For the analysis of this study, 70 oral narratives in L2 English (grades 1-4) were transcribed and coded. Some of the conventions suggested by Bardovi-Harlig (1998, 2000), Dowty (1986), Dry (1981, 1983), Fleischmann (1985) and Schiffrin (1981), were adopted for the coding of the data. The other conventions were created by the research group in the *Kiel Immersion Project* (cf. section 4.1.1) and further developed specifically for this study.

First, the data were transcribed (cf. section 4.4) according to the conventions used in the Kiel research team (e.g. Kersten et al. 2002, Lauer & Hansen 2001). These are illustrated in Table 3.1.

Code	Explanation
No.	anonymization of the children
I	interviewer (German-speaking)
IE	interviewer (English-speaking)
P	minute taker *("Protokollant")*
#	pause
/	hesitation, self-correction
( )	commentary
(?)	uncertain transcription
[ ]	phonetic transcription
!	emphatic utterance
?	question / rising intonation
" "	direct speech
|	two simultaneous utterances
XXX	incomprehensible utterance
italics	L1 utterance

Table 3.1: Coding conventions for data transcripts

The data were transcribed including all hesitations, self-corrections, pauses, L1 utterances, questions and interviewer interjections. If necessary, comments were added. In a second step, all of the learners' utterances in the transcripts were converted into bare clauses containing one predicate and its complements. For this reason, it was necessary to delete the following from the transcripts:

- the interviewer's utterances
- the transcriber's commentaries
- punctuation marks (unless they were important for the meaning of the clause)
- quasi-lexical conversational fillers such as *ehm, mhm* (Rieger 2003)
- pauses
- hesitations
- incomprehensible utterances (unless they did not affect lexical aspect and grounding analysis of the clause)
- direct repetitions (the first instance was counted)
- self-corrections (the learner's corrected version was counted)
- L1 comments by the learner (L1 insertions in L2 clauses were retained)

Transcript	Clauses
IE Hello, I'm curious to hear the story!	
3 The frog sitting in the glass. # The boy # he's sitting sh/ *hier* # sitting *neben* the glass.	1. the frog sitting in the glass 2. the boy he's sitting *neben* the glass
IE Can you say it one more time? I didn't hear you.	
3 He's # s/ sitting on the floor.	3. he's sitting on the floor
IE Okay.	
3 The boy he's very very tired.	4. the boy he's very very tired
IE Okay.	
3 The dog, too.	5. [the dog, too]
IE Mhm.	
3 The boy # (blättert) he's oping the # (flüstert) *wie heißt das nochmal*? # hm # (es klingelt) he's oping the # he's oping the (lange Pause) XXX (leise auf Deutsch)	6. the boy he's oping the XXX
IE Never mind. Just say something else.	
3 Mhm. (blättert) The dog fallding of the # floor.	7. the dog fallding of the floor
IE Okay. Mhm.	
3 The boy is very very angry of the # dog.	8. the boy is very very angry of the dog
IE Can you speak a bit louder? I can't hear you very well.	
3 Yes.	
IE What did you say? The boy is?	
3 the boy is very very angry of the dog.	
IE Okay. Yeah, now I got it.	
3 The boy he's # the b/ # dog he's # is very very hungry and # was XXX(falld?)ing (summt) *oh mann, die nächste Seite, die ist blöd* XXX (blättert)	9. the dog he's [Pause] is very very hungry

Table 3.2: Clauses extracted from a transcript according to the conventions (Child 03.1)

In total, 2434 clauses were analyzed in the corpus. Table 3.2 gives an example for the application of these conventions to an excerpt from Child 03 grade 1. Child 03 was rather shy and insecure in first grade; for this reason her narrative contained many pauses, fillers and comments which subsequently had to be deleted for the analysis.

Thirdly, the clauses were coded according to *aktionsart*, grounding, and verbal inflection. Lexical aspect was analyzed first, before and independent of the grounding status of the clause, then the grounding status was classified, and finally the abbreviation for the verbal inflection was added. The following categories were applied to the data (for explanations see sections 3.2.3 and 3.2.4):

Aktionsart:

STi	inchoative States
STA	States
ATi	inchoative Activities
ACT	Activities
ACC	Accomplishments
AC-i	Accomplishments without focus on inchoativity
ACH	Achievements
AH-i	Achievements without focus on inchoativity

Grounding:

FG	Foreground
BG	Background
¬FOC	sequenced clauses without Focus on main event
AMB	Ambiguous grounding

Verb Morphology:[21]

V-ing	progressive form without / with non-target-like / with target-like auxiliary[22]
V-ø	uninflected base form
V-s	3rd person singular
V-ed	regular past
V-irreg	irregular past
perfect	present / past perfect forms
cop	copula
other	all other grammatical or interlanguage forms in the data

In this analytical step, the following clauses were excluded from coding:

- direct speech (the introducting words were included)
- uninterpretable forms such as phonetically unclear forms or verbs with identical past forms (*put*, *hit*, etc.)
- clauses with verbless predicates
- modals
- negation

Direct speech had to be excluded since the tenses used in direct speech may differ from those in the narration frame.

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21 Note that although the explanations refer to the grammatical use of the inflections in the target-language, this function is not expected in the narratives.

22 As it does not make grammatical predictions, it is irrelevant for the AH whether the -ing inflection is attached to a target-like or non-target-like verb complex.

3.2.1.2. Exceptions in data analysis

Some exceptions to these rules need to be discussed separately. As a rule, in creative interlanguage forms such as **camed*, **fells*, or **is jump*, the final inflection was counted, i.e. V-ed, V-s, and V-ø, respectively.[23] Examples for the latter phenomenon from the data:

Creative Interlanguage Forms

6.2.20 and the dog is fall down
8.1.30 n' then the boy are say
13.1.13 the boy he's [Pause] jump on a(the?) tree
13.3.33 and all bees were go behind the dog
18.1.6 and on the next morning are see the dog and the boy
18.1.23 and the dog is run away
18.1.32 she's go to the tree

Negations were counted if the infinitive was inflected contrary to the rules of the target language:

Negations

1.4.34 but he did not fell to the ground
8.4.37 bu' he don't finds anything
13.3.13 and the dog doesn't came out of the glass
14.2.17 and he don't came out of the glass *mit* his head
18.3.39 but he don't found the frog
Or, the negation did not influence the finite predicate grammatically:
3.1.16 but the frog came not
7.3.21 and then the head go not out of the bottle

The same principle was applied to modal verbs:

Modals

3.4.30 and the dog must ran
15.4.47 that she shall got quiet

All examples quoted above are creative interlanguage constructions which were coded because they were inflected by the learners.

23 What is important here is the way the lexeme is inflected, not the way in which it is grammaticalized with or without auxiliary. Thus, *is jump* was interpreted as V-ø. I am grateful to Alex Housen (personal communication) for suggesting this convention.

3.2.1.3. Token- and type analysis

After coding all clauses according to lexical aspect, grounding, and verbal inflection, both a token and a type analysis were carried out (section 4.5.1). The token analysis was carried out automatically with the help of a database function, the type analysis was subsequently counted by hand for each transcript. The transcripts were then ordered according to four developmental groups (cf. section 4.5.3), and another token and type count was carried out for the data of the four groups. The copula was deleted from the data of the four final groups since it is a tense-carrier in itself, as Bardovi-Harlig (2000:316) argues, and in addition it unnecessarily inflates the number of STA. Preliminary analyses including the copula (Kersten 2007, Kersten & Rohde 2007) have shown that the effects observable with STA verbs become diluted in the presence of the copula. Moreover, clauses with ambiguous grounding status were neglected in this final group analysis. More details on the group analysis and the statistical calculations are provided in section 4.5.4. The remainder of this chapter will be devoted to the specific problems and conventions related to the coding of lexical aspect and grounding.

In order to make falsifiable predictions (Popper 1959, 1963, 1972) about the interrelation of verbal inflections and lexical aspect in discourse, the criteria of analysis have to be operationalized for the present study. The coding of the child narratives according to *aktionsarten* and grounding, respectively, raises several questions about definitions and use of the technical terms. Different authors have applied these terms in diverse manners. Whereas the coding criteria for lexical aspect have been laid out quite clearly (e.g. Bardovi-Harlig 1998), the criterion used for grounding remains less obvious. The following sections will attempt to shed some light on these problematic issues and suggest practical answers to the coding problems. However, before focusing on the practical application, a few words about the researcher's perspective on the data are in order.

3.2.2. Analytical perspectives on the data

The first fundamental problem that researchers encounter when deciding on their analytical tools is the perspective they take on the data presented to them. It is a well-known fact in analytical research that the focus of each analysis is a selective one. Research thus always runs the risk of influencing the results through the focus and the methods which are chosen (Quine 1953, Schumann 1984, Jordan 2004). Since the work of Immanuel Kant (in his groundbreaking 1787 *Kritik der reinen Vernunft*) we have known that gaining *objective knowledge about "reality"* is impossible; our knowledge is always mediated by our particular subjective perspective. The "meaning" of the knowledge we gain through a particular operation is therefore always an interpretation by the subject.

For research studies this means that our results are only as good as our research methods. In other words, it is important to keep in mind that our results are highly dependent on the method we choose, i.e. on the focus, selection, categories, exclusions, and on other analytical tools. The choice of the right research method for the hypothesis in question is the first and major challenge for the validity and the falsifiability of each study (Popper 1959, 1963, 1972).

What does this mean for the present study? Apart from the technical conventions mentioned above, a fundamental question arises with regard to the categorization of the parameters in question: the categories of lexical aspect and grounding.

This problem can be formulated as follows: The hypotheses predict that learners mark a specific semantic or pragmatic characteristic of a part of speech with specific inflections. Does this mean, that the hypotheses also make a prediction about the *interpretations*, or *interlanguage rules*, learners apply at a certain point in time? If this were the case, the question would arise as to how these learner interpretations can be measured and verified. The answer to this problem is not as straightforward as it may seem. As Robison metaphorically observes:

> Subjectivism has clouded the delineation of aspectual categories in SLA research, and there is a lack of consistency between studies in the way that these categories are defined. (Robison 1995:349)

The problem is that interlanguage rules are mainly applied in an implicit, automatic and subconscious way by the learners, and that the learners lack the means to explain their choice in abstract linguistic concepts. Still, regularities of interlanguage systems strongly suggest that learners apply highly regularized rules to the language, even though these rules need not correspond to those of the target language.[24]

But how are we able to find out about them? Theoretically, three different basic perspectives are possible: 1. the learner's own perspective, 2. the perspective of the learner's first language, and 3. the perspective of the target language.

> … what should one try to capture when coding for inherent aspect in interlanguage production? Should one try to capture the inherent aspectual meanings which the learners assign to the L2 verbal lexemes, even if these meanings are colored by the semantic representation of the learners' L1? Or should one try to capture the prototypical inherent meanings with which the verbs are used by native speakers of the L2? Or to phrase the issue differently: should investigators of the inherent aspect in SLA adopt a *target language perspective* and analyze learner data in terms of the meanings, functions and categories that hold in the (native) target language? Or should they adopt an *interlanguage perspective*, and analyze the forms in learner speech in terms of the meanings,

24 This phenomenon led to theories about an innate *language acquisition device* (Chomsky 1965) in theories on generative grammar, i.e. specific pre-programmed, innate grammatical procedures in the human brain which guide and limit the learner's hypotheses about the rules of the language. Evidence for this phenomenon is seen in the so-called *logical problem of language acquisition* (Chomsky 1986) which argues that children are able to acquire full-fledged procuctive language systems in spite of the so-called *poverty of the stimulus*, i.e. limited and deficient linguistic input.

> functions and categories that hold in the learner's own interlanguage system rather than in terms of the TL system? (Ahmadi 2008:183f)

In a much-quoted article published in 1983, Bley-Vroman cautions against the *comparative fallacy* which is involved when researchers apply the target language perspective to interlanguage data.

> … in order to characterize the language learner's linguistic competence in the L2 accurately, interlanguage must be analysed in its own terms. … According to Bley-Vroman, the comparative fallacy in interlanguage studies, which results from a concern with the target language is likely to have a disastrous effect on the investigation of interlanguage. Specifically, the use of analytical concepts defined relative to the target language scheme (such as obligatory contexts, error and target-like use) is unlikely to illuminate the nature of interlanguage competence. … Adjemian (1976) stressed the importance of investigating interlanguage competence independently of not only the target language system but also the native language system. … We argue that the comparative fallacy in interlanguage studies, regardless of the nature of the bias (i.e., target language or native language) can lead to the underestimation and/or overestimation of the learners' linguistic competence." (Lakshmanan & Selinker 2001:395f)

Lakshmanan & Selinker (2001) discussed several SLA studies with regard to the problem of the comparative fallacy. This publication triggered some discussion on appropriate research designs in the journal *Second Language Research* which included, among other things, the discussion of lexical aspect analyses (Lardiere 2003, Shirai 2007). As these issues are highly relevant for the analysis of the present study, the advantages and disadvantages of these different perspectives on learner data will briefly be discussed below.

3.2.2.1. Interlanguage perspective

Each of these three perspectives has its own problems. Consider the first one: The interlanguage perspective focuses on the hypotheses of each learner about the rules of the L2 s/he is in the process of acquiring. It has been underlined repeatedly that these interlanguage rules do not equal those of the L2, although interlanguages are considered regularized linguistic systems in their own right (Selinker 1972). Lardiere cautions that

> [w]ithout some kind of independent evidence for the nature of the learner's own lexical semantic representation of the verbs in question, the foundation for assigning them Vendler categories may be undermined. (Lardiere 2003:138)

Yet what possibilities do researchers have to discover the learner's interlanguage rules? One possibility to capture the learner's hypotheses is, for instance, the use of introspection (Faerch & Kasper 1987). This was attempted to some extent by Ahmadi (2008). A general problem of introspection with respect to difficult linguistic concepts is, however, that the learners usually lack the technical knowledge to understand, let alone to talk about, such issues. And if they express the notions in question in their own words, e.g. through periphrases or metaphors, the results remain impressionistic at best, and

are still subject to the interpretation of the researcher. What is more, in the present study we interviewed children of the ages of 6-10. In addition to the lack of technical terms for linguistic problems these children cannot be expected to even understand the abstract problems investigated here, let alone give exact classifications of the categories they use.

On the other hand, if subjects are provided with the categories under investigation in order to make introspective claims about their use, the study runs the risk of influencing the answers with a pre-established focus. Each focus excludes other possible answers which the researcher might have overlooked in the research design. Because we worked with little children, introspection was not a feasible method for this study to find out about interlanguage representations. It might be a promising approach in combination with other methods, but it needs a rigorous research design which provides informants with clear ideas of the parameters in question without simultaneously influencing their answers. This problem cannot be solved within the scope of this book.

Another approach similar to the interlanguage perspective is an adaptation of the so-called *across-category approach* (Bardovi-Harlig 2000), which will be discussed in section 4.5.4.1. This coding procedure, which was e.g. used by Rohde (1996, 1997, 2002a,b) and Salaberry (1999), focuses primarily on the verbal inflections and how they spread over different lexical categories, instead of focusing on lexical categories and how they attract different inflections. (Both calculations differ in what is considered "100%" (the respective inflections, or the respective *aktionsarten*), and they yield very different results, as Bardovi-Harlig (2000) showed, cf. section 4.5.4.1).

In my view, an adapted version of the original across-category approach may be used to the advantage of the interlanguage perspective. The original approach has the problem that it depends on individual coding decisions of the researcher with regard to the categories in question (this issue will be discussed in the following section). The coder's decisions, however, interfere with an exclusive focus on the learner's interlanguage.

To best capture the learner's intentions, it is recommendable, in my view, to ask the question:

> What characteristics do all predicates contain that are inflected with the same morpheme?

An analysis of each inflection should then list all semantic features of the predicates which co-occur with it, instead of assigning lexical (or other) categories to the predicates. This approach would reduce the risk of an imprecise coding decision on the part of the researcher. (It would not eliminate this risk altogether because the semantic features have to be assigned by the coder as well. But as the (lexical) categories are cluster concepts that contain several features at once, which all may or may not be prototypical in a given predicate, and which all run the risk of containing coding errors, the risk of ambiguous coding is higher with the "cluster" categories than with single features.) In this way, the analysis would yield clusters of prototypical features which co-

occur with each inflection. These may or may not coincide with the preformed *aktionsarten* or other categories. Moreover, an analysis with single semantic features is more fine-grained than that of cluster categories and it permits a much more accurate image of the learner's prototypical representations. (If such an analysis reveals prototypical categories marked by the inflections, these should be analyzed in a second step with a *within-category analysis* to reveal a developmental pattern of the categories with their inflections in the data corpus. For a detailed discussion of these issued cf. section 4.5.4.1.)

If such a descriptive approach is chosen, it is also recommendable to use individual analyses over group analyses. Learners who are continuously exposed to the target language go through a constant learning process; thus, interlanguage systems are characterized by a change of hypotheses and it cannot be expected that learners have identical representations of the categories in question.

Finally,

> [c]omplicating the picture even further is the possibility that the lexical semantic properties of a verb may not even be consistent within the same learner. In (3b), for instance, it is not the case that *write* always means START WRITING for Patty; rather, that is its meaning in this particular utterance. (Lardiere 2003:138)

This problem might be accounted for by a semantic feature analysis which includes the feature +/- inchoative (e.g. Jackendoff 1990, 1992, cf. section 3.2.3) and analyze it with regard to the linguistic context. Another issue which has to be taken into account is the linguistic knowledge that learners derive from their L1.

3.2.2.2. L1 perspective

The amount of influence of the L1 on the L2 has been subject to much discussion and the issue is still unresolved in SLA research (e.g. Ellis 1994, Eubank 1993/94, Slobin 1991, 1997, Schwartz & Sprouse 1996, Vainikka & Young-Scholten 1994, 1996). In particular, the transfer of L1 conceptual notions cannot be questioned (Shirai 2007). Quoting an extensive list of research, Lardiere affirms that

> L2ers' lexical semantic representations of verbs in the target language are often nonnativelike and may reflect properties of the L1, especially in the early stages of acquisition … (Lardiere 2003:139)

Thus, the second perspective which can be taken with regard to the categories under scrutiny is the L1 perspective. This, like the L2 perspective, is a question of the *researcher's perspective* on the learner data. This perspective also runs the risk of imposing a certain bias on the interpretation of learner data (Lakshmanan & Selinker 2001). In her *Aspectual Semantic Transfer Hypothesis* (section 2.2.2.2), Ahmadi (2008) discusses the assumption that each second language learner is guided, among other factors, by notions derived from their L1 (e.g. Odlin 2005, Shirai & Nishi 2002, Slobin 1991, Nishi & Shirai 2007). If the L1 interpretation of a specific *aktionsart* differs from the L2 interpretation, as Ahmadi showed for some Persian (L1) and English (L2)

lexemes, it is unclear which of the two interpretations prevails in the learner's interlanguage system. Ahmadi could not conclusively show in her data that L1 interpretations actually do play a role in learners' categorization of lexical aspect, but Nishi & Shirai (2007) found clear effects in their data. As Shirai (2007) points out, more research in needed in this area.

However, the learner's L1 transfer of lexical aspect is not the only problem in this respect. As Ahmadi argues, it is often the case that researchers who analyze a corpus have the same L1 background as the learners, i.e. they are second language speakers of the target language as well, albeit usually with higher language competence than the informants. Lakshmanan & Selinker (2001, based on Corder 1981) suggest that the use of such bilingual coders minimizes the problem of different perspectives on the data.

> We conclude with one suggestion, which was proposed by Corder (1981) long ago. … the use of 'bilingual researchers' … we intend the word 'bilingual' in a special sense: knowing both the advanced interlanguage and more earlier stages of that interlanguage. Corder claimed, that in terms of understanding interlanguage competence, such bilingual researchers might be those who are closest to the native speaker in the classical Chomsky sense. Such researchers would know several relevant linguistic systems: the native language of the learner, a very advanced state of the interlanguage, earlier interlanguage systems and the target language itself, at least in a declarative sense. … He thought that such a bilingual (or perhaps really 'multilingual') would … have 'considerable insights' into the interlanguage of the learners being studied, having been, 'at some point in his or her career', a 'native speaker' of that learner's interlanguage. … Corder argued that such researchers would be 'intuitively aware of idiosyncrasy' in the use of interlanguage forms, 'idiosyncrasy' in Corder's terms meaning interlanguage-particular use, what all SLA researchers need to discover. Such a researcher, by definition, would have systematic knowledge of interlanguage intention as discussed in this article. (Lakshmanan & Selinker 2001:414f)

While the use of bilingual coders might indeed be an advantage for the interpretation of the learners' intuitions, it is accompanied by the risk that the researchers will likewise be influenced by notions of their mother tongue when categorizing learner utterances.

Researchers need to carry out the categorization of the data themselves in all research setups except for introspection. However, a certain level of imprecision lies in these coding decisions. Undetected transfer from the L1 is only one reason for this. Ahmadi (2008) and Housen (1995) have shown that even researchers from the same language background may in part differ widely in their application of categories. As one possible method to remedy this situation, several coders from both L1 and target language backgrounds should code the data to increase interrater reliability. Even though this method will not yield 100% congruent results, it at least increases the reliability of the analysis. It will still be necessary to decide how to deal with incongruently coded clauses.

To establish the groundwork of categorical interpretation it might also be beneficial to conduct a large-scale study of native speaker intuitions about the categories in question. These should include native speakers from both the mother tongue and the

target language of the learners. It is crucial that these native speakers be in the same age range as the L2 informants, since this would account for the fact that young children may still be in the process of refining the semantic notions of their L1. Such a survey would provide a suitable basis for Shirai's demand that to "test the effect of the L1, one needs to carefully examine the lexical aspect and grammatical aspect/tense in both target and source languages" (2007:58).

Finally, in my opinion, it would be highly interesting to carry out a comparative analysis on clauses which received congruent classification by several coders and clauses which coders assigned to different categories. I would expect a strong prototypical effect in the data (which is actually visible in the coding decisions already): unambiguous examples will probably reveal a much stronger effect with regard to both predictions than ambiguous examples. Presumably, such a subdivision would yield stronger results both for prototype theory and for the two hypotheses than an analysis which combines unambiguous and ambiguous cases and relies too strongly on the interpretation of just one coder. This is a highly interesting area of future research. Unfortunately, for the present study such a rigorous methodological approach was not possible due to financial reasons and time constraints.

3.2.2.3. L2 perspective

In the L2 perspective, the perspective of the target language is applied to the data. This is the most common approach in studies of lexical aspect and grounding. The problem with this approach is that the learner's notions of the categories can be quite different from those of the target language. This is what Bley-Vroman (1983) calls the comparative fallacy (see above). Lardiere cautions:

> If coding categories such as lexical aspect classes constitute a kind of independent variable on the basis of which we draw conclusions about the likely distribution of past tense marking in line with the predictions of the Aspect Hypothesis, then we may indeed be vulnerable to the comparative fallacy. … Turning to the data coded for telicity, we immediately encounter an obvious difficulty: we cannot be sure if for Patty the contents of her lexical entries for English verbs exactly match those of English native speakers, although there clearly appears to be considerable overlap. (Lardiere 2003:136f)

This criticism is well-founded and needs to be addressed by studies of lexical aspect. Thus, the present study suggests a more fine-grained subdivision of categories in the analysis of grounding. Since it will be argued that the categories themselves underlie a prototype effect which is part of a semantic continuum (cf. section 3.2.4.2), category boundaries are not necessarily "naturally given". Different subdivision can thus alter and intensify the observed effects.

On a different but related note, the actual coding procedure for the categories has been subject to criticism as well. The functional analysis of inflections with regard to obligatory contexts is such a procedure with an L2 perspective. This issue is extensively discussed in the debate mentioned above in *Second Language Research*, starting

with Lakshmanan & Selinker's comment on Bley-Vroman's comparative fallacy (2001, Lardiere 2003, Shirai 2007). Lakshmanan & Selinker criticize this approach as follows:

> Thus, setting up obligatory contexts solely in terms of the target language is likely to lead to an underestimation of the knowledge of the learner, as only a subset of the contexts identified may be obligatory contexts from the standpoint of the learner's internal interlanguage system … (Lakshmanan & Selinker 2001:401)

While Shirai (2007) clarifies that obligatory contexts do not represent a valid analysis of lexical categories and have not been used as such in the past, these points aptly describe the problem of an L2 perspective on learner data in general.

On the other hand, one could argue that it is indispensable to take the L2 perspective into account as well, because, as a matter of fact, the L2 is the target each learner strives to reach. It can therefore be expected that the interlanguage system is shaped increasingly by that target. In particular, if one wants to measure the level of the learner's proficiency rather than the emergence of a linguistic structure or the makeup of the learner's interlanguage system, methods using an L2 perspective are warranted. The proficiency level describes the relative distance of the learner's language to the L2 target; thus it necessarily needs to be measured against the target-like functions of linguistic forms. For the emergence criterion, this holds true at least to some degree as well to distinguish the first systematic use of a structure from random variation (however, the form-function discussion in emergence is everything but straightforward, for a discussion cf. section 2.2.2.2 and Kersten 2009a, Pallotti 2003, 2007).

In research on lexical aspect, from very early on, researchers used specific test procedures to capture aspectual notions (summarized in Bardovi-Harlig 2000). These tests focus on how the categories behave in the target language with respect to the relevant semantic features (cf. section 3.2.3 Table 3.3). They thus represent a good example of an approach with an L2 perspective. With this focus, these tests are indeed not suited to reveal the learner's own notions of the categories (comparative fallacy). However, they have one major advantage which should not be neglected: they guarantee maximum methodological comparability between studies (Shirai 2007). This increases their replicability and makes the studies more reliable. Additionally, in my view, this advantage cannot be underestimated in the face of such methodological trials and tribulations as discussed above, when trying to capture the sometimes elusive phenomenon of children's interlanguage systems.

3.2.2.4. Summary and conclusion

To summarize this discussion, the problem with data coding is that "interlanguage competence cannot be examined directly" (Lakshmanan & Selinker 2001:393). The only way to interpret learner data is thus through indirect approaches which try to capture as much information about the interlanguage system as possible. Researchers need to be aware of the fact that the perspective they impose on the data and the methodol-

ogy related to this perspective will yield results which differ from those gained through other perspectives and methodologies.

> It is true, as Bley-Vroman observes, that we researchers cannot guess in advance 'the very large number of imaginable subsystems' learners make use of in constructing the target grammar (1983:10). But we have to start somewhere. It is a legitimate goal to determine where the likeliest jumping-off points are, that is, where and to what extent divergence from the target language is occurring, and what that may or may not be evidence for, especially in cases where both native and nonnative speakers are exposed to more or less the same linguistic environment. It might even be argued that it is indeed our job to try to imagine at least some of those interlanguage subsystems (Lardiere 2003:140)

Yet how can one go about finding such jumping-off points without committing the much-quoted comparative fallacy? Ultimately, it will probably prove impossible to resolve this problem. The only viable way is to reduce the fallacies as much as possible by combining different perspectives and methods in the hope that they will yield a more complete picture of learner's hypotheses about the target language. The short discussion above suggested some possible steps in this direction, without being conclusive; it was only intended to raise awareness for the methodological problems and to present some preliminary thoughts on possible directions for future research.

It was suggested in this section to account for three different perspectives which can be applied to learner language:

1. An interlanguage perspective is best suited to reveal the learner's notions of mental categories, but this perspective is the most difficult to realize methodologically. Introspection was suggested as one possible approach, but introspective approaches are difficult to design and do not seem viable for young children, as the children would need to have some abstract understanding of the categories under scrutiny. But an adapted version of an *across-category approach* (Bardovi-Harlig 2000) was discussed with respect to a fine-grained analysis of semantic features. Such an approach, it was argued, would yield a clearer and more learner-centered picture of the interlanguage system as it avoids the use of pre-established cluster categories. As clusters of several semantic features, such categories run a higher risk of "missing the point" of the learner's own notion than an analysis of single features.
2. An L1 perspective is important in order to account for possible transfer of conceptual notions from the learner's L1 (as well as that of a bilingual coder, for that matter). Some suggestions were made to integrate an L1 perspective in data analysis. Firstly, bilingual coders with the learner's L1 and a very good command of the target language should be used in addition to native speakers of the target language (Lakshmanan & Selinker 2001), as bilinguals are more sensitive to and knowledgeable about the learner's interlanguage, "having been there" at some point in their development themselves. Secondly, it would be recommendable for future research to carry out a large-scale comparative study on the notions native speakers both of the L1 and the L2 have about the categories in question. Such a procedure would yield an empirical basis for data interpretation, and it would

clearly identify the differences between the L1 and the L2, as well as the differences between individual coding interpretations by experts and the notions of the "everyday" language user. Based on the idea that several coders increase the reliability of a study, it was finally suggested to compare unambiguously coded clauses with those clauses that received incongruent coding by different coders. It is expected that unambiguous categories reveal a much stronger prototype effect with respect to the categories than the ambiguous cases, lending thus support to both prototype theory and the aspect and discourse hypothesis.

3. The final perspective, the perspective of the target language, runs the highest risk of a comparative fallacy with its research design, as it does not take into account that the learner's personal interlanguage hypotheses may differ from those of the L2, and that they may be subject to interferences from the L1. In an overall research setup an L2 perspective is indispensable, however, as it represents the target to which the learners try to adjust their language. Neglecting this perspective would mean falling into the same trap as neglecting an interlanguage or L1 perspective. In effect, this would be the comparative fallacy in reverse. With respect to the DH, a more fine-grained subdivision of categories is used in this study in order to reduce the risk of imposing pre-formed target-language categories on the data. Additionally, it was argued that the diagnostic L2 tests used in the AH framework have one great advantage: they render the studies comparable to each other. This is an advantage which should not be underestimated.

Shirai (2007) concludes:

> So, what should we do to address the problem pointed out by Lardiere in verb classification in learner language? My position is this: since we cannot be sure about learners' intentions or their semantic representations, it is probably more reasonable to be agnostic about them to some degree. But at the same time we need rigour in classification to ensure some level of replicability across studies. Thus I treat classification as a kind of operational definition that helps us see the tendencies in the use of tense-aspect markers in relation to verb semantics, without assuming that learners have such semantic representation. (Shirai 2007:59)

While Shirai's "agnostic" position seems indeed reasonable in the light of currently used research methodology in the AH and DH framework, I hope that with multiple focus designs such as those suggested above, future research might be able to shed more light on learner's semantic representations. It has to be admitted, however, that such designs would be rather complex and time-consuming. Unfortunately, practical constraints (such as financial and time-related constraints) often restrain research studies and thus force researchers to remain agnostic about some of these issues. The current study had to limit itself to one research perspective as well. For reasons of comparability with the large body of studies in both frameworks, I chose an L2 perspective on the data and operationalized the coding procedure with the help of the diagnostic tests suggested in Bardovi-Harlig (1998, 2000) and elsewhere, refined the aspectual categories, and added two categories to the analysis of grounding.

Regarding this discussion, it has to be borne in mind that the two hypotheses on the distribution of verbal inflections in learner language were created on the basis of the observation of a distributional bias which is different from the target language.[25] In this context, it is particularly important that in fact, each framework contains *two* aspects of learner hypotheses: firstly, about the boundaries of the lexical or grounding categories, and secondly, about the distribution of the verbal inflections with respect to these categories. As the latter concerns a distribution which is characteristic for early SLA and in effect violates the patterns of the target language, it explicitly sets itself apart from the target system, thus reducing the risk of a comparative fallacy.

As argued above, whenever a pre-established category, such as categories of lexical aspect and grounding, is applied to learner data, the result will have a selective focus, and it logically follows that no objective claim can be made about a learner's interlanguage hypothesis. But this does not mean that the effects we observe in the analysis are non-existent. It is therefore important to differentiate between describing a phenomenon and interpreting the cognitive reasons for it (Schumann 1984). While the research setup used in this study gives us the tools to legitimately describe the effects observed in the data set with regard to the correlation between inflections and categories, it does not provide the means to make claims about the interlanguage reasons for this correlation. Thus, I will argue, with Shirai (2007), that the results will indicate "tendencies in the use of tense-aspect markers in relation to verb semantics," but it can and will not be claimed that these tendencies provide sufficient proof for the learner's interlanguage hypotheses.

3.2.3. Coding lexical aspect

For reasons which will become clear later on in this study, it is important to first conduct an analysis of lexical aspect before determining the grounding pattern in the child narrations. In order to do so, several diagnostic tests have been suggested in the litera-

25 For this reason, Mitchell & Myles (2004) list the AH among the functional approaches to second language research, which, as can be inferred, have overcome the comparative fallacy: "Rather than making the formal linguistic system their starting point, these researchers are centrally concerned with the ways in which second language learners set about making meaning" (2004:132), stressing that "the consensus … that 'form precedes function', that is that morphological forms appear in interlanguage ahead of any recognizable functional contrast in their use, reflects implicit acceptance of the at least partly autonomous nature of formal systems" (2004:155). While this is true for the functional contrasts of grammactical tense and aspect in the target language, which the AH has indeed overcome by taking interlanguage principles based on lexical aspect into account, it has to be differentiated from the more fine-grained perspective on contrasts between the aspectual categories. As the latter are (in most studies still) operationalized with the help of tests based on the target system, the L2 perspective cannot be rejected entirely for the AH framework.

ture. Those tests which were found relevant to the data were used for the coding procedure (Table 3.3).

Aktionsart	Test	Class.	Example
STA vs. ACT	*still*	STA	*The boy is still loving the frog
		ACT	The boy is still looking at the frog
	pres. perf. progressive	STA	*The boy has been loving the frog
		ACT	The boy has been looking at the frog
ACT vs. ACC	*in + X time*	ACT	*The boy ran in ten minutes
		ACC	The boy ran to the forest in ten minutes
	for + X time	ACT	The boy ran for ten minutes
		ACC	*The boy ran to the forest for ten minutes
	toward + for X time	ACT	The boy ran toward the forest for ten minutes (cf. Jackendoff 1992)
	almost	ACT	The boy almost ran (= he didn't run)
		ACC	The boy almost ran to the forest (= ambiguous: he either didn't run or he didn't finish)
	stop + part	ACT	The boy stopped running (= he did run)
		ACC	The boy stopped running to the forest (= he didn't finish)
ACC vs. ACH	*still*	ACC	The boy is still running to the forest
		ACH	*The boy is still falling down (in the pond)
	pres. perf. progressive	ACC	The boy has been running to the forest
		ACH	*The boy has been falling down (in the pond)
	stop + part.	ACC	The boy stopped climbing on a tree
		ACH	*The boy stopped falling down (in the pond)
	almost	ACC	The boy almost climbed up the tree (= ambiguous: he either did not climb or did not reach the top)
		ACH	The boy almost fell into the pond (= he didn't fall)
	while + progressive	ACC	While the boy was climbing on the tree (sth. else happened)
		ACH	*While the boy was falling in the pond (sth. else happened)

Table 3.3: Diagnostic tests for lexical aspect that have been found relevant to the data, adapted and modified from Bardovi-Harlig 1998, Bardovi-Harlig & Bergström (1996) after Vendler (1957), Dowty (1979) and Mittwoch (1991)

The tests were mainly adapted from Bardovi-Harlig (1998:508) based on Bardovi-Harlig & Berström (1996), who compiled them from different influential discussions about the status of lexical aspect (e.g. Vendler 1957, Dowty 1979, Mittwoch 1991), expanded, and annotated with example clauses which actually occurred or which might occur in the narratives. One test was added to the list. One word of caution is in order, though, when such tests are applied to the data:

> Exceptions and borderline cases can be found for nearly all of [the tests] … the use of language specific criteria to determine membership in universal categories is always a bit dubious. Particularly tests which rely on grammaticality judgements … may tell more about the restrictions on linguistic co-occurrence phenomena in individual languages (like English) than serve as reliable indicators of underlying semantic categories (after all, the semantic notions under investigation here need not be the only factors which determine grammaticality configurations). (Housen 1995:47)

The following sections will illustrate such cases.

3.2.3.1. States versus activities

The tests distinguishing STA from ACT mainly involve the grammatical compatibility with the progressive form. This issue is, however, controversial at least to some degree. Comrie (1991:35) holds that states cannot appear with the progressive "since this would involve a contradiction between the stativity of the verb and the nonstativity of the progressive." Nonetheless, he concedes that different languages may have different judgments about the status of stativity in equivalent cases. Although one hypothesis of the AH posits that "[p]rogressive markings are not incorrectly overextended to statives" (Bardovi-Harlig, 2000: 227), Shirai cautions that

> [e]ven here we should be careful about the use of 'incorrectly'. As is often pointed out, stative progressive is possible with stative verbs, and it is not easy to draw the line between correct and incorrect uses. Furthermore, this pattern does not always hold for L2 (Andersen and Shirai, 1994). (Hypothesis (4) was originally proposed for L1 data by Bickerton (1981) and others, and was summarized in Shirai (1991). In fact, Shirai's (1994) study falsified this hypothesis for L1 acquisition.) (Shirai 2007:53)

Especially in spoken English the use of the progressive form with STA cannot be denied. Recently the slogan of a well-known fast food chain, "I'm loving it", which expresses a very strong feeling of enjoyment, seems to have become omnipresent not only in English-speaking countries.[26] Thus, from the point of language use by native speakers, this distinction has to be relativized. What is important, though, is that the use of the progressive with STA is much rarer than with ACT. What we observe in the target language is consequently a strong prototype effect for V-ing with ACT as opposed to STA, and this effect is the focus of the diagnostic test. It becomes evident in

26 A *google*-search on Aug. 7, 2008, yielded more than 24,000 entries for "I'm loving it" and over 1400 for "I was loving it"; I thank Edward Martin for helpful comments on this issue.

this example that the prototypical nature of the categories is reflected in the applicability of the diagnostic tests as well. Accordingly, notwithstanding these straightforward tests, there are cases in the data in which the analysis seems ambiguous.[27]

3.2.3.2. Activities versus accomplishments

The distinction between ACT and ACC, both involving a time span of some duration, relies on tests which aim at the goal or endpoint of this duration. An ACT is a homogenous process that can be decomposed into smaller time spans during each of which the same action is carried out: the boy is running during each part of the whole process of running the speaker wants to focus on. This is not true for ACCs, in which the focus lies on achieving the endpoint of the process. For this reason, in tests focusing on the decomposition of this process *(almost, stop)*, ACCs can be decomposed into process and goal, whereas ACTs cannot. The same difference holds for ACCs vs. ACHs. ACHs are punctual by definition, they cannot be decomposed and, thus, cannot yield an ambiguous result when tested for interruption. And like states (in most cases), ACHs cannot take the progressive form indicating a process.

The fact that the distinction between ACT and ACC is sometimes ambiguous can be illustrated by two examples used frequently by the children to encode the story.

a) run away

b) look to / at / in something

The status of *goal* or *endpoint* is not intuitively clear in these two complements. When the boy is running away, does this denote an ongoing process with or without an endpoint, i.e., in a), is the goal implied, given, or non-existent? And does the object to which the gaze of the boy is directed represent the endpoint of the gaze, and is thus telic, or not? In these two cases, the analytic tests provide an answer. In a), at least one of the tests reveals an ACC:

Test questions:

The boy ran away for ten minutes	(=?)
*The boy ran away in ten minutes	(= –)
The boy stopped running away	(=?)
The boy almost ran away	(=amb.: he did not run away or he did not "finish", i.e. he did not really get away ✓)

whereas in b), they clearly render an ACT verb:

The boy looked in the glass for ten minutes	(=✓)
The boy almost looked into the glass	(=unambiguous ✓)
The boy stopped looking into the glass	(=he did look ✓)

27 This is the reason why other authors have subdivided their categories differently from the classification used by Vendler (e.g. Jackendoff 1992, Pustejovsky 1992).

Interestingly, the number of applicable test questions seems to indicate a gradual distinction between prototypical and ambiguous examples of a category, a phenomenon to which I will return later.

3.2.3.3. Accomplishments versus achievements

The major difficulty in coding ACC versus ACH lies in the notion of punctuality. The literature defining these aspects naturally presents prototypical cases which incorporate definitely punctual semantics with ACHs, and a clear duration with ACCs. Problems arise, however, with less prototypical cases which merge the fuzzy edges of point vs. process, respectively: the more extended the notion of punctuality, and the shorter the period of duration, the more ambiguous the coding decision will become. The punctuality of verbs like *reach, notice,* and *stop* is prototypically inherent to the meaning of the verb. Verbs which indicate an extremely short duration, like e.g. *blink,* are pragmatically and without much hesitation treated as punctual as well. (Their punctuality is also proved by the fact that an already small indication of duration turns them into iteratives: "He blinked for a few seconds" does not refer to just one movement of the eyelids.) However, not all verbs incorporating a seemingly minute duration behave like this in all cases. Again, these distinctions rely on the semantics of the clause. Take e.g. the sentence "The book fell on the floor." Any reference to the duration "The book was falling on the floor" sounds either rather odd or even evokes the image of a slow-motion in a movie scene, which slows down the process of falling in order to make sense of the progressive. But what happens if "falling" is complemented by "from the window on the ground" or "from the top of the tower"? In these cases, the duration is much longer, and the progressive seems more appropriate. It is for this reason that the test question *while + progressive* has been added to the list.

*While the dog was falling down, the boy looked to the frog.

?While the boy was climbing on the rock, the dog found the bees.

While the boy was climbing on the tree, the dog found the bees.

Although this does not represent a logically conclusive solution to the problem, the contrast with another event happening at the same time pragmatically helps resolve the process / nonprocess meaning in the example at hand. For this reason, the dog falling down from the windowsill was classified as ACH, whereas the boy's climbing on the tree was seen as an ACC. (In this example, it does not help the matter that "climb on the tree" can refer to the rather short beginning of the climb, i.e. getting on the lowest branch, or the process of climbing further up into the branches or even of reaching the top of the tree, which would represent the clearest case of ACC meaning.) Some forms even take an iterative meaning when complemented with *while*, e.g. *while the dog was jumping at the bees* clearly refers to an action consisting of repeated jumps. If this happens, it is seen as a clear indication for ACH classification.

Jackendoff (1992:32ff) conceptualizes this problem with reference to spatial relations in trying to capture the notion of *boundary* semantically. He specifies that boundaries take different dimensions with different kinds of objects. "The end of a line" represents a different kind of boundary from the dimensions of "the edge of a table." This is a rather straightforward geometrical representation. The puzzle emerges, however, with someone cutting "the end of a ribbon" or putting their cup "on the end of the table." Here,

> the end of the ribbon includes the geometric boundary plus some pragmatically determined but relatively small part of the body of the ribbon […] These examples show that the primary dimension of an end […] can be expanded a small amount along the axis. […] This notation may be thought of as something more than a point but something less than a line. (Jackendoff 1992:33)

This pragmatic solution, he says, also helps explain the logically puzzling use of the progressive in "Fred is ending/finishing his talk". As Jackendoff points out, "[t]he solution lies in the optional expansion of the end some small pragmatically determined distance back into the talk" (p. 34). With respect to the coding of aspectual categories, it is this pragmatically determined "optional expansion" which constitutes the difference between a prototypical and an ambiguous case.

Another doubtful case is the classification of verbs introducing utterances. Dry (1983) classifies them as ACCs, whereas Bardovi-Harlig (2000) uses an ACH classification. The coding difference probably relies on whether the duration of the utterance is integrated as a complement in the interpretation of lexical aspect or not. As Bardovi-Harlig (2000) was taken as the main reference for this study, verbs introducing direct speech such as *call*, *cry*, *say*, *shout*, etc., were classified as ACH to increase the comparability between the studies. This interpretation is corroborated by the use of the tests in Table 3.3:

Test questions:

*the boy has been shouting "Frog where are you" (=✓)
?*the boy stopped shouting "Frog where are you" (=iterative?)
the boy is still shouting "Frog where are you" (=iterative ✓)

3.2.3.4. Lexical aspect in discourse

Until now, the main focus was on predicates and their arguments within a single clause. I will argue that, as has been pointed out before (e.g. Dry 1983), lexical aspect is not only shaped by clause complements but also by the structure of the narrative in which it is embedded. This is illustrated by the following examples.

The boy sees the frogs.

The boy climbs over the log

and then he sees the frogs.

Whereas in the first proposition *see* is usually classified as a STA, the short narrative poses a serious coding problem: embedded in a sequential event structure, *seeing the frogs* cannot be classified unambiguously as an unbounded STA anymore, since the coming about of *seeing* does not extend to the preceding event, but is merely initialized by its closure. As many solutions as STA, ACT, and ACH have been proposed for its classification. This discussion dates back to the philosophical approaches of Ryle (1954) and Vendler (1957). Vendler, who uses *see* as a prototypical example of STA, claims that the sudden beginning of a state verb rather has the quality of an ACH. Discussing the verb *know* in both senses, he shows that they are related "as getting married (achievement) is to being married (generic state)" (1957:153). The result of knowing something in an ACH sense is the permanent knowledge of it in the STA sense; thus ACHs may mark the beginning of either activities or states. Likewise, Ryle (1949, 1954, quoted in Vendler 1957:154), has argued that the temporal structure of *see* denotes neither an ACT nor a STA but rather a success similar to ACH terms. Others have even opted for an ACT value (Sibley 1955, quoted in Vendler 1957:154). In response to this, Vendler maintains that the "spotting" sense of *seeing* (comparable to the "understanding" sense of *knowing*) unquestionably represents an ACH, independent of the continuous state of seeing an object after having spotted it. "Thus "seeing" is an achievement initiating the generic state of seeing" (p. 158). The use of the English progressive, according to Vendler, rules out the option of *seeing* as a process, complemented by the fact that being able to see is nothing which could be done or performed for any period of time.

This, however, leads to the question of whether any such STA (or ACT, for that matter) can be classified as a STA at all *when positioned within the sequence of a narrative.*

> Of course, states can also start, and cease. The start or end of a state is dynamic, since for a state to be started or stopped something must come about to bring about the change into or out of this state; this follows from the definition of state given above. Thus when, in section 1.1, we noted that states can be referred to by forms with perfective meaning, then the form describing the state here refers not only to the state, but also to its inception and termination … i.e. do include a dynamic element. (Comrie 1991:50f)

According to this line of argumentation, the sequencing of events would, in all situations, indicate the beginnings of the respective STAs and ACTs in an ACH sense, because, by the sequenced order of events, at least one of the two boundaries is determined: the end of *climbing over the log* determines the beginning of *seeing the frogs,* as it would determine the beginning of any state or process which follows after the preceding event. And if another event follows afterwards, it may even mark the end of the activity (although not necessarily, as we will see later).

> Several authors use the criterion of ±Bounded as the starting point for the characterization of situations (Bhardwaj et al. 1988; Klein et al. 1993; von Stutterheim 1986; Sasse 1991; Breu 1988). This notion seems to have no immediate equivalent in Vendler's original model. Every situation is said to have, in principle, a potential starting point or

> left boundary, a potential temporal duration and a potential endpoint or right boundary. These boundaries are actually 'changes of situation' which enclose the 'actual' situation (Sasse 1991). The left boundary marks the change or transition from the preceding situation and the right boundary marks the transition to a new situation. What lies in between the two boundaries is so to speak the situation proper. Some situations are characterized by the fact that their intermediate phase is conceptually more important than their two boundaries (e.g. *know the answer*). With others the right boundary may take on a greater relevance (e.g. *find the answer*). The notion of left-boundedness seems universally of lesser importance -linguistically and probably also conceptually- than right-boundedness (cf. Bhardwaj et al. 1988:27) to the extent that it is less often and less systematically marked at the level of bare predication. An operational definition of the concept of boundary is provided by von Stutterheim (1986: 62-3) …
>
> The notion of *situation boundaries* allows for a principled definition of the criteria ±punctual and ±telic and of the resulting situation/predication categories: A situation is punctual if its intermediate phase is (quasi) nullified. This occurs when the left and right boundaries conflate, or when either the left or the right boundary is emphasized to the point that the entire situation is reduced to that particular boundary. Emphasizing the intermediate phase of a situation renders a situation durative. Finally, a telic situation can be defined as one which has a prominent right boundary; otherwise it is atelic. The feature ±stative, which is only marginally temporal, cannot easily be defined in terms of situation boundaries … (Housen 1995:47f)

This characterization by Housen refers to situation boundaries with the sole focus on the lexical category. However, in a discourse context, another determining boundary is added through the preceding and the following events. As argued above, STA, which "cannot easily be defined in terms of situation boundaries", may take on a beginning or end point depending on their position in the context.

This discussion shows how intricately lexical aspect is interwoven with the structure of a narrative, notably the foreground, which indicates the sequence of events that move forward chronologically. The immediate question, given the discussion above, is how to code these examples in the data. One approach to this problem is given in Dry (1983:27), who suggests to account for the *inceptive* aspect of beginning STAs and ACTs, i.e. "a beginning (or ingressive, inchoative, inceptive) phase, which follows the left boundary" (Housen 1995:51). Jackendoff (1990, 1992) systematizes this idea within his semantic framework as a treatment of the inchoative function of argument structure. This function, treated as a conceptual primitive in Jackendoff (1990) but reanalyzed into a bundle of features including +/-bounded in 1992, maps states into events by adding the aspect of "beginning of State" to the predicate. Thus, the stative meaning of the sentence

> The weathervane pointed north.

is rendered into an event meaning through the addition of a temporal marker:

> The weathervane quickly pointed north.

Jackendoff states that "[t]he relationship between the two readings is intuitively clear: the Event reading describes a change taking place whose final state is the State reading" (1990:75). He formalizes this relationship as

[EVENT] → [$_{Event}$ INCH ([$_{State}$ X])] (pp. 75, 93)

This representation includes the state reading of the verb in the conceptual structure, indicating that the event is not actually punctual but continues after its initiation. Therefore, it captures more of the actual semantics of the verb than the ACH reading proposed by Vendler.

For this reason, in the present analysis states and activities with event character within the foreground of a narrative are coded as STA_i and ACT_i respectively, with "$_i$" indicating the inceptive/inchoative function of the coming-about of a situation. Their function is determined by the relation to the preceding clause in the narrative which determines whether the STA or ACT incorporates a starting point or not.[28] The same holds true in reverse for ACC and ACH in the background of a narrative. They are thus coded as ACC_{-i} and ACH_{-i}.[29]

3.2.3.5. Verbs coded for lexical aspect

Table 3.4 compiles all 154 lexemes used by the children to narrate the *Frog Story*. L1 lexemes are included as they are often used with L2 inflections, such as:

Child 9.1: the Eul *hat*s shut the eyes

Child 7.1: and the boy *ruf*ing the frog

The verb types are listed alphabetically with the particles, prepositions and complements used by the children (no matter if they were target-like or not). The classification according to the diagnostic tests is given in the last column. Lexemes which take different particles or prepositions without changing the category are listed as one type, whereas a change of category through a complement results in two different types, as in:

fly ø, after, behind, *by, in and out, *under ⇨ ACT

fly away ⇨ ACC

28 Lardiere (2003) encountered this problem in her data analysis, but unlike the present study she classified the difference between the two interpretations as a difference between atelic and telic predicates.

29 For reasons of practicability and for the programming of the database count, these categories are expressed in the analysis as STi and ATi, AC-i and AH-i, respectively.

No.	Lexeme	Particle / Preposition / Complement	Aktionsart
1.	*ask*	(direct speech)	ACH
2.	*bark*	at, to	ACT
3.	*be*		STA
4.	*begin*		ACH
5.	*bite*	ø, in, into, *to	ACH
6.	*break*		ACH
7.	*bring*		ACC
8.	*bump*		ACH
9.	*call*		ACH
10.	*catch*		ACH
11.	*carry*		ACT
12.	*climb*	ø, after, *at, beside, on, out, over, up, to	ACC
13.	*climb in*	(the glass)	ACH
14.	*come*	ø, *hoch*, from, *on, out, outside, to	ACH
15.	*crash*	ø, down, off	ACH
16.	*creep*	on, out, up	ACC
17.	*cry*	(direct speech)	ACH
18.	*disappear*		ACH
19.	*do*		ACT
20.	*dress*	*up	ACC
21.	*explode*		ACH
22.	*fall*	ø, down, *for, from, in, into, off, on, out, *up	ACH
23.	*fall asleep*		ACH
24.	*find*		ACH
25.	*finden*		ACH
26.	*fly*	ø, after, behind, *by, in and out, *under	ACT
27.	*fly away*		ACC
28.	*fly on*	(something), back, to	ACC
29.	*fly out*		ACH
30.	*follow*		ACT
31.	*follow out/to*		ACC
32.	*get*	(something, somehow, somewhere), ø, on, up	ACH
33.	*get away*	home	ACC
34.	*get/become*		ACC
35.	*get out*	(of the glass)	ACH
36.	*give*		ACH
37.	*go*	ø, behind	ACT
38.	*go away*		ACC
39.	*go in*	(in the glass, in the hole, in pieces)	ACH
40.	*go out*	(of the glass, the hole)	ACH
41.	*go out/to*	*at, in, into, down, home, near, *of(f), on, *onto, out, outside, over, up, to	ACC
42.	*go to sleep*	sleeping	ACH
43.	*gucken*		ACT
44.	*haben*		STA
45.	*halten*		ACT

46.	*have*		STA
47.	*have a look*		ACT
48.	*hear*		STA
49.	*help*		ACT
50.	*help out*	(somebody)	ACH
51.	*hold*	ø, at, on, for	ACT
52.	*hop away*		ACC
53.	*hop*	out, to	ACH
54.	*hören*		STA
55.	*hunt*	ø, after	ACT
56.	*hunt to*		ACC
57.	*hurt*	(something)	ACH
58.	*ignore*	(child 05.4B.56)	ACT
59.	*join*		ACH
60.	*jump*	ø, after, down, from, on, out, to, up	ACH
61.	*jump (iter)*		ACT
62.	*klettern*		ACC
63.	*know*		STA
64.	*kommen*		ACH
65.	*land*	ø, on	ACH
66.	*laugh*	ø, at	ACT
67.	*laufen away*		ACC
68.	*lecken*		ACT
69.	*let*		ACH
70.	*lick*		ACT
71.	*lie*		ACT
72.	*lift*	ø	ACH
73.	*listen*		ACT
74.	*live*		ACT
75.	*look*	ø, above, at, *after, behind, *by, down, in, into, on, out, outside, over, under, (*)up, to, (somehow)	ACT
76.	*look up*		ACH
77.	*look for*		ACT
78.	*love*		STA
79.	*make*	(a sign, a stop, "bang", *platsch,* splash, something), down, open, up	ACH
80.	*name*		ACH
81.	*nehmen*	ø, *weg*, with	ACH
82.	*open*		ACH
83.	*peck*	at	ACH
84.	**peek*		ACH
85.	*peep*	out, over	ACT
86.	*pick up*		ACH
87.	*play*	ø, with	ACT
88.	*(point)*	to, (*show on)	ACT
89.	*protect*		ACT
90.	*push*	down, from, in, into, out, up	ACH
91.	*put*	ø, on	ACH

92.	*ride*		ACT
93.	*rufen*		ACH
94.	*run*	ø, after, before, behind, beside, in, through, **vor*, with	ACT
95.	*run away*		ACC
96.	*run out/to*	*in, into, to	ACC
97.	*run over*		ACH
98.	*rush out*		ACH
99.	*sagen*		ACH
100.	*say*	(dir. speech), goodbye	ACH
101.	*scare*		ACH
102.	*schnuppern*		ACT
103.	*scream*	(dir. speech)	ACH
104.	*search*		ACT
105.	*see*		STA
106.	*sein*		STA
107.	*set*		ACH
108.	*shake*	ø, *on	ACT
109.	*shake the head*		ACH
110.	*shine*		ACT
111.	*shoo away*		ACH
112.	*show*	*on	ACT
113.	*shout*	(dir. speech)	ACH
114.	*shout (iter)*		ACT
115.	*sing*		ACT
116.	*sit*	ø, by, in, on	ACT
117.	*sit up*		ACH
118.	*sleep*		ACT
119.	*smell*		STA
120.	*smile*		ACT
121.	*sniff*	ø, after, at	ACT
122.	*sound*	like	STA
123.	*splash*	ø, in, into, out	ACH
124.	*split*	into	ACH
125.	*spring*	out, up	ACH
126.	*stand*	ø, around, behind, *by, next, on, out	ACT
127.	*stand up*		ACH
128.	*start*		ACH
129.	*stay*		ACT
130.	*stick*		ACT
131.	*stick into/out*		ACH
132.	*stick out*		STA
133.	*sting*		ACH
134.	*stink*		STA
135.	*stop*		ACH
136.	*suchen*		ACT
137.	*swim*	ø, in	ACT
138.	*swim to*		ACC

139.	*take*	ø, back, home, *off, to, up	ACH
140.	*take to*	home	ACC
141.	*think that*		STA
142.	*think*	(dir. speech)	ACH
143.	*throw*		ACH
144.	*tie*	**an*	ACC
145.	*touch*		ACT
146.	*try*		ACT
147.	*turn on*		ACH
148.	*wake up*		ACH
149.	*walk*	ø, along	ACT
150.	*walk out*	(of the glass)	ACH
151.	*walk out/to*	*on	ACC
152.	*want*	to+inf, sth.	STA
153.	*wave*	(the hand)	ACH
154.	*yell*	(dir. speech)	ACH

Table 3.4: Verbs coded for lexical aspect in the data (STA and ACT are classified as inceptive/inchoative in sequenced foreground clauses, ACC/ACH are classified as -inceptive/inchoative in non-sequenced background clauses, *(lexeme)* * incorrect form)

The following section discusses the coding of discourse grounding.

3.2.4. Coding discourse grounding

Research studies have suggested that the concept of foregrounding and backgrounding of information has to be regarded as universal to human processing, und thus, as is assumed, to human language (e.g. Hopper 1979, cf. section 2.3). The question which arises, however, is whether the universality of this characteristic also implies that all natural languages code the concept of grounding in the same way. The diversity of phenomena in different languages seems to suggest the contrary. It is therefore doubtful whether the same principles of grounding observed in language A can be transferred to language B. Rather, we have to assume that languages use different means to encode the distinction between FG and BG (Bardovi-Harlig 2000).

The second, even more important variation has to do with the individual speaker. Not only do languages contain different mechanisms of encoding grounding, but, within each language community, each speaker can choose an individual way of portraying what s/he thinks is important about the event structure of a narrative. This distinction has consequences for the coding of the data. These are illustrated in the following.

3.2.4.1. Test cases

If one wants to analyze the distribution of verbal inflections (dependent variable) with respect to grounding (independent variable), it is important to first establish the grounding status of each clause in order to observe the use of inflections in the respective context. The dilemma arises, however, when coding a narrative for grounding with the criteria suggested within the framework of the Discourse Hypothesis. Bardovi-Harlig (1998, 2000), Housen (1995), and others, used the test question *What happened next?* to distinguish FG from BG in a story. Clauses which represent an answer to this question are applied event status in the sequence of story events, and are thus classified as FG. Clauses not answering the test question are regarded as BG clauses. This seems like a very straightforward approach, which is illustrated in the following extract from a (fictitious) frog story:

(a) the boy started looking for the frog everywhere, in vain (FG)

(b) he was very sad (BG)

(c) that the frog had escaped in the night (BG)

(d) because he loved his frog dearly (BG)

(e) so, he and his little dog went to the forest (FG)

(f) in order to find their frog (BG)

The two FG clauses are the only ones which answer the test question. They clearly represent the event sequence of the storyline, whereas the other clauses provide additional information which does not propel the events forward on the time line of the story.

However, it is possible to present the story in a different (also fictitious) way:

(a) in the night, the little frog escaped from the glass (FG)

(b) when he woke up (?)

(c) the little boy found out (FG)

(d) that the frog was not there (BG)

(e) he was very sad (?)

(f) he looked for the frog in his clothes (FG)

(g) and the little dog looked for the frog under the bed (?)

This extract basically relates the same events as the first example in that it refers to the same pictures, but different details have been extracted and ordered in a different manner. It becomes obvious that the classification of grounding is much less straightforward than in the preceding narration. The question marks indicate clauses with uncertain status with regard to the test question.

These clauses represent different problems to the theory of grounding as proposed by research within the DH. Example (b) represents an event which happens in sequence with the other events *(escape – waking up – finding out)*, but linguistically it

is depicted differently from the preceding and the following event. As a matter of fact, some studies (e.g. Housen 1995) code *when*-clauses as BG clauses in general. In example (e) one could argue both for a stative or for an inchoative reading of *was very sad*. And in example (g), finally, a simultaneous event is depicted (simultaneity is considered a BG feature), although it is an event which pertains to the second main character whose actions are chronologically sequenced in the story in the same way as the main character's. These problems will be discussed in the following (section 3.2.4.3).

These issues pose a serious problem for the coding procedure. With respect to the test question *What happened next?*, the coder has to decide what is more important: to pay attention to the chronological sequence of the events, or to the linguistic means with which the sequence is encoded. In other words, the answer to the test question can be given on two different levels: Either, we can decide whether a specific event propels time forward. This would answer the question of whether the event is in chronological sequence with the preceding event *in the story's time line*.[30] This level only takes the text into account, irrespective of the speaker's intentions. Or, one could ask whether the speaker *encodes* a certain proposition *as being in sequence* with the preceding event. This would, however, yield a different kind of result in the analysis of the examples b) and e). The dilemma becomes obvious e.g. in Dry's (1983) and Thompson's (2005) analysis of *when*-clauses.

> When he came to a third big creek, he stopped to have a swim
>
> ("Beginning Place", p. 65, taken from Dry 1983:38)

> When Mary came in, John left the room.
>
> John left the room, when Mary came in.
>
> (taken from Thompson 2005:72)

From both points of view, the chronological sequence and the linguistic encoding, it is obvious that the status of the subordinate clause differs from that of the main clause in both examples. All main clauses in these examples represent events which move the narration time forward. The question now is whether this is true as well for the subordinate clauses. Authors like Housen (1995:261) account for subordinate *when*-clauses in general as BG clauses. Dry (1983), however, argues that *when*-clauses can incorporate perfective aspect and thus are able to propel time forward in the same way as main clauses do. In the example above, she argues that the first event of coming to the creek precedes the event of stopping to swim. Coming to the creek is thus a prerequisite for the following event. Dry concludes that both clauses represent events in the narrative

30 Interestingly, this is the researcher's interpretation which is in focus, and the universality of such interpretations would have to be tested. The question remains whether all readers have the same "impression about time movement" (Dry 1983) when analyzing a clause.

sequence.[31] Thompson (2005) goes a step further in her analysis and points out that the sequential reading of *when*-clauses, as in *When Mary came in, John left the room*, depends on its syntactic structure: the non-simultaneous reading of *When Mary came in, John left the room* results from the initial position of the temporal adverbial, whereas non-initial *when*-clauses as in *John left the room when Mary came in* always trigger an ambiguous reading between sequentiality and simultaneity.

How can this puzzle be resolved to establish the grounding categories in these examples? I would argue that on the level of the event structure of the text, the initial *when*-clauses in these examples indeed move time forward. Thus, given that chronological sequence is a defining feature of the FG, they should be classified as FG, contrary to Housen's analysis. But this would still not account for the way *the speaker depicted* this event: a *when*-clause definitely differs from events depicted in a main clause. Did the speaker indeed intend to foreground this information by relating it through a *when*-clause? After all, s/he could in fact have chosen a different, an unambiguous kind of presentation for a FG event. Intuitively, these clauses do not have the same status as other, unambiguous FG examples. But what is the consequence? Is the information of Mary's coming into the room to be regarded as BG? Does it have the same BG status as the second subclause in:

When Mary came in *because she wanted to meet John*, John left.

I would argue that there is a difference in grounding status between the two subclauses. The *because*-clause intuitively represents a clearer case of BG than the *when*-clause. But what does this mean for the grounding status? Is *when Mary came into the room* a sequenced event with neither FG nor BG status?

There is one conclusion which can already be drawn from this example: contrary to what has been proposed as definition for FG earlier, chronological sequencing is not a binary phenomenon, and as such it does not present a sufficient condition for the analysis of grounding. The following sections pick up on that question and suggest a preliminary solution to the problem.

3.2.4.2. The grounding continuum

The examples above illustrate that grounding is a highly controversial phenomenon and that the term *foreground* is by no means unequivocally defined. A clear definition is, however, indispensable for the coding procedure of an empirical study. Despite the risk of complicating the analysis further, I think that it is necessary to refine the defini-

31 This is actually only the case with telic predicates. I would argue that ACT in *when*-clauses do not behave in the same manner; in such cases, *when* can be interpreted as *while* and expresses simultaneity rather than sequence. With this interdependence, however, the analysis of lexical aspect and grounding runs the risk of circularity (see below).

tion for the terms *foreground* and *background* and to use a more fine-grained subdivision to account for the problems above.

It has been pointed out before that grounding is not a binary phenomenon. Some authors refer to it as a "cluster concept" (Bardovi-Harlig 1998, 2000), as a "spectrum" (Hopper 1979, Longacre 1981) or as a "many-layered phenomenon" (Reinhart 1984, Dry 1981, 1983). In accordance with these approaches I suggest that grounding represents a continuum whose poles represent prototypical examples of FG and BG, respectively. Remaining within the metaphor of prototype theory (Rosch 1973, cf. section 2.2.2.2), the *fuzzy edges* of FG and BG reach into the body of the continuum (much like Jackendoff's *end of the table* reaches into the body of the table) towards the other pole.

Figure 3.1: Foreground – Background continuum

A continuum approach is able to account for coding differences in several studies: it elucidates that the dividing line between FG and BG has been drawn at different points in the continuum, taking different linguistic features of the cluster as defining features for classification. This explains the uncertainty about the classification of the *when*-examples above. Subordinate clauses usually contain features which belong closer to the BG (in other words, the prototypical subordinate clause does not express sequentiality), whereas the sequencing expressed in the event of the *when*-clause is closer to the prototype of the FG in the continuum. Everything in the analysis of grounding thus hinges on the interpretation of these clusters. As a consequence, applying such prototypical cluster concepts like FG and BG to the data in a binary fashion might dilute the actual grounding strategies used by a learner. For this reason, a refined segmentation will be suggested below, which might be able to account more precisely for the grounding phenomenon.

3.2.4.3. Focus

In the examples above I showed that a sequenced subordinate *when*-clause may still depict the event as being on the time line of the narration. Undoubtedly, however, the speaker puts less *focus* on the content of the subclause than on that of the main clause. This is also the explanation for the two different classifications by Dry and Housen:

Dry relies on the *sequence* of such *when*-clauses for her FG classification, whereas Housen relies on the *focus* when classifying them as BG.

For this reason, I used an additional category for data coding in the present study, which I call *reduced focus*, and which is depicted in the data as ¬FOC (in the analysis simply FOC). Table 3.5 shows some examples for such classifications from the data.

Child	Clause	Grounding
Child 06.1	and then the dog are running away **and the boy are going over a tree**	FG FOC
Child 01.2	next morning || he wants to say his frog hello || **when the little boy woke up**	FG FOC
Child 03.3	he looked in his boot and the dog goes with his head in the glass	FG FOC
Child 01.4	**when the boy started to sleep** the frog jumped out of the glass	FOC FG
Child 06.4	and the boy felled from the head of the deer and down the cliff **and the dog also felled into a pond**	FG FOC

Table 3.5: The grounding category of *reduced focus* ¬FOC (sequenced *when*-clauses and second main character); || insertion

The statistical analysis in section 5 will reveal whether there is indeed a difference between ¬FOC and the two original grounding categories, and whether the new category will be more similar to the FG or the BG. As both examples of reduced focus, i.e. certain *when*-clauses and simultaneous events of the second main character, actually contain sequenced events on the time line, it is expected that the FOC category behaves similarly to the FG. In terms of the grounding continuum (Figure 3.1) this means that FOC is less prototypical than the FG but it would need to be placed closer to the FG than to the BG in the continuum.

3.2.4.4. Ambiguity

FOC was not the only category which needed to be added. In some cases it was not possible to establish one of the three grounding categories at all, since the reading of the clauses remained ambiguous. Consider the following examples from the data (Table 3.6):

Child	Clause	Grounding
Child 06.1	and the boy want to sleep now **and he sleep** and the frog want to go away	FG AMB FG
Child 06.1	and the dog falling down off the window and then he are on the floor **and the boy are angry […]** *denn* [because] the dog are falling down mit the glass	FG FG AMB BG

Child 03.3	and shouted	FG
	frog, where are you? [dir]	---
	and the dog is by a beehive	AMB
Child 13.4	then the boy was going to the window	FG
	and maked it open	FG
	and shouted	FG
	frog, frog, where are you? [dir]	---
	and the dog sits on the windowsill	AMB
	and wants to be free from the glass	BG
Child 16.4	a boy named Bill and his dog Barcardi looked at the glass jar within a frog	FG
	because it was evening	BG
	they slept in their bed	AMB
	then suddenly the frog jumped out of his glass jar	FG
Child 17.4	and then Fiffi came	FG
	and he had many bee-stucks	BG
	and Max stands on a stone	AMB

Table 3.6: The grounding category of *ambiguity* AMB

All of the predicates in Table 3.6 are STA or ACT. Because of missing information from the context, it is not possible to establish whether the meaning of the predicate is inceptive or not in either of these cases. In the first example:

Child 06.1

and the boy want to sleep now
and he sleep (AMB)
and the frog want to go away

the AMB clause *and he sleep* could be interpreted either as *and then he slept* (FG) *and the frog wanted to go away*, or likewise as *and while he slept* (BG)*, the frog wanted to go away*. Without any other linguistic cue, the difference between a foreground and a background reading of such a clause cannot be established. Consider the second example:

Child 06.1

and the dog falling down off the window
and then he are on the floor
and the boy are angry […] (AMB)
denn [because] the dog are falling down mit the glass

In the story, the dog fell from the windowsill with the glass on his head and the glass broke when he fell to the ground. The boy's anger could now be interpreted either as inceptive STA, which came about as a direct result of the broken glass (sequential FG reading), or as a BG description of the boy's feelings, which are described as simultaneous with the dog's being on the floor. Likewise, all the other examples in Table 3.6. allow for both a FG and a BG reading.

What is common to all those examples? All of them contain atelic predicates, i.e. a sequential reading of the clause is not pre-imposed by the semantics of the predicate itself. Telic predicates do not create such ambiguity, as they already incorporate the boundedness of the situation. If the first example contained a telic predicate such as *wake up*, this would yield an unambiguous FG reading:

and the boy want to sleep now
and he **wake up** (FG)
and the frog want to go away

The second characteristic is that these clauses lack other clues to the status of sequentiality. The most important devices are temporal adverbials which express sequence or simultaneity (see the first example of Child 06.1). It is common to all AMB clauses that they lack such information. These clauses are either paratactic, or they are connected by *and*, which does not carry any temporal information.[32] Other clues are missing as well, such as the context, i.e. the pictures: if events are depicted in different pictures, this suggests that they happen chronologically. The problem arises only when the events are displayed in the same picture. Then it is up to the narrator to depict them either as simultaneous or as sequential. Another clue for sequentiality would be the focus on the character: if the child relates a series of events which involve the same character, one naturally deduces chronological order even if there is no other information on the relation between the clauses. The example of Child 03.1 illustrates this:

Child 03.1

the dog fallding of the boy [sic]
the dog sitting of the boy
the dog sitting of the tree stem

Without any additional information, these events are interpreted as three chronological actions of the dog, which is actually related in the pictures as well: he first falls on the boy, then he sits on the boy's neck, and then he sits on a log in the pond. This phenomenon has been called the *Principle of Natural Order* (e.g. Dietrich et al. 1995, cf. section 2.3). In contrast, AMB clauses usually contain a shift of focus to another character. In that moment, the reader/listener has to interpret whether the event with the second character takes place simultaneously with or after the event with the first character. Without any kind of information either from the context, from the pictures, from the inherent aspect of the predicate or from the linguistic surrounding, it is impossible to make this distinction.

32 The connector *and* may actually carry temporal information, i.e. it may be used by the speaker to indicate a temporal sequence. But what is important here is that *and* does not contain such inherent information a priori, and so it cannot be used to interpret the temporal relation between clauses. This is different with genuine temporal adverbials such as *then*, *while*, or *afterwards*, etc.

The category AMB has thus been added to the list of grounding categories for data coding. This reduces the risk of coding errors for unclear cases such as those defined above. However, due to the very small numbers of AMB clauses (22 tokens / 10 types in Group 3 were the highest numbers of AMB clauses within one group), the category was not included in the final analysis.

3.2.4.5. Circular coding

Having thus established the criteria for narrative sequencing in this study, it is necessary to address a final pragmatic dilemma of the analysis. As Housen points out:

> Also in the coding of foreground and background it was often hard not to be influenced by the morphological form of the predicate. Clauses containing *Ving* forms strongly impose a background interpretation, while *Ved* and *Ven* forms (too?) readily suggest a foreground reading … However, also here it is important to establish grounding status independently from verbal morphology to avoid circularity of analysis at later stages. Furthermore, the coders were inclined to treat clauses with stative, durative and atelic predicates almost automatically as background clauses, and dynamic/punctual/telic clauses as foreground clauses. It is not clear whether this is legitimate. It may well be a natural outcome of the structure of narrative discourse but it may also be an artefact of the way the foreground-background distinction has been operationalized: the question *And what happened next?* is more likely to point to clauses expressing accomplishments, achievements or punctual activities than clauses expressing states (which often do not really *happen* but *are*). Attempts to control for the surreptitious effects of these biasing factors may not have been very successful. For instance, the coding of narrative passages which had previously been stripped of all morphological markings produced quite divergent results between individual coders (also intra-coder reliability was low).
>
> Given the small number of narrative clauses that could be retained for analysis, and given the immanent danger of multiple circularity in the operationalization of the relevant variables, a further analysis of the relationship between the foreground-background distinction and inherent aspect had to be suspended. This is regrettable since such an analysis is recommended if not necessary to unambiguously decide between the effects of discourse-functional vs. semantic factors. Nevertheless, this question will have to be left for future research in which more rigorous techniques for operationalizing the various parameters are available. All this once more suggests that a strict function-oriented approach to the analysis of developing form-function relations may not work too well with semantic and discourse-pragmatic domains which are not sufficiently compensated by other than morphological coding devices and which are highly subjective (rather than intersubjective) in nature. (Housen 1995:261f)

This description acutely represents a very problematic issue which was encountered in the coding of the data. It is important to keep in mind that the actual focus of AH and DH is the distribution of verbal inflections. As pointed out by Housen, the dilemma encountered in coding for aspect as well as for discourse is, however, that verbal morphology is part of the defining linguistic cluster for the two phenomena. Yet, in the final analysis, the inflections represent the dependent variable relying on the aspect or discourse structure (the independent variables), respectively. Therefore, it would be

highly unfortunate if they were used, even if only intuitively, for analyzing aspect and discourse. At that moment, the roles of the variables would just be exchanged in the second step and that way the analysis would become circular, which by all means has to be avoided. The examples in Table 3.7 shall serve to illustrate this effect:

Child	Clause	Grounding
Child 07.4	then Paul saw a hole	FG
	and looked in the hole	FG
	and the dog were looking for the bees	AMB (circ.)
Child 10.4	and the bees all came out	FG
	the boy don't knew it now	BG
	and crept on a tree	FG
	to look in the hole	BG
	the bee were following the dog	AMB (circ.)
Child 11.4	and the dog wanted to climb up the tree	FOC
	and the beehive was falling down	FG
	and the bees wanted to preek him	FG
	and the boy was looking into a hole of the tree	AMB (circ.)

Table 3.7: Circularity in coding for grounding (if inflection was used as an indicator for grounding, the AMB clauses would be coded as BG)

The clauses in these examples were coded as AMB since they meet the criteria described above: they are atelic, they contain a shift in focus to a different character, and they lack additional information from the linguistic context. The problem which Housen refers to, however, arises with reference to the progressive form used in these examples. If the inflection was taken into account in these clauses, and they were interpreted grammatically, the most immediate interpretation would be a BG reading: the progressive form indicates simultaneity in all three cases. Yet, it is important to avoid such an interpretation for several reasons: First, one cannot assume that the learners have already acquired the grammatical rules of the target-language. In fact, the second sentence of Child 11.4, *and the beehive was falling down*, which is a FG clause according to the coding criteria, contains a progressive form as well. Second, the two hypotheses predict a distribution which is absolutely independent of the grammatical target system and should thus not be mingled with grammatical interpretations. And finally, as already stated, the inflections are the dependent variable in a study on the AH and the DH. As a result, it is indispensable to exclude verbal morphology from the analysis of aspect and grounding in order to avoid circularity of coding.

3.2.4.6. Coding criteria

Having discussed several problematic issues, this section now summarizes the criteria which have been found viable for an analysis of grounding. The main criterion for all grounding categories is sequentiality. However, as has been shown, not all clauses can uncontroversially be coded for sequence. As cluster concepts, the categories of FG,

BG, and FOC can be established through different clues from the linguistic and situational context. Likely candidates for this analysis are the temporal and conceptual structure of connectors and adverbials in combination with the lexical aspect of the predicate. (It is for this reason, as mentioned above, that the analysis of lexical aspect has to precede the analysis of grounding in order to avoid circular coding.) In the definition of AMB clauses, these clues to sequentiality are missing from the context. The following working hypotheses about the effects of linguistic markers have been derived from this discussion.

FG: sequential

⇨ completed (ACC/ACH) and/or inchoative (ACT/STA)

⇨ temporal adverbials and connectors indicating sequence

⇨ no linguistic clues / paratactic structure: same character, no shift in focus to other character, completed or inchoative situations (PNO)

BG: non-sequential

⇨ temporal adverbials and connectors indicating anteriority, posteriority, simultaneity

⇨ adverbials indicating reason, purpose, location, etc.

⇨ atelicity (ACT/STA) and/or lack of inchoativity (ACC/ACH)

⇨ no linguistic clues / paratactic structure: atelic, not inchoative situations

FOC: sequential with reduced focus

⇨ sequenced (completed / inchoative) subordinate clauses (e.g. *when*)

⇨ sequenced (completed / inchoative) simultaneous events with a shift in focus to ⇨ another character

⇨ the completion of the preceding action is not a prerequisite

AMB: ambiguous sequentiality

⇨ atelic predicates

⇨ shift in focus to another character / situation

⇨ paratactic, no additional linguistic or contextual cues as to sequentiality

Table 3.8 summarizes these tentative descriptions. The list is by no means supposed to be final; it is desirable that these criteria will be expanded in future studies. For the purpose of the present study, however, they have proven viable for the four grounding categories.

Criterion	FG	FOC	BG	AMB
sequential	+	reduced	–	?
completed	+ACC/ACH	+ACC/ACH	–ACC/ACH	
inchoative	+STA/ACT	+STA/ACT	–STA/ACT	? STA/ACT
adverbials/connectors	temporal, indicating sequence	(temporal, indicating immediate sequence or simultaneirty)	simultaneity, anteriority, posteriority, reason, purpose, location, etc.	no adverbials/connectors
in paratactic structure:				
focus on character	no shift, same character	shift to different character		shift to different character
completed	+ACC/ACH	+ACC/ACH	–ACC/ACH	
inchoative	+STA/ACT	+STA/ACT	–STA/ACT	?

Table 3.8: Criteria for the coding of grounding

3.3. Summary

The four research questions which this study focuses on are:

1. Do the verbal inflections in the child narratives mark lexical aspect?
2. Do the verbal inflections in the child narratives mark discourse grounding?
3. If so, which of the two effects prevails in the data corpus? How do they interact?
4. Do the data reveal an acquisitional development with respect to aspect marking and grounding over time? If so, what pattern can be found in the narratives?

Based on earlier research results (Kersten et al. 2002, Kersten 2007, Kersten & Rohde 2007, Kersten 2009a), it is expected that the data of the early stages of acquisition will correspond with the predictions of the Aspect Hypothesis and the data of the later stages will increasingly follow the predictions of the Discourse Hypothesis. Coding conventions were adopted from the *Kiel Immersion Project* (section 4.1.1) and earlier studies on aspect and grounding (e.g. Bardovi-Harlig 1998, 2000, Bardovi-Harlig & Bergström 1995, Dowty 1986, Dry 1981, 1983, Fleischmann 1985, Schiffrin 1981), and some conventions were added to this list for the purpose of this study.

The first general problem which emerged in the approach to data analysis was the problem of the coding perspective. Learner data has to be interpreted by the researcher, who runs the risk of influencing the results by the perspective and the methods chosen for data coding. Three perspectives on the data were discussed in this chapter, the *interlanguage perspective*, the *L1 perspective*, and the *L2 perspective*. All of

these perspectives use different methods and focus on different aspects of the data. The *interlanguage approach* focuses solely on the learner's hypotheses about the target language. Introspection was identified as an interlanguage approach, but it was not found to be viable for young children. The second approach which was suggested is an *across-category semantic feature analysis*, which would yield a clearer and more learner-centered view on the categories than traditional approaches. It was argued that all categories of lexical aspect and of grounding represent clusters of semantic features, and that a feature analysis would reveal a more fine-grained picture of the learner's individual hypotheses.

The *L1 perspective* takes into account that learners approach the L2 with preformed conceptual notions transferred from their L1. This perspective is taken when the two language systems are compared with each other to reveal interferences, and when bilingual researchers who pay attention to both the L1 and the L2 semantics code the data. Within this perspective, comparison of the results from clearly and ambiguously coded cases of each category was suggested in order to reveal a stronger prototype effect of each category.

It has been argued that the *L2 perspective* runs the highest risk of the so-called *comparative fallacy in SLA* (Bley-Vroman 1983) in that it pays too much attention to the target language and neglects the learner's interlanguage hypotheses. While this argumentation is certainly valid and important to bear in mind, it was cautioned on the other hand that the L2 perspective should not be neglected at the expense of an interlanguage perspective, since the learners strive to reach the target of the L2. Thus, the influence of the L2 system (the input to the learner) has to be taken into account as well in order to establish a complete picture of the learner's interlanguage. The advantage of an L2 perspective is that of diagnostic tests which compare the learner's interlanguage with the target system. It was argued that such tests render studies comparable to each other and increase their reliability. However, a multiple focus design which combines different methods from all three perspectives on learner data represents the most promising approach to map the learner's conceptual representation of the different categories.

In the following sections, practical suggestions were discussed with respect to the coding of lexical aspect and discourse grounding. Several diagnostic tests for the Vendler categories of *aktionsart* were explained and applied to the data and some ambiguous cases were discussed. It was suggested that the level of ambiguity expressed in the number of inapplicable test questions may serve as an indicator of the prototypicality of the respective predicate. Finally, it was pointed out that lexical aspect in the child narratives cannot be separated from the discourse context. In fact, the linguistic context determines to a high degree whether the predicates can be seen as bounded or unbounded. This issue has triggered some discussion in the literature. Here, it was suggested to add the feature of *inceptive* or *inchoative* aspect to the list, which is necessary to define STA and ACT in foreground clauses. STA and ACT are unbounded by definition. But while they do not necessarily need to be regarded as completed in a

discourse context, they usually are inchoative, i.e. contain a "left" boundary at the moment of beginning, in chronologically sequenced FG situations. For those cases, the categories of STA_i and ACT_i (i = inceptive / inchoative) were added to the list of aspectual categories in the FG, whereas the non-inceptive ACC_{-i} and ACH_{-i} were added as categories occurring in the BG.

The coding of discourse grounding in studies has, so far, relied mainly on the test question *What happened next?* This question turned out to be problematic and needed to be refined in the present study. The first issue which had to be resolved was the difference between the coder's perspective, which focuses on what event happened next on the chronological time line, and the speaker's perspective, which may use different means of relating chronologically linked events. It was argued that these two approaches yield different results with respect to grounding, and that they have been applied differently in earlier studies. As a solution to this problem, the notion of a *grounding continuum* was suggested, according to which the categories of FG and BG represent two prototypical poles on a continuum of features which cluster more or less loosely around the centers. Unclear cases of grounding, which created difficulties in earlier studies, are positioned somewhere in between these two poles. In order to account for such cases, two additional grounding categories were suggested: The category of *reduced focus* (¬FOC) shares many features with the FG, but it pertains to events which are either expressed in a subclause indicating immediate sequence (such as certain *when*-clauses), or to simultaneous but completed events with a shift of focus to another character.[33] The category *ambiguity* (AMB) on the other hand refers to clauses which are impossible to code because the context does not reveal enough information to resolve the ambiguous reading between sequence and non-sequence. Such instances occur in the case of atelic predicates (STA, ACT) which contain a shift in focus to another character without giving any linguistic or contextual information about the status of the sequence. The focal shift to another character makes it impossible to state whether the preceding event is completed or not, which would be a prerequisite for the FG. (Telic predicates would, in the same surrounding, be interpreted as sequenced even without additional information as they already contain the feature +bounded.)

Finally, the risk of circular coding was discussed, which pertains to studies that use verbal inflections themselves as a means to establish grounding. This is especially tempting in the case of the progressive form, which grammatically indicates continuity and is thus often found in the BG of narratives in the target language. It was argued, however, that it is very important to exclude the information carried by the verbal morphemes from the analysis of grounding. Firstly, the two hypotheses do not make predictions about the grammatical use of the inflections (on the contrary, the interlanguage hypotheses are supposed to be non-grammatical with regard to the target language), so that grammatical notions should not be included in the interpretation of the

33 Future research might reveal that it is recommendable to subdivide these two different cases even further.

data. Secondly and more importantly, however, such an approach would devalidate the results. The reason for this lies in the fact that the inflections are the dependent variable in the setup, and the focus of the research question is their distribution with regard to different categories. If the inflections are used to establish these categories in the first place, the effects are corrupted by the resulting circularity of the analysis. For these reasons it is deemed crucial to exclude morphological information from the coding of both lexical aspect and grounding.

4. Data and data analysis

The following sections provide background information for the data analyzed in this study. They give a detailed description of the research methodology, the subjects and data elicitation procedure, the data transcripts and the statistical approach used for the analysis.

4.1. The Research context

4.1.1. The *Kiel Immersion Project*

This study originated within the *Kiel Immersion Project* under the direction of Henning Wode from Kiel University (e.g. Wode 1995, 1998a,b, 1999, 2001, 2003, 2004, Wode et al. 1999). With its focus on language acquisition in immersion institutions, the *Kiel Immersion Project* is the natural continuation of the *Kiel Project* on L2 acquisition (Felix 1978, Wode 1981, Wode 1988/1993) and on early phonological development (Wode 1987, 1989, 1992, 1994) which was started in the 1980s. The *Kiel Immersion Project* aims at monitoring and evaluating a number of immersion institutions in Northern Germany ranging from preschool to high school education (Kersten 2005). Most of these institutions implemented a partial immersion program with the help and under the guidance of Henning Wode. At the time this study was conducted, the project comprised two bilingual preschools, the French-German *Rappelkiste* in Rostock (implemented in 1995), and the English-German *AWO-Kindergarten* in Altenholz, a suburb of Kiel (1996), one recently implemented bilingual branch at the *Claus-Rixen* elementary school in Altenholz (1999), and several secondary schools.

In these institutions, Henning Wode and his research team conduct studies on the acquisition of phonology (Wode 2003, Kersten 2002, Kersten 2008, Piske et al. 2002), the lexicon (Wode 1999, Daniel 1999, Rohde 2005, Rohde & Tiefenthal 2002, Tiefenthal 2009), morpho-syntax (Burmeister & Steinlen 2008, Kersten 2009a, Kersten et al. 2002) and narrative structures (Möller 2006, 2008) as well as on the development of literacy (Burmeister & Piske 2008) and on immersion teaching principles (Burmeister 2006a,b,c, Burmeister & Pasternak 2004, Kersten et al. 2009, Piske & Burmeister 2008), *best practices*, factors relevant to the implementation of immersion programs (Kersten in press, see also Kersten et al. in press) and on humor and interlanguage (Kersten 2009b). Research methods range from quantitative to qualitative approaches including standardized tests, various longitudinal and cross-sectional language assessment measures and participant observation by student research assistants or junior researchers who regularly spend time in the institutions and who, under the supervision of the senior researchers, carry out the field work.

4.1.2. The background of the study

The analysis presented here is part of a larger study which has been carried out in the bilingual elementary school in Kiel-Altenholz. From the year 2000 onwards, several bilingual cohorts have been tested longitudinally from grade 1 through grade 4 in their L1 and their L2 by means of semi-guided picture story narrations (cf. 3.3). L1 and L2 tests were carried out with similar picture stories by the same author involving the same main characters. The elicitation method remained constant throughout all testings. In 1998, in preparation of the study, additional data was collected from an English-speaking comparison group[34] in an elementary school in White Bear Lake, Minneapolis, in the USA. The present study focuses on one part of the data collected within this large study, i.e. L2 narrations.

4.2. The Subjects

The subjects in this study are German children from the first cohort of a partial immersion elementary school, the *Claus-Rixen-Schule* in Altenholz. Throughout elementary schooling, the class received approximately 70% of their instruction in English. This includes all subjects except for German language arts. All subjects were taught by teachers who are native speakers of German and hold a teaching degree in English. The teacher's language proficiency in the L2, although not near-native, is fluent and with only few language errors.

The class comprised 18 children in grades 1-2 and 17 children in grades 3-4, since one boy (Child 09) changed to a monolingual class after grade 2. Most of the children were brought up in a monolingual German context, except for Child 10, a girl who has a bilingual German-Polish background, and Child 05, who has an African father. According to the class teacher, the German language proficiency of these girls did not differ from that of their classmates.

The subjects' prior experience with the L2 varied: 6 children entered the class in grade 1 with no prior contact to English, one girl (Child 05) had been exposed to the L2 since birth through her African father who used English, albeit irregularly, at home, and 11 children had attended a bilingual preschool before entering first grade. The concept of this preschool is based on the *one-person–one-language principle* (Döpke 1992) and employs native speakers of the children's L1 and L2 in each group. This results in an average of 50% of daily input in both languages. However, the input that each individual child received varies enormously. The subjects attended three different bilingual groups within the preschool. Not all three groups were implemented at the same time. Furthermore, the preschool employs an open group system in which chil-

34 The term *control group* is avoided since it implies that all variables except for the dependent variable are kept constant. As this was not possible at the time of data collection in the USA, I prefer the term *comparison group* to indicate that some, but not all of the variables are comparable. These include the grades and the age of the children.

dren are not required to attend activities of their own group but may take part in other groups if they choose to. Accordingly, it is possible for individual children to almost entirely avoid contact with the L2 caregiver or, on the other hand, to receive L2 input throughout the whole day. The most notable example for such behavior are two boys (Children 11 and 18) who were not in fact part of a bilingual preschool group but who sought to take part in every activity offered by the English caregiver of another group. This teacher was particularly popular among the boys since he was the only male teacher in the team and he played soccer with the children. Another factor which is impossible to control for is the input provided at home for several children from the bilingual groups. Child 16 received the most intensive additional language training of all children at home from her mother, an interpreter, throughout her preschool and elementary school years. It is thus impossible to pin down the exact amount of L2 input the children received during their preschool years.

Table 4.1 gives an overview of the subjects' experience with the L2 at the beginning of elementary school.

Subject	Sex	L2 Experience	Preschool Input (Months)	Additional Information
01	m	Bilingual preschool	24	Input at home
02	m	Bilingual preschool	24	
03	f	No prior experience	0	
04	f	No prior experience	0	
05	f	Occasional home experience	6	Father African background
06	f	Bilingual preschool	24	
07	f	No prior experience	0	
08	f	No prior experience	0	
09	m	No prior experience	0	
10	f	No prior experience	0	Bilingual German-Polish background
11	m	Bilingual preschool	(24)	Monolingual preschool group
12	f	Bilingual preschool	24	Input at home
13	m	Bilingual preschool	12	Group was implemented later
14	f	Bilingual preschool	24	
15	f	Bilingual preschool	12	Entered late
16	f	Bilingual preschool	24	Extensive input at home
17	f	Bilingual preschool	12	Group was implemented later
18	m	Bilingual preschool	(24)	Monolingual preschool group

Table 4.1: L2 experience at the beginning of elementary school

4.3. Data elicitation procedure

Data was elicited with the help of a picture story at the end of each school year in grades 1-4, in May 2000-2003. The elicitation procedure was kept constant during all interviews. It was adapted from a study by Housen & Pallotti (1999: 19f)[35] with L2 learners of English in different European countries in elementary school. The main elicitation tool is a picture story which has been used repeatedly for linguistic studies (Berman & Slobin 1994), the so called *Frog Story* (*Frog, where are you?* Mayer 1969). The story tells the adventures of a boy and his dog, who are in search of their escaped pet frog in the woods. It contains 24 pictures involving parallel and sequential events with different characters, i.e. the boy and the frog as the two main characters, and other animals that they meet on their way. The story thus presents sufficiently rich stimuli for the expression of various temporal relations, which are in the focus of this study.

According to Housen & Pallotti's (1999) suggestions, the interview was split into two parts. The first part was carried out by a German-speaking interviewer, the second one by an interviewer whom the children knew to speak English exclusively. Both interviewers were student research assistants of the Kiel Immersion Project and especially the English-speaking interviewer was well-known to the children. The main rationale was to put the children at ease during the first interview, to acquaint them with the story and to provide them with the necessary vocabulary so that they would be able to tell the story fluently and concentrate on the phrasing of the events during the second interview. As a drawback of this procedure, interview A makes a lexical analysis of the data difficult as some of the items are provided by the interviewer. However, this does not influence the morphological and temporal focus used in this study. The precise structure of the interviews is described below.

Interview A

The subject was accompanied by the English-speaking interviewer, who s/he was well acquainted with, to a quiet room where the German interviewer was waiting. The English-speaking interviewer left the room. After some introductory small talk, the German interviewer presented the child with the picture story and explained the task: the child was to look at the pictures and then to tell the story in English. S/he could ask for words because later on s/he would have to tell the story in English to the second, English-speaking, interviewer who did not understand German. Then the child took some time to look at the pictures silently to understand the events in the story. Finally s/he told the story in English. The interviewer provided missing lexemes but no grammatical information. The pictures were shown to both child and adult. Afterwards the child was complimented and the second interview was introduced.

35 This study was carried out by a special interest group focusing on second language acquisition within a series of Euroconferences on *The teaching of foreign languages in European primary schools*. I am especially grateful to Gabriele Pallotti, who provided me with an unpublished version of their elicitation method while the study was still in progress.

Interview B

The German interviewer was replaced by the English-speaking interviewer, who again started with some small talk and then asked to hear the story. Whereas during A the booklet was lying on the table, the interviewer was not supposed to see the pictures during B. The subject was not supposed to ask for words during this part and the interviewer pretended not to understand German questions. If the child needed to be prompted to continue, the interviewer avoided the use of grammatical structures and responded mainly by: *And then? Never mind, just go on*. In the end, the interviewer complimented the child again and offered candy as a reward (which had been agreed on with the teacher in advance).

All interviews were audio- and videotaped. Throughout all interviews, the children cooperated at all times. However, although the test procedure had been piloted in first grade with some smaller picture stories, some children seemed insecure about the task and their own L2 proficiency at first. In these cases the interviewers made intensive efforts to praise the children and to put them at ease so that all of them managed to tell a coherent story according to their abilities in the end. To illustrate the range of variety, the two following excerpts of the transcripts show the difference between a shy and a self-confident subject.

Child 03 (Inexperienced) Grade 1, Interview B	
3	The frog sitting in the glass. # The boy # he's sitting sh/ *hier* # sitting *neben* the glass.
IE	Can you say it one more time? I didn't hear you.
3	He's # s/ sitting on the floor.
IE	Okay.
3	The boy he's very very tired.
IE	Okay.
3	The dog, too.
IE	Mhm.
3	The boy # (turns page) he's oping the # (whispers) *wie heißt das nochmal*? # hm # (the bell rings) he's oping the # he's oping the ### XXX (quietly in German)
IE	Never mind. Just say something else.
3	Mhm. (turns page) The dog fallding of the # floor.
IE	Okay. Mhm.
3	The boy is very very angry of the # dog.
IE	Can you speak a bit louder? I can't hear you very well. [...]
3	the boy is very very angry of the dog.
IE	Okay. Yeah, now I got it.
3	The boy he's # the b/ # dog he's # is very very hungry and # was XXX(falld?)ing (hums) *oh mann, die nächste Seite, die ist blöd* XXX (turns page) [...]

Table 4.2: Excerpt of Transcript Child 03.1B

pause; / hesitation, self-correction; ( ) comment; XXX incomprehensible; *italics* L1 utterance

Child 01 (Experienced) Grade 1, Interview B	
IE	Hey, # 1. I'm curious to hear a story.
1	Yes. The boy have a frog. And the boy is looking at the frog. And in the night the frog is wants to go away. And the boy and the dog is sl/ are sleeping. And now on/ in the morning the boy are s/ is scared because the frog is away. # And the boy is can't seeing the frog anymore. The boy is screaming: "Frog, frog, where you are?" And now the fr/ the dog is looking in a mh bottle and then the dog is falling (laughs) out of the window. And then the boy is jumping. And then the boy has the frog eh/ the dog in he's a/ arms. And then the mh boy is screaming: "Frog, frog, frog, where you are?" # [...]

Table 4.3: Excerpt of Transcript Child 01.1B

pause; / hesitation, self-correction; ( ) comment; XXX incomprehensible; *italics* L1 utterance

These differences decreased, however, during the tests in the following grades.

4.4. Data transcription

The audiotapes of the narratives were transcribed by various members of the Kiel research team and subsequently verified by the author. The videotapes represented a backup for doubtful cases. A coding system was developed especially for the needs of these transcriptions (cf. section 3). The data were transcribed including all hesitations, self-corrections, pauses, L1 utterances, questions and interviewer interjections. If necessary, comments were added.

This study focuses on the data from interview B. For the purpose of the analysis, the detailed transcripts were condensed into clauses containing a subject (if present), the predicate and other complements and/or adjuncts (if present). Interviewer utterances, comments, repetitions of interviewer utterances, identical repetitions of clauses, hesitations, and pauses were deleted. In the case of self-corrections, the corrected version was used and the version the child had sought to correct was deleted.[36]

Table 4.4 shows the number of clauses produced by the children in the four tests. As could be expected, the average of the number of clauses increased with time.

Subject	Grade 1B	Grade 2B	Grade 3B	Grade 4B
01	41	48	58	46
02	19	31	36	30
03	30	39	67	52
04	25	37	46	59
05	22	65	64	74
06	67	77	67	94
07	28	80	78	80

36 Note that this does not correspond to the grammatically correct or incorrect version of the target language.

08	35	62	113	85
09	57	74	-	-
10	18	42	50	60
11	59	57	48	60
12	25	65	64	86
13	28	38	48	69
14	34	59	54	50
15	27	34	48	51
16	43	69	90	71
17	27	42	93	87
18	35	57	74	62
Ø	**34,44**	**54,22**	**63,22**	**66,22**

Table 4.4: Number of clauses used in the transcripts (interview B)

Figure **4.1** gives a visual description of the variation of clause number by grade.

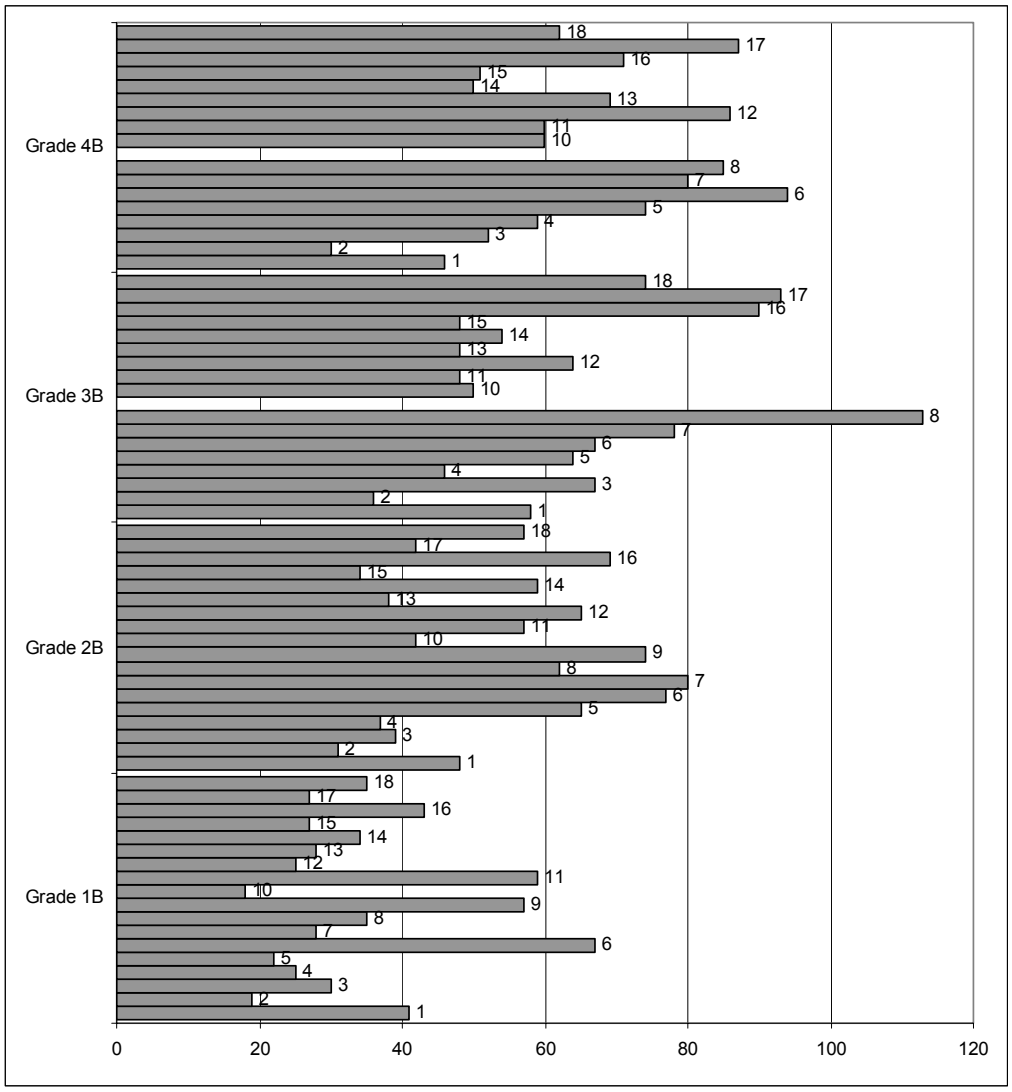

Figure 4.1: Number of clauses used in the transcripts (interview B) by grade; number of subject indicated above columns

However, there is high intra-individual variation in the number of clauses used in the narrations of each child (Figure 4.2). A (linear) increase in the number of clauses represents the exception rather than the rule in the data set (cf. e.g. subjects 04, 13).

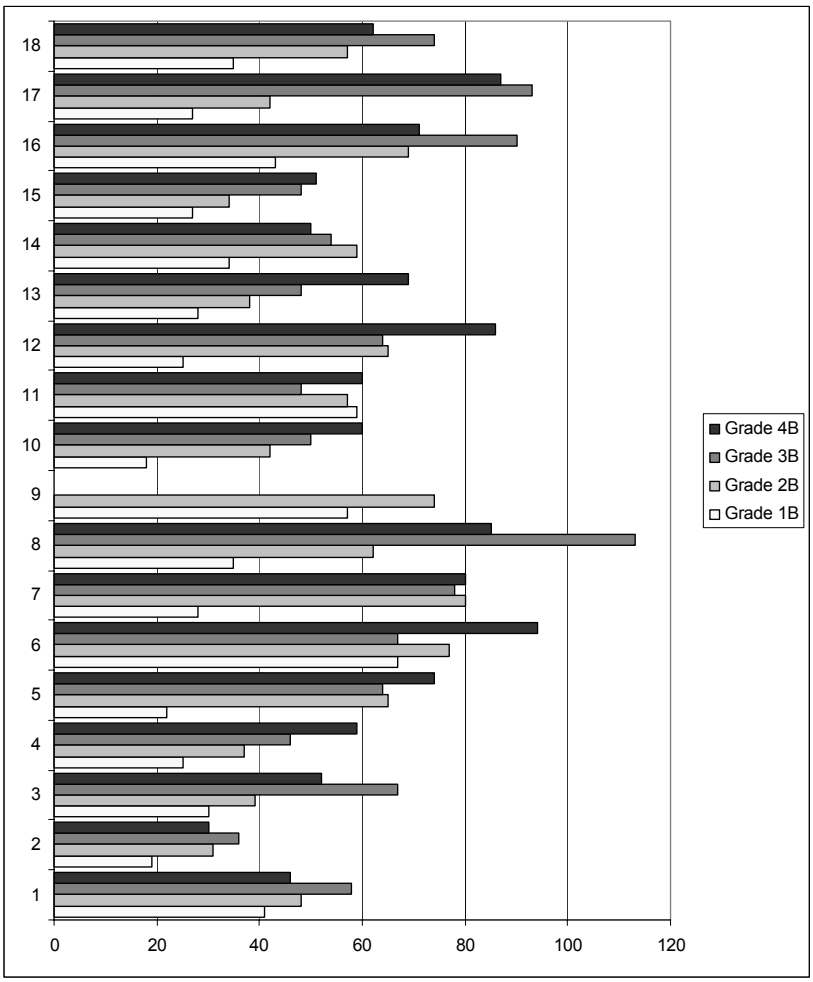

Figure 4.2: Number of clauses used in the transcripts (interview B) by subject

There is also a strong variation in length in the narratives produced by the children. They vary between 1:02 and 15:29 min.

4.5. Analysis and statistical calculations

4.5.1. Individual analysis

All clauses were coded for lexical aspect, grounding and for verbal inflections (the illustration from section 3.2 is repeated here for convenience):

Aktionsart:

STi	inchoative States
STA	States
ATi	inchoative Activities
ACT	Activities
ACC	Accomplishments
AC-i	Accomplishments without focus on inchoativity
ACH	Achievements
AH-i	Achievements without focus on inchoativity

Grounding:

FG	Foreground
BG	Background
¬FOC	sequenced clauses without Focus on main event
AMB	Ambiguous grounding

Verb Morphology:

V-ing	progressive form without / with non-target-like / with target-like auxiliary[37]
V-ø	uninflected base form
V-s	3rd person singular
V-ed	regular past
V-irreg	irregular past
perfect	present / past perfect forms
cop	copula

For a detailed description of the coding conventions used for lexical aspect and grounding and the structures which were excluded from the analysis see the discussion in chapter 3. Following Bardovi-Harlig (2000), the data of each transcript was then summarized with respect to:

1. the distribution of verbal inflections within aspectual categories
2. the distribution of verbal inflections by grounding
3. the distribution of verbal inflections and aspectual category by grounding.

These calculations are provided for both verb types and tokens. The representation is loosely based on Bardovi-Harlig's (2000:245, 296) study (her chapters 4 and 5). Table 4.5 to Table 4.10 exemplify this with the analysis of Child 01, grade 4.[38]

37 As it does not make grammatical predictions, it is irrelevant for the AH whether the -ing inflection is attached to a target-like or non-target-like verb complex.

38 The individual analyses subdivide V-ing into bare progressive inflection (ø+ing) and the use with the (target-like or *non-target-like) auxiliary ((*)aux+ing). Both categories will be merged into the single category V-ing in the group analysis (section 4.5.4).

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	0	0	0	0	0	0	**0**
V-ø	0	0	17	1	0	0	0	0	**1**
V-s	0	0	0	0	0	0	0	0	**0**
V-ed	0	0	83	5	50	2	45	9	**16**
V-irreg	33	3	0	0	50	2	55	11	**16**
perfect	0	0	0	0	0	0	0	0	**0**
cop	56	5	0	0	0	0	0	0	**5**
other	11	1	0	0	0	0	0	0	**1**
Total	**100**	**9**	**100**	**6**	**100**	**4**	**100**	**20**	**39**

Table 4.5: Tokens Child 01.4 – Distribution of verb morphology within aspectual categories

Form	FG %	(n)	BG %	(n)	¬FOC %	(n)	AMB %	(n)	Verbs (n)
V-ing	0	0	0	0	0	0	0	0	**0**
V-ø	3	1	0	0	0	0	0	0	**1**
V-s	0	0	0	0	0	0	0	0	**0**
V-ed	45	14	0	0	100	2	0	0	**16**
V-irreg	48	15	20	1	0	0	0	0	**16**
perfect	0	0	0	0	0	0	0	0	**0**
cop	3	1	60	3	0	0	100	1	**5**
other	0	0	20	1	0	0	0	0	**1**
Total	**100**	**31**	**100**	**5**	**100**	**2**	**100**	**1**	**39**

Table 4.6: Tokens Child 01.4 – Distribution of verb morphology by grounding

Form	STAi %	(n)	ACTi %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	0	0	0	0	0	0	**0**
V-ø	0	0	20	1	0	0	0	0	**1**
V-s	0	0	0	0	0	0	0	0	**0**
V-ed	0	0	80	4	50	2	44	8	**14**
V-irreg	75	3	0	0	50	2	56	10	**15**
perfect	0	0	0	0	0	0	0	0	**0**
cop	25	1	0	0	0	0	0	0	**1**
other	0	0	0	0	0	0	0	0	**0**
Total	**100**	**4**	**100**	**5**	**100**	**4**	**100**	**18**	**31**

Table 4.7: Tokens Child 01.4 – Distribution of verb morphology and aspectual category by FG

Form	STA %	(n)	ACT %	(n)	ACC-i %	(n)	ACH-i %	(n)	Verbs (n)
V-ing	0	0		0		0	0	0	**0**
V-ø	0	0		0		0	0	0	**0**
V-s	0	0		0		0	0	0	**0**
V-ed	0	0		0		0	0	0	**0**
V-irreg	0	0		0		0	100	1	**1**
perfect	0	0		0		0	0	0	**0**
cop	75	3		0		0	0	0	**3**
other	25	1		0		0	0	0	**1**
Total	**100**	**4**		**0**		**0**	**100**	**1**	**5**

Table 4.8: Tokens Child 01.4 – Distribution of verb morphology and aspectual category by BG

Form	STAi %	(n)	ACTi %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing		0	0	0		0	0	0	**0**
V-ø		0	0	0		0	0	0	**0**
V-s		0	0	0		0	0	0	**0**
V-ed		0	100	1		0	100	1	**2**
V-irreg		0	0	0		0	0	0	**0**
perfect		0	0	0		0	0	0	**0**
cop		0	0	0		0	0	0	**0**
other		0	0	0		0	0	0	**0**
Total	**0**	**0**	**100**	**1**	**0**	**0**	**100**	**1**	**2**

Table 4.9: Tokens Child 01.4 – Distribution of verb morphology and aspectual category by ¬FOC

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0		0		0		0	**0**
V-ø	0	0		0		0		0	**0**
V-s	0	0		0		0		0	**0**
V-ed	0	0		0		0		0	**0**
V-irreg	0	0		0		0		0	**0**
perfect	0	0		0		0		0	**0**
cop	100	1		0		0		0	**1**
other	0	0		0		0		0	**0**
Total	**100**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**

Table 4.10: Tokens Child 01.4 – Distribution of verb morphology and aspectual category by AMB

The aspectual categories in the four grounding contexts are termed according to their inchoativity status (cf. section 3.2.4). The type analysis was carried out along the same guidelines with the only difference that it was counted by hand.

4.5.2. Cluster analysis

The results of the transcripts of each subject reveal the individual development over a period of four years. To answer the general question about the distribution of verbal inflections in learner language over time it is important, however, to go beyond the individual level of development to the statistically relevant group level. Ideally, these groups should reflect the developmental stages in the child narratives with respect to lexical aspect and grounding. At this point of the analysis it had to be decided which cluster of transcripts should be considered a "group" in the sense of a developmental stage reached by the children at a specific point in time. A group should be sufficiently similar in a certain amount of variables, and it should be clearly located chronologically in the development from grade 1 to grade 4.

Intuitively, the most natural groups are represented by the transcripts in each of the four grades. Indeed, a pilot study to this analysis on the verb tokens revealed a progress over the four grades in all categories. However, in this pilot study some of the predicted effects were only observable in the subgroup of inexperienced subjects who had not attended the bilingual preschool (Kersten & Rohde 2007). The more experienced subjects did not show certain effects. As has been pointed out above, there are tremendous differences in quantitative and qualitative variables such as amount and intensity of L2 input, duration of contact to the L2, age of first exposure of each child, as well as in personality variables such as language aptitude, cognitive development, interest and the willingness to use the L2.[39] For this reason it is questionable whether the variable of the grade level would yield groups which are homogenous enough to reveal the patterns to be identified in this analysis. As a matter of fact, any other variable among the list above would induce the same problem, since none of these variables would be constant within the groups identified by them.

To avoid this problem, this analysis does not use an external variable to determine the groups. Rather, it makes use of the structure of the transcripts themselves as indicators of homogeneity. For this purpose, a cluster analysis was carried out with all the results of each transcript on all variables, i.e. with the percentage of inflections used by each child with aspectual categories and grounding. The cluster analysis was carried out with the token analysis and the type analysis of each individual transcript. The most homogenous classification of clusters was then used for the final analysis.

A cluster analysis *(Ward's method)* yields "clusters of children who have become grouped together by the way in which they have responded to the stimuli" (Woods et al. 1993:259). As Baker & Derwing (1982) point out, in this way, the groups are derived

39 The personality variables have not been operationalized nor would this be feasible within the scope of this analysis, but they proved to be striking factors revealed during participant observation in the class and commented on repeatedly by the class teacher. In my opinion, the huge inter-individual differences within children with the same amount of L2 exposure cannot be explained otherwise. For this reason I found it important to include them in the list above. It would be desirable for future studies to operationalize these and other possibly influential personality variables.

from the data and not from pre-established categories formed by the researcher.[40] Still, it is the researcher's choice which variables to select for clustering, and which level within the hierarchy of cluster to use for the groups. Woods et al. comment on this choice as follows:

> There are two ways of viewing the high degree of arbitrariness in the cluster analysis technique induced by leaving the investigator the choice of dissimilarity measure, clustering algorithm and cut-off dissimilarity value. It could be considered that this is a fatal defect of the procedure, in that too many subjective decisions have to be made; alternatively, it might be felt that the wide variety of possible choices is a positive benefit, allowing the technique to have a useful flexibility. Marriot (1974: 58) ... says 'The experimenter must choose that which seems to him best for his problem ... It is precisely this subjective element that gives distance-based methods their particular value.' This viewpoint is justified provided that cluster analysis is used primarily as an **exploratory technique to look for plausible structure defined *by the data alone* without the addition of *a priori* assumptions by the investigator**. (1993: 260f, bold print KK)

This is precisely the aim of the cluster analysis in this study. As in Baker & Derwing's study, the basic assumption in this study is that the groups of transcripts identified in the hierarchical cluster analysis can be located at different stages of development in the acquisition of verbal morphology.

A cluster analysis yields homogeneous groups of objects with regard to the indicated variable/s (Backhaus et al. 1996). Ward's (1963) approach to hierarchical clustering has two advantages over other cluster analyses: firstly, it produces groups with an approximately similar number of objects, and secondly these objects are most homogeneously distributed. This means that the objects within the groups are most similar to each other, and they are most different (heterogeneous), with respect to the variables, to objects within the other groups (Bacher 1996). It has to be made clear that such a procedure does not produce "correct" or "incorrect" results; rather, the results have to be interpreted as *useful* or *not useful* for a specific purpose of analysis.

Cluster analyses are visually represented in the form of dendrograms. These dendrograms provide groups with different levels of homogeneity. As pointed out above, the clusters which represent the most homogenous groups were selected for analysis. In the case of this data set, this was found in the level of four clusters of the token analysis (%) of each of the transcripts.

Figure **4.3** presents the dendrogram of this analysis with an indication of the four final groups used for the subsequent analysis.

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40 "An analysis is required such that stages, or developmental patterns, emerge from the data. The stages of development ought to be identified as a consequence of the analysis. However, the analytical methods adopted with data of this kind have tended to obscure subject-determined patterns of response by using percentage correct scores ... and then age-blocking the data to try to discern developmental trends. This has the effect of tying the children's performance to adult norms, and of equating 'stage' with 'age'. As Derwing & Baker [Baker & Derwing 1982] suggest, it may be that a given data set ought to be arranged by age groups, **but this is something that should emerge from the data rather than be imposed on it in advance**. ... Baker & Derwing utilise hierarchical clustering to overcome the problems of age-blocking and percentage correct as a measure, and to search out, in the data, groups of children who are treating similar subsets of stem-final segments as classes." (Woods et al. 1993:255f, bold print KK)

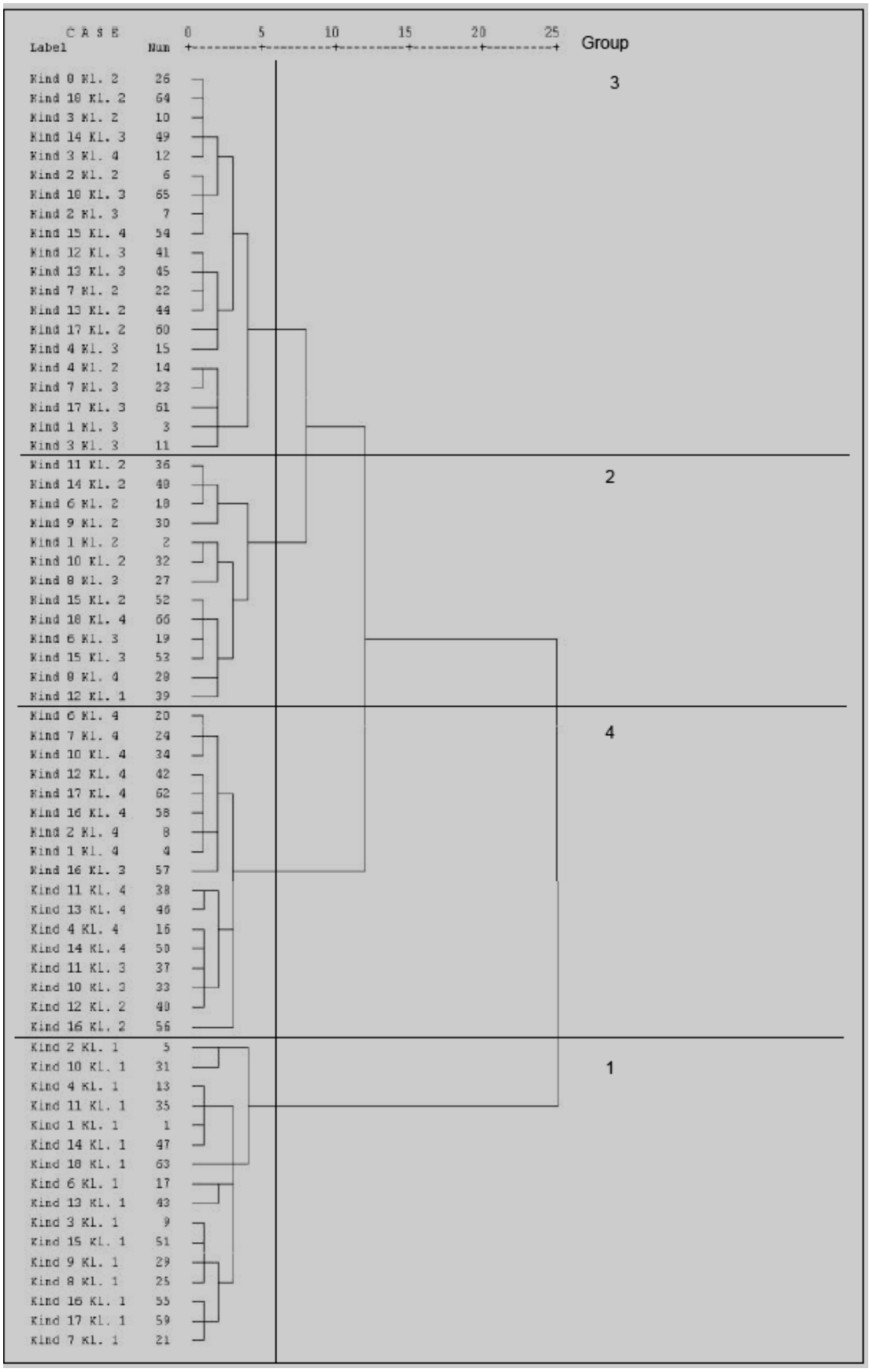


Figure 4.3: Dendrogram Token Analysis % (lines are added to indicate the clusters selected)

4.5.3. Developmental groups

Four groups of transcripts were thus identified from the hierarchical clusters yielded by the cluster analysis on the token (%) variables. These groups were then ordered Groups 1-4 according to the average time of contact to the L2. Children in Group 1 have the smallest and in Group 4 the highest amount of contact time. It was ensured that all transcripts of the individual subjects remained in the order of development by grades. This means that i.e. a grade 3 transcript had to belong to a group at the same or at a higher level than the grade 2 transcript from the same subject. The few outlier transcripts which violate this pattern (Child 08 grade 2, Child 12 grade 2, Child 18 grade 4) were excluded from the analysis. Furthermore, Child 05, the girl who had been exposed to English from her birth by her African father, was excluded because her contact time exceeded the time of the other children by up to six years. Table 4.11 shows the distribution of transcripts according to the four groups.

The advantage of these clusters is that the number of transcripts is distributed over the four groups rather evenly. The gray shadings indicating the grade levels illustrate two aspects: Firstly, they show that the groups, which are ordered according to L2 contact (in months), increase gradually in grade levels. Groups 1 and 4 are exclusively or mainly made up of grade 1 and grade 4 transcripts. This means that the clusters represent a natural development over time, as could have been expected. Secondly, however, the variation of grade levels especially in Groups 2 and 3 seems to highlight the children's individual speed of learning in that some children proceed faster than others over the period of four years. Some of the exceptional distributions, e.g. the two grade 4 transcripts in Group 3 (Children 03 and 15) and the grade 2 transcript in Group 4 (Child 16) reflect the general observations made during participant observation in class that Children 03 and 15 belong among the slowest learners who used the language with less self-confidence and enthusiasm than the others, whereas the language use of Child 16 was exceptionally good already in preschool and remained so during the whole elementary school period. She received extensive home training through her mother from preschool onwards and thus supposedly had the highest amount of L2 input of all children. She was also among the few children (together with Child 01 and Child 17) who arrived at a consistent use of past tense in their narratives in grade 4, whereas the stories of the other children still contained some degree of tense switching. To illustrate this, Table 4.12 and Table 4.13 show the stories of two children with preschool exposure to English.

Group 1	Group 2	Group 3	Group 4
Child 01 Grade 1	Child 01 Grade 2	Child 01 Grade 3	Child 01 Grade 4
Child 02 Grade 1	Child 06 Grade 2	Child 02 Grade 2	Child 02 Grade 4
Child 03 Grade 1	Child 06 Grade 3	Child 02 Grade 3	Child 04 Grade 4
Child 04 Grade 1	Child 08 Grade 3	Child 03 Grade 2	Child 06 Grade 4
Child 06 Grade 1	Child 08 Grade 4	Child 03 Grade 3	Child 07 Grade 4
Child 07 Grade 1	Child 09 Grade 2	Child 03 Grade 4	Child 10 Grade 3
Child 08 Grade 1	Child 10 Grade 2	Child 04 Grade 2	Child 10 Grade 4
Child 09 Grade 1	Child 11 Grade 2	Child 04 Grade 3	Child 11 Grade 3
Child 10 Grade 1	Child 12 Grade 1	Child 07 Grade 2	Child 11 Grade 4
Child 11 Grade 1	Child 14 Grade 2	Child 07 Grade 3	Child 12 Grade 4
Child 13 Grade 1	Child 15 Grade 2	Child 12 Grade 3	Child 13 Grade 4
Child 14 Grade 1	Child 15 Grade 3	Child 13 Grade 2	Child 14 Grade 4
Child 15 Grade 1		Child 13 Grade 3	Child 16 Grade 2
Child 16 Grade 1		Child 14 Grade 3	Child 16 Grade 3
Child 17 Grade 1		Child 15 Grade 4	Child 16 Grade 4
Child 18 Grade 1		Child 17 Grade 2	Child 17 Grade 4
		Child 17 Grade 3	
		Child 18 Grade 2	
		Child 18 Grade 3	
Ø Grade: 1	**Ø Grade: 2,33**	**Ø Grade: 2,74**	**Ø Grade: 3,69**
Ø L2 mon: 20,38	**Ø L2 mon: 36,00**	**Ø L2 mon: 40,84**	**Ø L2 mon: 57,13**

Table 4.11: Groups according to cluster analysis (ordered by group average lengths of L2 contact time in months). Child 05 grades 1-4, Child 08 grade 2, Child 12 grade 2, Child 18 grade 4 were excluded.

Child 14 (Experienced) Grade 4, Interview B	
14	One day in the evening a frog had found/ a/ a boy found a frog and he set him in a glass and the dog of the boy looked/ they both looked at the frog. Then they go to bed the fr/ and the frog jumped out of the glass and hopped/ and/ and hopped away. In the morning the bo/ boy looked in the glass and the frog was away. He looked into his boots and the f/ dog put his head in a glass. Then the boy opened one win/ opened a window and shouted: "Frog, frog, where are you?" The dog sat on the windowsillt and falled/ fall down. The glass was broken. Then the boy climbed out of the window and he take the dog in his arms. Then they go near the wood to see if the frog is there. The boy shouted: "Frog, frog, where are you?" The frog looked into a hole of a mole, but there i/ was no frog and out comes a mole. The b/ the dog shakes/ shakes a(the?) tree and the beenest falls down. Then th/ th/ the boy climbed on a tree and looked into a hole. Out of this hole comes a owl and the boy falls down. Aft/ the/ the f/ beens flies/ fl/ flies a/ after the dog and the dog runs away. Then the/ then the boy climbs on a s/ large stone and he doesn't know that the stone was/ he stands on a deer/ r/ reindeer head. The deer stuck out his head and the boy was on the head of the deer and then the deer runs to a/ to a moun/ to the end of a mountain and he f/ the dog and the boy fall/ and h/ he/ and the boy and the dog falls in a small pond. Then they sat in a pond and hea/ heard a quaking noise. The boy said: "Quiet, dog" and they looked over a trunk. There they found two fro/ two big frogs with lit/ with many little small frogs. Then the s/ boy get a small frog and the fr/ then/ and the boy and the eh frogs were happy.

Table 4.12: Excerpt of Transcript Child 14.4B; # pause; / hesitation, self-correction; ( ) comment; XXX incomprehensible; *italics* L1 utterance

Child 16 (Experienced) Grade 4, Interview B	
16	Ehm a boy named Bill and his dog Barcardi ehm looked at the glass jar ehm within a frog.
IE	Mhm.
16	Ehm because it was evening they s/ slept in their bed. Then suddenly the frog jumped out of his glass jar and suddenly disappeared. Ehm at morning when the sun shine(d?) out through the window the dog and the boy named Bill looked at the glass jar, and there was no frog in there. Eh the boy jumped up and put on his clothes, boots and everything he had. The dog eh put his muzzle in the glass jar and wanted to look if there was any frog in here/ in there. Then the boy opened(?) the window and shouted out: "Frog, where are you? Frog, come back!" And the dog wanted to look out the window, too, but then fell down into the grass. The boy looked(?) down and ran out of the house to come to the dog. He was a little bit angry. But the dog gave him a little kiss. Ehm but the/ ehm the glass jar ha/ was broken. So the dog was free. Then they wanted to go into the wood and the boy shouted out: "Frog, where are you? Frog, come back!" Then the dog looked up to the bees and ran to the beehive. The boy looked(?) down and shouted in a little hole in the grass: "Come out frog! Are you in there?" But suddenly a mole come(?) out and stuck his nose out. Then the dog ehm climb/ wanted to climb up the tree. And suddenly the beehive fell down. The bees were very angry and they want/ and they wanted to sting the dog. In this time the boy, Bill, ran up/ climbed up the big tree and mh shouted in a hole/ hole ehm "Frog, come out! Are you in there?" But suddenly an owl rushed out of this hole and the boy fell down on the ground. Ehm the dog ran into th/ eh ehm ran/ ran into the wood ehm be/ because the bees wantes (mispronounces) to sting him in his skin. Ehm the boy was a little afraid of the owl that came out of the hole and then he climbed up a big rock. Then he put his hands on the antlers and shouted: "Oh come out! Frog, are you there?" But suddenly ehm a deer came out of there and carried the dog/ the/ the/ Bill/ carried Bill on his head and they fell down a cliff, the dog and Bill. They fell into a pond. Ehm but then, suddenly, as mh as they stuck out their head of the water they heard a little noise. Then the boy/ Bill said: "Pssht" because the dog was s/ so loud in the water. Then they climbed o/ over the trunk and saw the/ hi/ their frog and/ mh and another frog with their frog babies. The/ Bill took one of the f/ frog babies and went home. And so everybody has his family.

Table 4.13: Excerpt of Transcript Child 16.4B; # pause; / hesitation, self-correction; ( ) comment; XXX incomprehensible; *italics* L1 utterance

4.5.4. Group analysis

After establishing the four groups, the aim of the next analytical step was to create a graphic representation of the developmental effects predicted by the AH and the DH. For this reason, the data of the transcripts identified for each group were summarized in tables according to their distribution of lexical aspect, grounding, and lexical aspect in each grounding category. The group analysis follows the same pattern as the individual analysis (cf. section 4.5.1), but in addition to the raw amounts the group analysis also includes percentages. This section will first explain the different analytical steps for token and type analysis. Subsequently, the results of the token and the type analysis (raw numbers and percentages) for the four groups are presented. The results of lexical aspect are presented in section 4.5.4.4, those of discourse grounding in sec-

tions, 4.5.4.5, and those which show lexical aspect in the context of the different grounding categories in sections 4.5.4.6. These tables represent the basis for the graphic illustration of the data in section 5. As the effects become visible at one glance in the graphs, the results will be discussed in that section by means of the illustrations rather than on the basis of the scores in the tables following below.

4.5.4.1. Within-category analysis and across-category analysis

Before the tables are presented in the sections below, one remark is in order about establishing the reference point for the percentages which are calculated for the group analysis. Theoretically, two calculations are possible with the same data. As Bardovi-Harlig (2000) explains, it is a question of the methodological approach whether the percentages are calculated by lexical categories or by verbal inflections. She calls the first approach the *within-category analysis*, and the second one the *across-category analysis*, focusing both times on the categories of lexical aspect (Bardovi-Harlig 2000:252ff, 2002). To illustrate the difference between both approaches, Table 4.14 and Table 4.15 show the two different percentage calculations:

Within-category analysis:

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	86	119	56	27	61	84	**230**
V-ø	35	11	10	14	35	17	20	28	**70**
V-s	48	15	1	2	0	0	6	8	**25**
V-ed	0	0	1	1	0	0	2	3	**4**
V-irreg	16	5	0	0	0	0	4	5	**10**
perfect	0	0	1	1	0	0	2	3	**4**
other	0	0	1	1	8	4	5	7	**12**
Total	**100**	**31**	**100**	**138**	**100**	**48**	**100**	**138**	**355**

Table 4.14: Tokens Group 1, grade 1 – Distribution of aspectual categories within verb morphology according to Within Category Analysis (categories = 100%)

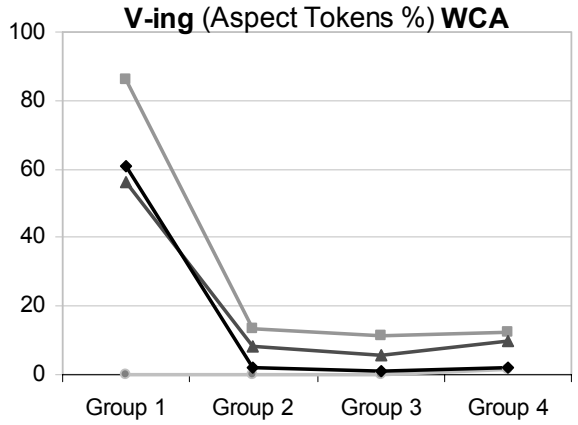
Across-category analysis:

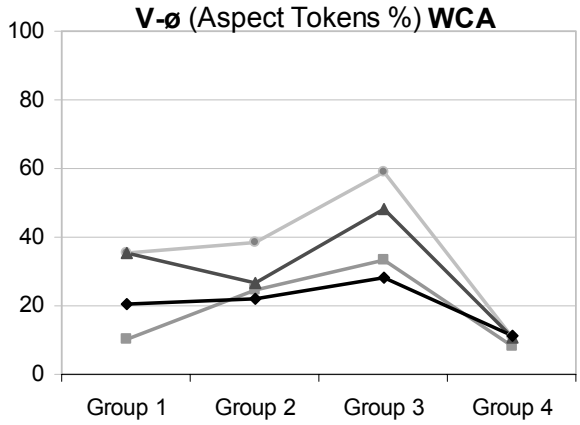
Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)	Total %
V-ing	0	0	52	119	12	27	37	84	**230**	**100**
V-ø	16	11	20	14	24	17	40	28	**70**	**100**
V-s	60	15	8	2	0	0	32	8	**25**	**100**
V-ed	0	0	25	1	0	0	75	3	**4**	**100**
V-irreg	50	5	0	0	0	0	50	5	**10**	**100**
perfect	0	0	25	1	0	0	75	3	**4**	**100**
other	0	0	8	1	33	4	58	7	**12**	**100**
Total		**31**		**138**		**48**		**138**	**355**	

Table 4.15: Tokens Group 1, grade 1 – Distribution of aspectual categories within verb morphology according to Across Category Analysis (inflections = 100%)

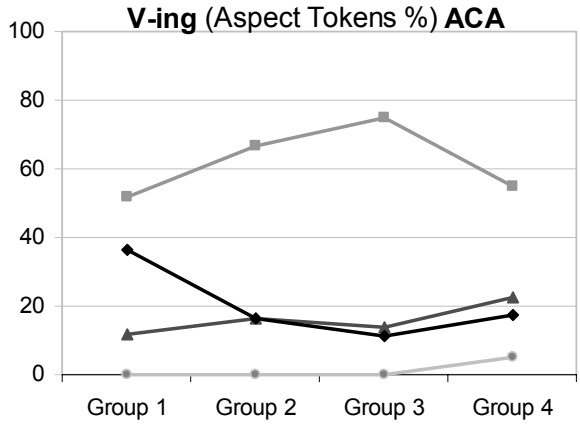
It is striking that the percentages in each column differ greatly in Table 4.14 and Table 4.15. Mathematically, this is not surprising. But what is the effect on the data analysis? In fact, both analyses give answers to different research questions. The calculation in Table 4.14 answers questions such as: *What percentage of ACT are inflected with V-ing?*, or more generally, *"How are each of the lexical aspectual classes marked by learners?"* (Bardovi-Harlig 2002:137f), whereas the one in Table 4.15 answers questions such as: *What percentage of V-ing are attached to ACT?*, or, *"Where do various morphemes occur?"* (Bardovi-Harlig 2002:134). The following figures taken from the aspectual analysis of this data corpus serve to illustrate the differences between the two analyses.

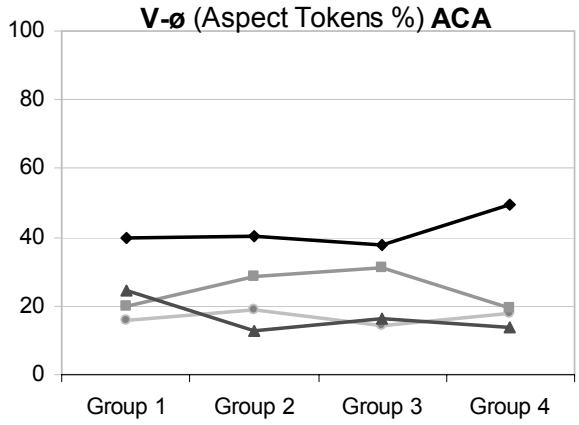
Within-category analysis (WCA)





Across-category analysis (ACA)





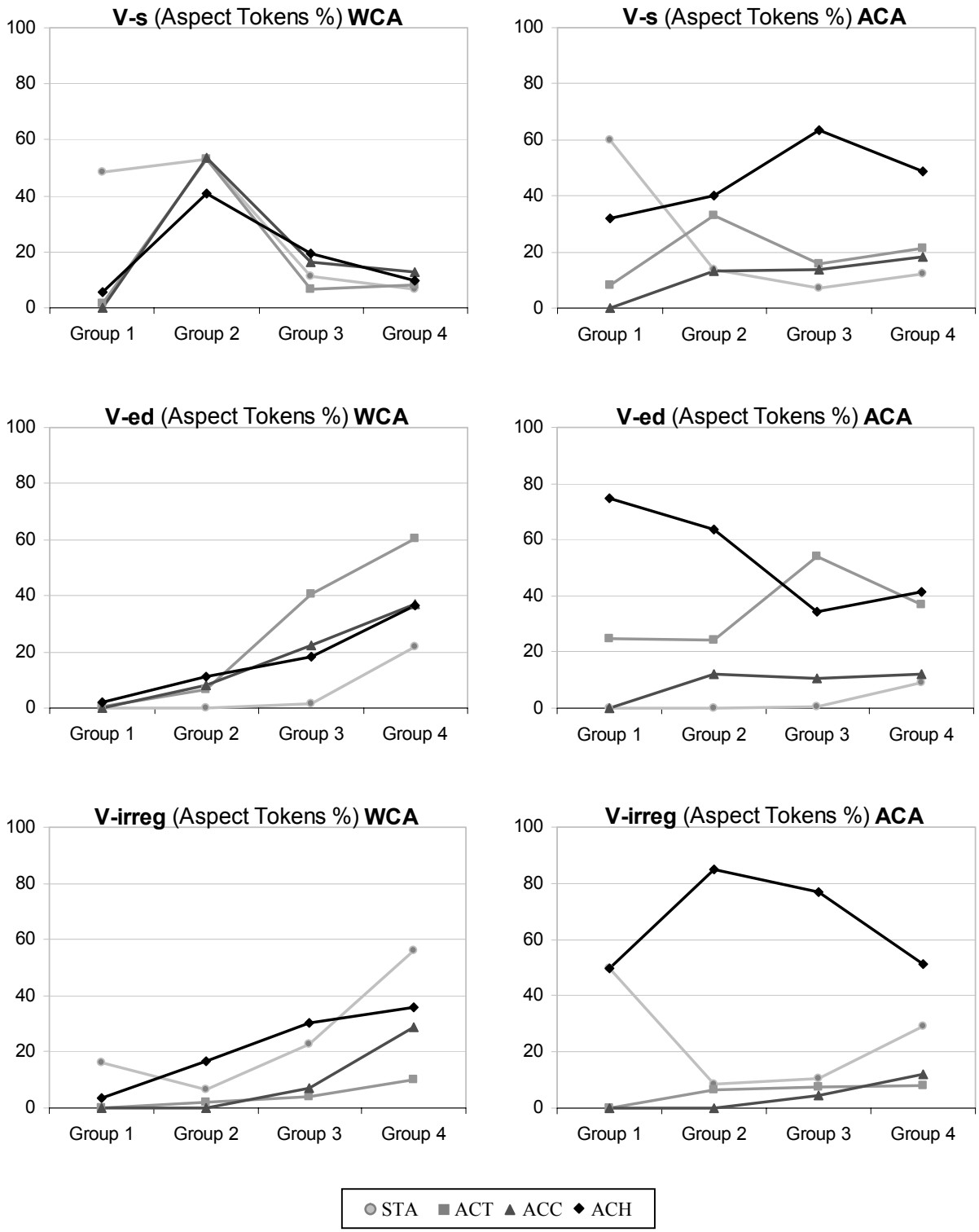


Figure 4.4: *Within-* and *across-category* token analysis of verbal inflections with lexical aspect[41]

41 The tables on which these graphs are based are presented below.

Figure 4.4 shows that, with all inflections, the results of the two approaches differ widely with respect to the development over the four groups and with respect to their relative frequency. While the general aspectual effect is at least similar with V-ing (ACT prevail over ACC and ACH in both diagrams), an almost reverse effect occurs with V-ø, V-s, and V-ed (a strong bias for ACH in all across-category diagrams). Note that the diagrams will be duplicated and discussed in section 5.

There has been some discussion as to the value of both approaches. Rohde (1996:1121) argues that the within-category approach focuses perhaps too strongly on lexical categories, and that the across-category approach "highlights the fact that a given inflection is used across semantic verb classes and is possibly not as strongly influenced by verbal aspect as is sometimes suggested." Bardovi-Harlig (2000, 2002, based on Robison 1995) on the other hand argues that the across-category approach is more sensitive to differences in the number of tokens in each category, which are leveled out in the within-category analysis. However, with respect to this difference, Robison's argumentation seems somewhat misleading. Here is the full quote:

> The percentage figures in Tables 2 and 4 represent the distribution of inflections within each aspectual or temporal category, thus, 1.6 per cent of all state tokens in Group IV (Table 2) were in progressive forms. [= within-category approach] This differs from the mode of presentation in earlier studies in which percentages are displayed for each inflection, such as the percentages of all progressive tokens that are states. [= across-category approach] **The presentation here** [= within-category approach] **permits a more accurate comparison across categories.** For example, past-marked activities outnumber past-marked durative events in Groups I and II only because activities outnumber durative events as a whole, the percentage figures rightfully indicate that past-marking is skewed in favor of durative events. (Robison 1995:354f, insertions and highlights are mine)

The highlighted sentence seems to indicate that Robison discusses the advantage of his within-category approach over the across-category representation of earlier studies (where "percentages are displayed for each inflection"). The following examples and explanation, however, do not refer to the different percentages in an across-category analysis, although the syntactic connection seems to indicate this; instead, it is based on the *raw scores* he presented earlier in his Table 1: past-marked activities (Gr. 2, n=13) vs. past-marked durative events (Gr. 2, n=12) in the raw scores (his Table 1, p. 354) are opposed to past-marked activities (Gr. 2, %=4.3) vs. past-marked durative events (Gr. 2, %=10.9) in the percentage distribution (his Table 2, p. 355). Thus, this example illustrates why it is necessary to operate with *relative amounts* (percentages) instead of raw scores.

But the argumentation, although unclear in the quotation above, also applies to the difference between within- and across-category analysis. Imagine the following example: all STA in a group are inflected with -s, but there are only 10 STA tokens on the whole; and on the other hand, only 20 out of 200 ACH in the group are inflected with -s: the across-category analysis would still yield a higher percentage of ACH for V-s than for STA, as 20 out of all V-s tokens are higher than 10 out of all V-s tokens.

Thus, as Bardovi-Harlig argues, the across-category analysis is indeed sensitive to the number of tokens produced in each category.

However, so far it has been neglected in the literature that the same argument holds for the within-category analysis in reverse. Table 4.14 shows that 61% (n= 84) of all ACH are inflected with V-ing and only 4% (n=5) with V-irreg. However, 84 tokens represent only 37% out of 230 occurrences of V-ing, but 5 tokens are 50% out of 10 occurrences of V-irreg (Table 4.15). This shows that, while the across-category analysis is sensitive to the number of tokens produced in each category, the within-category analysis is sensitive to the number of tokens produced with each inflection. The development measured by the within-category analysis thus always also reflects a decreased or increased use of certain inflections. Figure 4.5 shows that both verbal inflections and lexical categories are distributed unevenly over the transcripts:

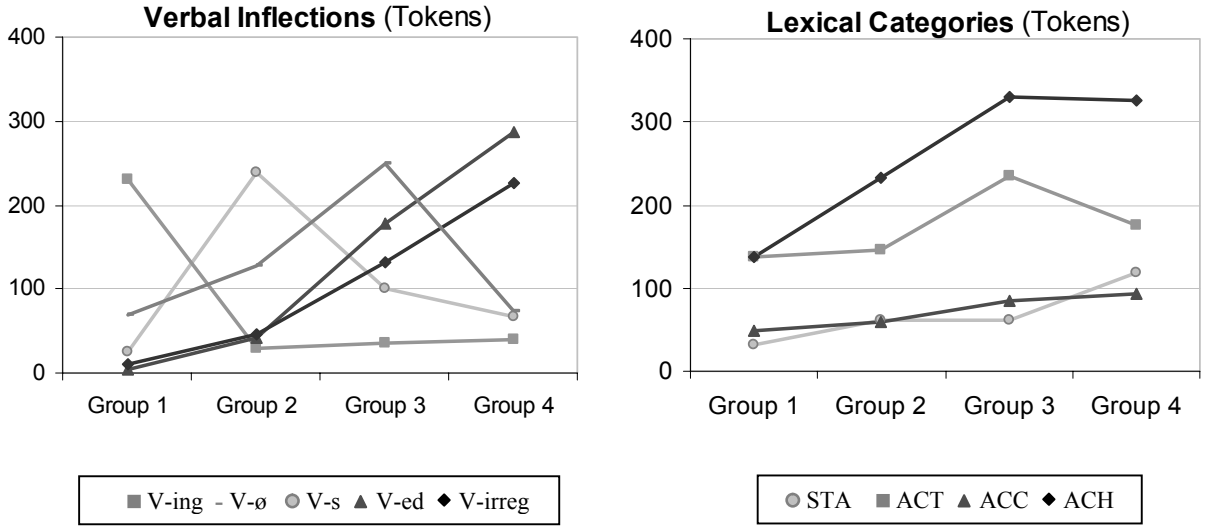


Figure 4.5: Raw numbers of tokens produced in lexical categories and with verbal inflections

As becomes obvious in Figure 4.5 (lexical categories), ACH and ACT are most frequently produced in the data. As argued above, this strong bias becomes clearly visible in the across-category diagrams in Figure 4.4 above, where ACH prevail in all cases except for V-ing. The distribution of verbal inflections is more skewed. V-ing are used with highest frequency by Group 1, V-s by Group 2, V-ø by Group 3, and V-ed and V-irreg finally by Group 4. And as predicted, these peak values are also found in the graphic representation of the within-category analysis: V-ing has its peak in Group 1 and decreases afterwards, V-s in Group 2, V-ø in Group 3, and finally V-ed and V-irreg prevail in Group 4.

Bardovi-Harlig argues that within-category analyses are much better suited to detect an acquisitional development. In reanalyzing two studies (Bardovi-Harlig 1998, Salaberry 1999) with both approaches, she demonstrates that developmental effects are clearly visible in the within-category analysis but do not occur in the across-category

comparison (her graphs in Bardovi-Harlig 2000:259, 264, 2002). In her two comparative studies, Bardovi-Harlig refers to a selected range of morphemes only, i.e. to past morphology in L2 English (Bardovi-Harlig 1998), and to imperfective marking in L2 Spanish (Salaberry 1999). Yet, Figure 4.4 corroborates these findings with data from our corpus for all verbal inflections. It has become clear, however, that this developmental effect does not rely exclusively on interlanguage hypotheses about the *aktionsarten*, as was supposed before. In fact, the within-category analysis of lexical aspect represents, already in itself, an *interaction of two different factors*, i.e. the *frequency of specific verbal inflections* in the data and the *prototypical inflecting of lexical categories*. (And the same is true, in reverse, for the across-category analysis).

Following this line of reasoning, the developmental effects observed in the within-category analysis result from the fact that the inflectional categories are only in the process of being acquired at the time of investigation, and that during this process they are unevenly distributed in the learner language. Equivalently, the across-category analysis does not show a strong developmental effect because predicates containing the different *aktionsarten* are already part of the learners' interlanguage system at the time of first acquisition and do not increase or decrease with time. In addition, they strongly depend on the stimulus, i.e. the picture story. This was held constant over the four elicitation times (the same is necessarily true for cross-sectional studies in which all developmental groups are tested with the same elicitation method), so it is not surprising that the distribution of categories remains more constant throughout the study than the use of verbal inflections.

It is thus very important to keep in mind that the development in both approaches strongly depends on the numbers of tokens. The question of how to eliminate this interdependence is, unfortunately, out of the scope of this study. Further methodological discussions of this issue are desirable in the future. For the purpose of the present study I find it justifiable to use a within-category approach for data analysis for two reasons. First, the numbers of inflections indicate an interesting aspect of the learning process, and second, this approach renders results comparable to previous studies, especially the one of Bardovi-Harlig (1998, 2000).

4.5.4.2. Scaling the type count: Fractions

While the previous section presented data from the token count, the type analysis merits a few additional comments. The type tables are based on the same schema as the token tables. However, the mathematical calculation in the *"percentage"* columns of the type analysis needs some further explanation.

Unlike the token analysis, the types needed to be counted by hand since it was impossible to program the system in such a manner that it differentiates between different verb types in a lexical category with a specific inflection. As a characteristic of the type count, the total within each lexical category does not correspond to the sum of the numbers above (e.g. Table 4.21, (n) in columns STA / ACT / ACC / ACH). This

arises from the fact that the same lexeme in a category may be used with different inflections: if the ACT *go* occurs with V-ing (n=2), V-s (n=3), and V-ed (n=4) in the group data, it is counted 2, 3, or 4 times, respectively, in each row, but it is only counted once in the total. The total thus indicates the lexical variability within one aspectual category, e.g. how many different types of STA are used by the respective group transcripts, notwithstanding that the same lexeme may occur several times in the different rows. While the token total is the sum of all occurrences of inflections within an *aktionsart*, the type total is generally lower than the sum. An exception to this rule is the (rather rare) case that all types within a category only occur with a single inflection. This usually only happens if a column holds only one inflection (e.g. Table 4.53) or if the number of inflections is generally very low. Sections 4.5.4.4, 4.5.4.5, and 4.5.4.6 show the results of the type analysis for lexical aspect, grounding, and the combined contexts.

Since the type total of each category does not equal the sum of the column above, the formula for regular percentages cannot, in fact, be applied to the type analysis. However, to be able to relate each lexical category to the other categories, and to compare the type analysis to the token analysis, it is indispensable to use some means of mathematical operation which permits a relation or comparison between the different categories. To give an example: 3 types of STA (with V-s) out of 10 different STA verbs represent a very different fraction than 3 types (with perfect) out of 51 different ACH verbs (Table 4.24). This relation has to be accounted for mathematically, otherwise the graphic representation of the results (section 5) does not indicate a valid relation between the graphs of the categories, and, what is more, it cannot be compared to the token analysis.

One suggestion which came up in the discussion of how to solve this problem was to use simple fractions (e.g. 2/10, 8/22, 3/13, 4/51 in V-ing, Table 4.24) and multiply them with 100 for comparability. This would in fact express a relation within each category (i.e. column), but it would still not yield comparability between the categories. The reason for this lies in the lexical variability within each category: if the type total of a column equals the sum of the amounts above (i.e. the "rare cases" with high lexical variability, see above), the fractions would add up to 100, and each single fraction would be smaller than 100. If however the type total is smaller than the total sum of the amounts above, each single fraction of the type total would, in effect, be higher compared to the same fraction of the sum total. Table 4.16 illustrates this effect:

Form	1. Type Total = Sum Total		2. Type Total ≠ Sum Total		3. Type Total ≠ Sum Total	
	/	(n)	/ of Type Total	(n)	/ of Sum Total	(n)
V-ing	20	2	40	20	20	20
V-ø	40	4	60	30	30	30
V-s						
V-ed	40	4	100	50	50	50
V-irreg						
perfect						
other						
Total	**100**	**10**	**200**	**50**	**100**	**100**

Table 4.16: Categorical relation based on fractions (x 100) of type total (usually smaller than the total of the sum of the amounts above, column 2) and of sum total (usually higher than the total of verb types, column 3). The fractional values (/) are lower in columns with low lexical variability (1) than in columns with high lexical variability (2). Column 3 repeats the values (n) of column 2 but gives the percentage of the sum instead of the type total. These values are significantly lower than those of the type total (2). (The numbers in the table are hypothetical.)

This hypothetical comparison shows that a column with maximum lexical variability (column 1), in which the types vary with each inflection so that the sum of all types equals the sum of the column, shows significantly lower values of relational fractions (/) than a column with low lexical variability (column 2). As a comparison, the fractional values of the total sum instead of the type total is indicated in column 3. (This calculation equals percentages, which also means max. lexical variability of types.) These fractional values are much lower than those in column 2.

A graphic representation of columns 1 and 2, i.e. of fractions based on the type total, would yield much "higher" graphs for column 2 than for column 1. But this does not reflect an accurate relationship between the two categories in 1 and 2. In effect, their relationship based on fractions is critically dependent on the amount of lexical variability within the column: the lower the lexical variability, the higher the values of the fractions (2), and the higher the variability, the lower the values of the fractions (1). For this reason, fractions cannot be used as a valid means to indicate relationships between the categories.

4.5.4.3. Scaling the type count: A formula

To remedy this problem, the following formula was created by a statistician,[42] which takes into account a scaling of type total and sum total of each column:

42 I am very grateful to S. Derheim (personal communication) for suggesting this mathematical operation.

Type Scaling Formula:

$$y_i = \left(x_i / \sum_{i=1}^{n} x_i \right) \cdot 100$$

with y_i: relational value in column "%"; $x_i = v_i / t$; v_i: value of inflection; t: type total

To illustrate this formula with an example, take the values of V-ing with STA in Table 4.24:

V-ing = 2
type total = 10
sum total (2+5+3+2+6+2) = 20
relational value = 10

$$y_{ing} = \frac{2}{10} / \frac{2+5+3+2+6+2}{10} \times 100 = \frac{2}{10} \times \frac{10}{20} \times 100 = 10$$

The formula thus takes the relation of the inflectional value to the type total (2/10) and the relation of the sum total to the type total ($\sum_{i=1}^{n} v_i$ /10) into account. In this way, the type total and the sum total are scaled against each other. This allows a comparison across categories.

As a consequence of this operation, the type total is cancelled out in the equation. The remaining operation is, in effect, the same operation used to calculate percentages, as the sum total is the only remaining reference value in the operation ($y_i = v_i / \sum_{i=1}^{n} v_i \times 100$). Thus, this scaling allows a comparison with the token analysis. This is indispensable to answer the research questions with respect to this data set.

Finally, it can be argued that percentages reveal the most important information for the study. A percentage relation answers the question:

In category *c*, how many types *out of all differently inflected types* carry the inflection *i*?

as opposed to:

… how many types out of all different types?

That is to say, it is equally valid, or arguably even more valid, to say:

a) Out of 20 differently inflected STA-types, 10 types are inflected with V-ed,

than:

b) Out of 10 different STA-types, 10 types are inflected with V-ed.

Of course, this difference in relation poses a problem for data coding. Which version is more valid to express the categorical relations in the data with respect to our hypotheses, a) or b)? Pondering this difference, I finally came up with one argument in favor of a). Here is what I suggest to solve this problem: For testing the hypotheses,the lexical variability expressed in the single value is actually the most important factor: for instance, it is most important for the predictions that 10 different types are used with

V-ed and only 2 different types are used with V-ing in STA, *no matter if there are 10 or 20 STA-types used on the whole in the category.*

In other words: When narrating a story, the child has to decide in each clause: "Which inflection do I use with this type of verb?" But if s/he makes different decisions with respect to the same verb type in different clauses, these decisions should be accounted for. They should not be merged into one single category as if they were equivalent. To the child, they are not equivalent; otherwise s/he would have inflected them in the same way in both cases. Yet, if we take the type total as the only reference parameter, this is exactly what we are doing: merging differently inflected types into one parameter and thus canceling out the differences in the child's decisions. We can only account for these differences if we take, as a total, the sum of all *different decisions* the child makes with respect to a verb type. We would not be able to account for them by using the type total as the only reference parameter. Percentages, as well as the Type Scaling Formula, take the differences in the child's decisions as well as the lexical variability within each inflectional type value into account.

For these three reasons, I considered it safe to use the formula above to express type relations between the categories. I do not claim, however, that I have solved the problem irrevocably with this line of argumentation. These questions should be reconsidered in collaboration with trained mathematicians. Unfortunately, a more profound mathematical discussion is out of the scope of this study, but I see an important area of future research in the operationalization of such data counts.

4.5.4.4. Lexical Aspect

Token analysis

The following tables show the distribution of inflections according to the four *aktionsarten* in Groups 1-4. The inflectional categories ø+ing and (*)aux+ing from the individual analyses (section 4.5.1) are merged, here, into a single category V-ing (compare also footnote 22).

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	86	119	56	27	61	84	**230**
V-ø	35	11	10	14	35	17	20	28	**70**
V-s	48	15	1	2	0	0	6	8	**25**
V-ed	0	0	1	1	0	0	2	3	**4**
V-irreg	16	5	0	0	0	0	4	5	**10**
perfect	0	0	1	1	0	0	2	3	**4**
other	0	0	1	1	8	4	5	7	**12**
Total	**100**	**31**	**100**	**138**	**100**	**48**	**100**	**138**	**355**

Table 4.17: Tokens Group 1 – Distribution of verb morphology within aspectual categories

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	14	20	8	5	2	5	**30**
V-ø	39	24	24	36	27	16	22	51	**127**
V-s	53	33	53	78	53	32	41	95	**238**
V-ed	0	0	7	10	8	5	11	26	**41**
V-irreg	6	4	2	3	0	0	17	39	**46**
perfect	0	0	0	0	3	2	4	9	**11**
other	2	1	0	0	0	0	3	7	**8**
Total	**100**	**62**	**100**	**147**	**100**	**60**	**100**	**232**	**501**

Table 4.18: Tokens Group 2 – Distribution of verb morphology within aspectual categories

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	11	27	6	5	1	4	**36**
V-ø	59	36	33	78	48	41	28	94	**249**
V-s	11	7	7	16	16	14	19	64	**101**
V-ed	2	1	41	96	22	19	18	61	**177**
V-irreg	23	14	4	10	7	6	31	101	**131**
perfect	2	1	1	3	0	0	2	6	**10**
other	3	2	2	5	0	0	0	1	**8**
Total	**100**	**61**	**100**	**235**	**100**	**85**	**100**	**331**	**712**

Table 4.19: Tokens Group 3 – Distribution of verb morphology within aspectual categories

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	2	2	13	22	10	9	2	7	**40**
V-ø	11	13	8	14	11	10	11	36	**73**
V-s	7	8	8	14	13	12	10	32	**66**
V-ed	22	26	60	106	37	35	37	119	**286**
V-irreg	56	66	10	18	29	27	36	116	**227**
perfect	0	0	0	0	0	0	1	4	**4**
other	3	3	1	2	1	1	3	11	**17**
Total	**100**	**118**	**100**	**176**	**100**	**94**	**100**	**325**	**713**

Table 4.20: Tokens Group 4 – Distribution of verb morphology within aspectual categories

Type Analysis

The following tables show the type analysis of lexical aspect.

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0		60	15	44	7	48	19	**41**
V-ø	38	3	24	6	44	7	20	8	**24**
V-s	50	4	4	1	0		8	3	**8**
V-ed	0		4	1	0		5	2	**3**
V-irreg	13	1	0		0		5	2	**3**
perfect	0		4	1	0		3	1	**2**
other	0		4	1	13	2	13	5	**8**
Total	**100**	**5**	**100**	**17**	**100**	**10**	**100**	**24**	**56**

Table 4.21: Types Group 1 – Distribution of verb morphology within aspectual categories

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0		25	9	12	2	1	1	**12**
V-ø	31	4	28	10	35	6	21	15	**35**
V-s	38	5	36	13	35	6	31	22	**46**
V-ed	0		6	2	6	1	15	11	**14**
V-irreg	23	3	6	2	0		13	9	**14**
perfect	0		0		12	2	11	8	**10**
other	8	1	0		0		7	5	**6**
Total	**100**	**6**	**100**	**19**	**100**	**9**	**100**	**31**	**65**

Table 4.22: Types Group 2 – Distribution of verb morphology within aspectual categories

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0		16	10	11	2	5	4	**16**
V-ø	33	5	28	17	32	6	37	27	**55**
V-s	20	3	15	9	26	5	22	16	**33**
V-ed	7	1	23	14	16	3	16	12	**30**
V-irreg	20	3	5	3	16	3	14	10	**19**
perfect	7	1	5	3	0		4	3	**7**
other	13	2	8	5	0		1	1	**8**
Total	**100**	**6**	**100**	**34**	**100**	**10**	**100**	**34**	**84**

Table 4.23: Types Group 3 – Distribution of verb morphology within aspectual categories

Form	STA %	(n)	ACT %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	10	2	19	8	12	3	4	4	**17**
V-ø	25	5	19	8	16	4	19	18	**35**
V-s	15	3	19	8	24	6	15	14	**31**
V-ed	10	2	26	11	16	4	30	28	**45**
V-irreg	30	6	12	5	28	7	20	19	**37**
perfect	0		0		0		3	3	**3**
other	10	2	5	2	4	1	9	8	**13**
Total	**100**	**10**	**100**	**22**	**100**	**13**	**100**	**51**	**96**

Table 4.24: Types Group 4 – Distribution of verb morphology within aspectual categories

4.5.4.5. Discourse grounding

Token Analysis

The four tables in this section represent the results of the grounding analysis for the token calculation.

Form	FG %	(n)	BG %	(n)	¬FOC %	(n)	AMB %	(n)	Verbs (n)
V-ing	64	162	58	21	71	39	67	8	**230**
V-ø	21	52	17	6	18	10	17	2	**70**
V-s	6	16	17	6	5	3	0	0	**25**
V-ed	1	3	0	0	2	1	0	0	**4**
V-irreg	3	8	3	1	0	0	8	1	**10**
perfect	1	2	3	1	0	0	8	1	**4**
other	4	9	3	1	4	2	0	0	**12**
Total	**100**	**252**	**100**	**36**	**100**	**55**	**100**	**12**	**355**

Table 4.25: Tokens Group 1 – Distribution of verb morphology by grounding

Form	FG %	(n)	BG %	(n)	¬FOC %	(n)	AMB %	(n)	Verbs (n)
V-ing	2	8	19	14	5	4	33	4	**30**
V-ø	26	89	17	13	31	24	8	1	**127**
V-s	48	163	39	29	53	41	42	5	**238**
V-ed	9	31	5	4	5	4	17	2	**41**
V-irreg	12	39	4	3	5	4	0	0	**46**
perfect	0	1	13	10	0	0	0	0	**11**
other	2	6	3	2	0	0	0	0	**8**
Total	**100**	**337**	**100**	**75**	**100**	**77**	**100**	**12**	**501**

Table 4.26: Tokens Group 2 – Distribution of verb morphology by grounding

Form	FG %	(n)	BG %	(n)	¬FOC %	(n)	AMB %	(n)	Verbs (n)
V-ing	2	11	25	18	0	0	32	7	**36**
V-ø	38	206	24	17	25	20	27	6	**249**
V-s	14	77	7	5	23	18	5	1	**101**
V-ed	25	137	11	8	31	25	32	7	**177**
V-irreg	19	103	15	11	20	16	5	1	**131**
perfect	0	0	13	9	1	1	0	0	**10**
other	1	5	4	3	0	0	0	0	**8**
Total	**100**	**539**	**100**	**71**	**100**	**80**	**100**	**22**	**712**

Table 4.27: Tokens Group 3 – Distribution of verb morphology by grounding

Form	FG %	(n)	BG %	(n)	¬FOC %	(n)	AMB %	(n)	Verbs (n)
V-ing	4	22	7	6	9	7	36	5	**40**
V-ø	10	56	17	14	2	2	7	1	**73**
V-s	8	41	16	13	12	10	14	2	**66**
V-ed	42	227	11	9	61	50	0	0	**286**
V-irreg	35	185	30	25	13	11	43	6	**227**
perfect	0	0	4	3	1	1	0	0	**4**
other	1	4	15	12	1	1	0	0	**17**
Total	**100**	**535**	**100**	**82**	**100**	**82**	**100**	**14**	**713**

Table 4.28: Tokens Group 4 – Distribution of verb morphology by grounding

Type Analysis

This section shows the results of the type count for grounding.

Form	FG %	(n)	BG %	(n)	¬FOC %	(n)	AMB %	(n)	Verbs (n)
V-ing	49	37	44	7	61	20	50	4	**41**
V-ø	24	18	19	3	24	8	25	2	**24**
V-s	9	7	19	3	6	2	0	0	**8**
V-ed	4	3	0	0	3	1	0	0	**3**
V-irreg	4	3	6	1	0	0	13	1	**3**
perfect	1	1	6	1	0	0	13	1	**2**
other	8	6	6	1	6	2	0	0	**8**
Total	**100**	**50**	**100**	**12**	**100**	**25**	**100**	**5**	**56**

Table 4.29: Types Group 1 – Distribution of verb morphology by grounding

Form	FG %	(n)	BG %	(n)	¬FOC %	(n)	AMB %	(n)	Verbs (n)
V-ing	4	4	20	8	10	4	33	3	**12**
V-ø	29	30	17	7	36	14	11	1	**35**
V-s	38	40	22	9	41	16	44	4	**46**
V-ed	12	12	7	3	5	2	11	1	**14**
V-irreg	13	13	7	3	8	3	0	0	**14**
perfect	1	1	22	9	0	0	0	0	**10**
other	4	4	5	2	0	0	0	0	**6**
Total	**100**	**52**	**100**	**24**	**100**	**25**	**100**	**7**	**65**

Table 4.30: Types Group 2 – Distribution of verb morphology by grounding

Form	FG %	(n)	BG %	(n)	¬FOC %	(n)	AMB %	(n)	Verbs (n)
V-ing	6	8	21	8	0	0	40	6	**16**
V-ø	37	48	24	9	32	14	27	4	**55**
V-s	23	30	11	4	23	10	7	1	**33**
V-ed	18	23	5	2	25	11	20	3	**30**
V-irreg	12	16	18	7	18	8	7	1	**19**
perfect	0	0	16	6	2	1	0	0	**7**
other	4	5	5	2	0	0	0	0	**8**
Total	**100**	**72**	**100**	**23**	**100**	**30**	**100**	**10**	**84**

Table 4.31: Types Group 3 – Distribution of verb morphology by grounding

Form	FG %	(n)	BG %	(n)	¬FOC %	(n)	AMB %	(n)	Verbs (n)
V-ing	9	13	9	4	13	5	30	3	**17**
V-ø	20	28	20	9	5	2	10	1	**35**
V-s	15	21	15	7	21	8	20	2	**31**
V-ed	27	38	15	7	31	12	0	0	**45**
V-irreg	25	35	17	8	26	10	40	4	**37**
perfect	0	0	7	3	3	1	0	0	**3**
other	3	4	17	8	3	1	0	0	**13**
Total	**100**	**81**	**100**	**25**	**100**	**27**	**100**	**10**	**96**

Table 4.32: Types Group 4 – Distribution of verb morphology by grounding

4.5.4.6. Combined categories of lexical aspect and grounding

Token Analysis

To account for the differing predictions made by the Aspect Hypothesis and the Discourse Hypothesis, it was necessary to subdivide the linguistic context of the respective inflections further. The following tables present the categories of lexical aspect in the three relevant grounding contexts coded in this analysis, FG, BG, and ¬FOC. In this way it is possible to tease apart the overlapping predictions of both hypotheses. The context AMB was neglected in this overview since it does not give any relevant insights about lexical aspect in grounding due to its uninterpretable grounding status.

Foreground:

FG Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	88	72	58	19	60	71	**162**
V-ø	32	6	9	7	36	12	23	27	**52**
V-s	53	10	1	1	0	0	4	5	**16**
V-ed	0	0	1	1	0	0	2	2	**3**
V-irreg	16	3	0	0	0	0	4	5	**8**
perfect	0	0	0	0	0	0	2	2	**2**
other	0	0	1	1	6	2	5	6	**9**
Total	**100**	**19**	**100**	**82**	**100**	**33**	**100**	**118**	**252**

Table 4.33: Tokens Group 1 – Distribution of verb morphology by lexical aspect and foreground (FG); STAi: inchoative states, ACTi: inchoative activities

FG Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	1	1	7	3	2	4	**8**
V-ø	53	16	29	21	24	11	22	41	**89**
V-s	33	10	60	43	58	26	44	84	**163**
V-ed	0	0	7	5	11	5	11	21	**31**
V-irreg	10	3	3	2	0	0	18	34	**39**
perfect	0	0	0	0	0	0	1	1	**1**
other	3	1	0	0	0	0	3	5	**6**
Total	**100**	**30**	**100**	**72**	**100**	**45**	**100**	**190**	**337**

Table 4.34: Tokens Group 2 – Distribution of verb morphology by lexical aspect and foreground (FG); STAi: inchoative states, ACTi: inchoative activities

FG Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	3	4	6	5	1	2	**11**
V-ø	71	32	36	47	52	41	30	86	**206**
V-s	9	4	8	11	16	13	17	49	**77**
V-ed	2	1	48	63	20	16	20	57	**137**
V-irreg	16	7	2	2	5	4	32	90	**103**
perfect	0	0	0	0	0	0	0	0	**0**
other	2	1	2	3	0	0	0	1	**5**
Total	**100**	**45**	**100**	**130**	**100**	**79**	**100**	**285**	**539**

Table 4.35: Tokens Group 3 – Distribution of verb morphology by lexical aspect and foreground (FG); STAi: inchoative states, ACTi: inchoative activities

FG Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	7	7	10	8	2	7	**22**
V-ø	6	4	6	6	12	10	13	36	**56**
V-s	1	1	1	1	12	10	10	29	**41**
V-ed	25	17	80	78	33	27	36	105	**227**
V-irreg	68	47	5	5	31	25	38	108	**185**
perfect	0	0	0	0	0	0	0	0	**0**
other	0	0	0	0	1	1	1	3	**4**
Total	**100**	**69**	**100**	**97**	**100**	**81**	**100**	**288**	**535**

Table 4.36: Tokens Group 4 – Distribution of verb morphology by lexical aspect and foreground (FG); STAi: inchoative states, ACTi: inchoative activities

Background:

BG Form	STA %	(n)	ACT %	(n)	ACC_{-i} %	(n)	ACH_{-i} %	(n)	Verbs (n)
V-ing	0	0	83	20	0	0	25	1	**21**
V-ø	25	2	17	4	0	0	0	0	**6**
V-s	63	5	0	0	0	0	25	1	**6**
V-ed	0	0	0	0	0	0	0	0	**0**
V-irreg	13	1	0	0	0	0	0	0	**1**
perfect	0	0	0	0	0	0	25	1	**1**
other	0	0	0	0	0	0	25	1	**1**
Total	**100**	**8**	**100**	**24**	**0**	**0**	**100**	**4**	**36**

Table 4.37: Tokens Group 1 – Distribution of verb morphology by lexical aspect and background (BG); ACC-i: non inchoative accomplishments, ACH-i: non inchoative achievements

BG Form	STA %	(n)	ACT %	(n)	ACC_{-i} %	(n)	ACH_{-i} %	(n)	Verbs (n)
V-ing	0	0	39	13	0	0	6	1	**14**
V-ø	20	4	18	6	50	2	6	1	**13**
V-s	75	15	36	12	0	0	11	2	**29**
V-ed	0	0	3	1	0	0	17	3	**4**
V-irreg	5	1	3	1	0	0	6	1	**3**
perfect	0	0	0	0	50	2	44	8	**10**
other	0	0	0	0	0	0	11	2	**2**
Total	**100**	**20**	**100**	**33**	**100**	**4**	**100**	**18**	**75**

Table 4.38: Tokens Group 2 – Distribution of verb morphology by lexical aspect and background (BG); ACC-i: non inchoative accomplishments, ACH-i: non inchoative achievements

BG Form	STA %	(n)	ACT %	(n)	ACC-i %	(n)	ACH-i %	(n)	Verbs (n)
V-ing	0	0	38	17	0	0	8	1	**18**
V-ø	23	3	29	13	0	0	8	1	**17**
V-s	15	2	2	1	0	0	15	2	**5**
V-ed	0	0	18	8	0	0	0	0	**8**
V-irreg	46	6	4	2	0	0	23	3	**11**
perfect	8	1	4	2	0	0	46	6	**9**
other	8	1	4	2	0	0	0	0	**3**
Total	**100**	**13**	**100**	**45**	**0**	**0**	**100**	**13**	**71**

Table 4.39: Tokens Group 3 – Distribution of verb morphology by lexical aspect and background (BG); ACC-i: non inchoative accomplishments, ACH-i: non inchoative achievements

BG Form	STA %	(n)	ACT %	(n)	ACC-i %	(n)	ACH-i %	(n)	Verbs (n)
V-ing	3	1	17	5	0	0	0	0	**6**
V-ø	21	7	23	7	0	0	0	0	**14**
V-s	21	7	13	4	0	0	11	2	**13**
V-ed	3	1	17	5	0	0	17	3	**9**
V-irreg	44	15	23	7	0	0	17	3	**25**
perfect	0	0	0	0	0	0	17	3	**3**
other	9	3	7	2	0	0	39	7	**12**
Total	**100**	**34**	**100**	**30**	**0**	**0**	**100**	**18**	**82**

Table 4.40: Tokens Group 4 – Distribution of verb morphology by lexical aspect and background (BG); ACC-i: non inchoative accomplishments, ACH-i: non inchoative achievements

¬Focus:

¬FOC Form	STA$_i$ %	(n)	ACT$_i$ %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	86	19	53	8	75	12	**39**
V-ø	100	2	9	2	33	5	6	1	**10**
V-s	0	0	5	1	0	0	13	2	**3**
V-ed	0	0	0	0	0	0	6	1	**1**
V-irreg	0	0	0	0	0	0	0	0	**0**
perfect	0	0	0	0	0	0	0	0	**0**
other	0	0	0	0	13	2	0	0	**2**
Total	**100**	**2**	**100**	**22**	**100**	**15**	**100**	**16**	**55**

Table 4.41: Tokens Group 1 – Distribution of verb morphology by lexical aspect and ¬focus (¬FOC); STAi: inchoative states, ACTi: inchoative activities

¬FOC Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	9	3	10	1	0	0	**4**
V-ø	38	3	26	9	30	3	38	9	**24**
V-s	63	5	60	21	60	6	38	9	**41**
V-ed	0	0	6	2	0	0	8	2	**4**
V-irreg	0	0	0	0	0	0	17	4	**4**
perfect	0	0	0	0	0	0	0	0	**0**
other	0	0	0	0	0	0	0	0	**0**
Total	**100**	**8**	**100**	**35**	**100**	**10**	**100**	**24**	**77**

Table 4.42: Tokens Group 2 – Distribution of verb morphology by lexical aspect and ¬focus (¬FOC); STAi: inchoative states, ACTi: inchoative activities

¬FOC Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	0	0	0	0	0	0	**0**
V-ø	100	1	29	12	0	0	22	7	**20**
V-s	0	0	10	4	17	1	41	13	**18**
V-ed	0	0	44	18	50	3	13	4	**25**
V-irreg	0	0	15	6	33	2	25	8	**16**
perfect	0	0	2	1	0	0	0	0	**1**
other	0	0	0	0	0	0	0	0	**0**
Total	**100**	**1**	**100**	**41**	**100**	**6**	**100**	**32**	**80**

Table 4.43: Tokens Group 3 – Distribution of verb morphology by lexical aspect and ¬focus (¬FOC); STAi: inchoative states, ACTi: inchoative activities

¬FOC Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	15	6	8	1	0	0	**7**
V-ø	11	1	2	1	0	0	0	0	**2**
V-s	0	0	17	7	15	2	5	1	**10**
V-ed	89	8	56	23	62	8	58	11	**50**
V-irreg	0	0	10	4	15	2	26	5	**11**
perfect	0	0	0	0	0	0	5	1	**1**
other	0	0	0	0	0	0	5	1	**1**
Total	**100**	**9**	**100**	**41**	**100**	**13**	**100**	**19**	**82**

Table 4.44: Tokens Group 4 – Distribution of verb morphology by lexical aspect and ¬focus (¬FOC); STA_i: inchoative states, ACT_i: inchoative activities

Type Analysis

Finally, the results of the type analysis with respect to the combined predictions of the AH and the DH are presented below.

Foreground:

FG Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	0	0	0	0	47	18	**18**
V-ø	33	2	33	2	33	2	21	8	**14**
V-s	50	3	50	3	50	3	8	3	**12**
V-ed	0	0	0	0	0	0	5	2	**2**
V-irreg	17	1	17	1	17	1	5	2	**5**
perfect	0	0	0	0	0	0	3	1	**1**
other	0	0	0	0	0	0	11	4	**4**
Total	**100**	**4**	**100**	**4**	**100**	**4**	**100**	**23**	**35**

Table 4.45: Types Group 1 – Distribution of verb morphology by lexical aspect and foreground (FG); STAi: inchoative states, ACTi: inchoative activities

FG Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	5	1	14	2	2	1	**4**
V-ø	27	3	38	8	43	6	22	13	**30**
V-s	36	4	43	9	36	5	38	22	**40**
V-ed	0	0	5	1	7	1	17	10	**12**
V-irreg	27	3	10	2	0	0	14	8	**13**
perfect	0	0	0	0	0	0	2	1	**1**
other	9	1	0	0	0	0	5	3	**4**
Total	**100**	**5**	**100**	**12**	**100**	**8**	**100**	**27**	**52**

Table 4.46: Types Group 2 – Distribution of verb morphology by lexical aspect and foreground (FG); STAi: inchoative states, ACTi: inchoative activities

FG Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	11	4	12	2	3	2	**8**
V-ø	33	4	34	13	35	6	40	25	**48**
V-s	25	3	21	8	29	5	22	14	**30**
V-ed	8	1	21	8	12	2	19	12	**23**
V-irreg	25	3	5	2	12	2	14	9	**16**
perfect	0	0	0	0	0	0	0	0	**0**
other	8	1	8	3	0	0	2	1	**5**
Total	**100**	**6**	**100**	**26**	**100**	**8**	**100**	**32**	**72**

Table 4.47: Types Group 3 – Distribution of verb morphology by lexical aspect and foreground (FG); STAi: inchoative states, ACTi: inchoative activities

FG Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0		27	6	12	3	5	4	**13**
V-ø	20	2	18	4	16	4	22	18	**28**
V-s	10	1	5	1	24	6	16	13	**21**
V-ed	20	2	32	7	16	4	30	25	**38**
V-irreg	50	5	18	4	28	7	23	19	**35**
perfect	0		0		0		0		**0**
other	0		0		4	1	4	3	**4**
Total	**100**	**6**	**100**	**16**	**100**	**13**	**100**	**46**	**81**

Table 4.48: Types Group 4 – Distribution of verb morphology by lexical aspect and foreground (FG); STAi: inchoative states, ACTi: inchoative activities

Background:

BG Form	STA %	(n)	ACT %	(n)	ACC_{-i} %	(n)	ACH_{-i} %	(n)	Verbs (n)
V-ing	0	0	75	6	0	0	25	1	**7**
V-ø	25	1	25	2	0	0	0	0	**3**
V-s	50	2	0	0	0	0	25	1	**3**
V-ed	0	0	0	0	0	0	0	0	**0**
V-irreg	25	1	0	0	0	0	0	0	**1**
perfect	0	0	0	0	0	0	25	1	**1**
other	0	0	0	0	0	0	25	1	**1**
Total	**100**	**2**	**100**	**6**	**0**	**0**	**100**	**4**	**12**

Table 4.49: Types Group 1 – Distribution of verb morphology by lexical aspect and background (BG); ACC_{-i}: non inchoative accomplishments, ACH_{-i}: non inchoative achievements

BG Form	STA %	(n)	ACT %	(n)	ACC_{-i} %	(n)	ACH_{-i} %	(n)	Verbs (n)
V-ing	0	0	41	7	0	0	7	1	**8**
V-ø	33	2	18	3	33	1	7	1	**7**
V-s	50	3	29	5	0	0	7	1	**9**
V-ed	0	0	6	1	0	0	13	2	**3**
V-irreg	17	1	6	1	0	0	7	1	**3**
perfect	0	0	0	0	67	2	47	7	**9**
other	0	0	0	0	0	0	13	2	**2**
Total	**100**	**3**	**100**	**9**	**100**	**2**	**100**	**10**	**24**

Table 4.50: Types Group 2 – Distribution of verb morphology by lexical aspect and background (BG); ACC_{-i}: non inchoative accomplishments, ACH_{-i}: non inchoative achievements

BG Form	STA %	(n)	ACT %	(n)	ACC_{-i} %	(n)	ACH_{-i} %	(n)	Verbs (n)
V-ing	0	0	32	7	0	0	10	1	**8**
V-ø	33	2	27	6	0	0	10	1	**9**
V-s	17	1	5	1	0	0	20	2	**4**
V-ed	0	0	9	2	0	0	0	0	**2**
V-irreg	33	2	9	2	0	0	30	3	**7**
perfect	17	1	9	2	0	0	30	3	**6**
other	0	0	9	2	0	0	0	0	**2**
Total	**100**	**3**	**100**	**13**	**0**	**0**	**100**	**7**	**23**

Table 4.51: Types Group 3 – Distribution of verb morphology by lexical aspect and background (BG); ACC_{-i}: non inchoative accomplishments, ACH_{-i}: non inchoative achievements

BG Form	STA %	(n)	ACT %	(n)	ACC_{-i} %	(n)	ACH_{-i} %	(n)	Verbs (n)
V-ing	7	1	16	3	0	0	0	0	**4**
V-ø	29	4	26	5	0	0	0	0	**9**
V-s	21	3	16	3	0	0	8	1	**7**
V-ed	7	1	16	3	0	0	23	3	**7**
V-irreg	21	3	16	3	0	0	15	2	**8**
perfect	0		0		0	0	23	3	**3**
other	14	2	11	2	0	0	31	4	**8**
Total	**100**	**8**	**100**	**10**	**0**	**0**	**100**	**7**	**25**

Table 4.52: Types Group 4 – Distribution of verb morphology by lexical aspect and background (BG); ACC_{-i}: non inchoative accomplishments, ACH_{-i}: non inchoative achievements

¬Focus:

¬FOC Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	73	8	44	4	73	8	**20**
V-ø	100	2	18	2	33	3	9	1	**8**
V-s	0	0	9	1	0	0	9	1	**2**
V-ed	0	0	0	0	0	0	9	1	**1**
V-irreg	0	0	0	0	0	0	0	0	**0**
perfect	0	0	0	0	0	0	0	0	**0**
other	0	0	0	0	22	2	0	0	**2**
Total	**100**	**2**	**100**	**10**	**100**	**5**	**100**	**8**	**25**

Table 4.53: Types Group 1 – Distribution of verb morphology by lexical aspect and ¬focus (¬FOC); STA_i: inchoative states, ACT_i: inchoative activities

¬FOC Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	19	3	17	1	0	0	**4**
V-ø	50	2	38	6	17	1	38	5	**14**
V-s	50	2	38	6	67	4	31	4	**16**
V-ed	0	0	6	1	0	0	8	1	**2**
V-irreg	0	0	0	0	0	0	23	3	**3**
perfect	0	0	0	0	0	0	0	0	**0**
other	0	0	0	0	0	0	0	0	**0**
Total	**100**	**2**	**100**	**11**	**100**	**4**	**100**	**8**	**25**

Table 4.54: Types Group 2 – Distribution of verb morphology by lexical aspect and ¬focus (¬FOC); STA_i: inchoative states, ACT_i: inchoative activities

¬FOC Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	0	0	0	0	0	0	**0**
V-ø	100	1	37	7	0	0	32	6	**14**
V-s	0	0	16	3	20	1	32	6	**10**
V-ed	0	0	26	5	40	2	21	4	**11**
V-irreg	0	0	16	3	40	2	16	3	**8**
perfect	0	0	5	1	0	0	0	0	**1**
other	0	0	0	0	0	0	0	0	**0**
Total	**100**	**1**	**100**	**13**	**100**	**5**	**100**	**11**	**30**

Table 4.55: Types Group 3 – Distribution of verb morphology by lexical aspect and ¬focus (¬FOC); STA_i: inchoative states, ACT_i: inchoative activities

¬FOC Form	STA_i %	(n)	ACT_i %	(n)	ACC %	(n)	ACH %	(n)	Verbs (n)
V-ing	0	0	24	4	17	1	0	0	**5**
V-ø	50	1	6	1	0	0	0	0	**2**
V-s	0	0	29	5	33	2	7	1	**8**
V-ed	50	1	24	4	17	1	43	6	**12**
V-irreg	0	0	18	3	33	2	36	5	**10**
perfect	0	0	0	0	0	0	7	1	**1**
other	0	0	0	0	0	0	7	1	**1**
Total	**100**	**1**	**100**	**11**	**100**	**3**	**100**	**12**	**27**

Table 4.56: Types Group 4 – Distribution of verb morphology by lexical aspect and ¬focus (¬FOC); STA_i: inchoative states, ACT_i: inchoative activities

4.5.5. Significance test

Ordered thus, the data of the individual transcripts were added in tables according to the respective groups, and a token and type analysis was carried out for all groups on the same variables used for the individual transcripts. The results of these two analyses are presented in chapter 4. To determine whether the observed effects are statistically significant, a T-Test for dependent samples was applied to the data using SPSS. The conditions for a T-Test were met; the sample was large enough to account for a normal distribution (70 transcripts), and the variables in this analysis were dependent as different variables were tested over one transcript. The T-Test compares the mean of different groups and tests the two hypotheses:

H0: there is no difference between the variables

H1: there is a difference between the variables

The T-Test yields a probabilistic result as to whether H0 can be rejected. The level of statistical significance indicates the probability of whether the difference between two groups due to chance or not. The level of significance used in this analysis is 5% (represented as $p<.05$), which indicates 95% of confidence that the differences between the variables under scrutiny are not merely coincidental (Brown & Rodgers 2002, Woods et al. 1993).

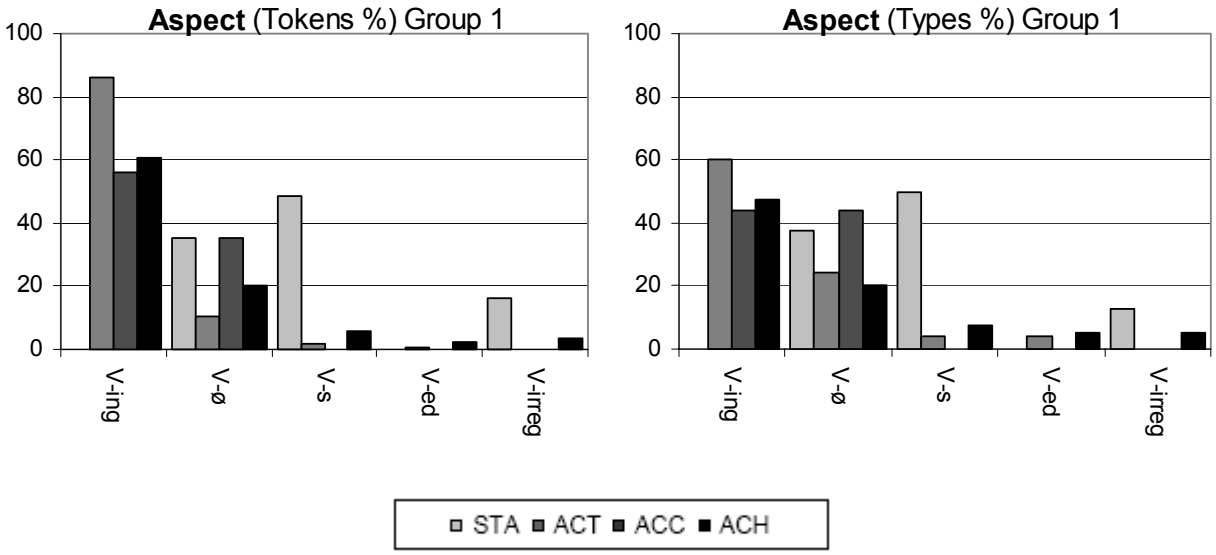
5. Results and discussion

This chapter presents the results of the group analysis of both the token and the type count. The first part shows the graphic representation of the aspect and the discourse analysis. The numerical results underlying the graphs are presented in section 4.5.4 above. In the second part of this chapter, the observed effects are discussed with respect to the predictions of the Aspect Hypothesis and the Discourse Hypothesis.

Altogether, the children used 154 verb lexemes in all transcripts. (A list including the lexical aspect category of each lexeme in its predicative context is presented in section 3.2.3.5.) 46% (# 71) of all lexemes were classified as ACH, 31% (# 47) as ACT, 14% (# 21) as ACC, and 10% (# 15) as STA verbs. (For the aspect and discourse classification of all clauses, see online-appendix: www.wvttrier.de/downloads/kersten_online-appendix.pdf.)

5.1. Results of lexical aspect and grounding

Both a token and a type analysis were carried out on all transcripts. Both analyses highlight different aspects of the data. While the token count indicates the exact number of an inflection's occurrence in the group data, the type count neglects the repeated occurrence with the same lexeme. The effect of this difference becomes clear when comparing, for instance, the results for V-ing with ACT in Group 1 (Figure 5.1).



Group 1 (Tokens)									
Distribution of verb morphology within aspectual categories									
Form	STA		ACT		ACC		ACH		Verbs
	%	(n)	%	(n)	%	(n)	%	(n)	(n)
V-ing	0	0	86	119	56	27	61	84	**230**
V-ø	35	11	10	14	35	17	20	28	**70**
V-s	48	15	1	2	0	0	6	8	**25**
V-ed	0	0	1	1	0	0	2	3	**4**
V-irreg	16	5	0	0	0	0	4	5	**10**
perfect	0	0	1	1	0	0	2	3	**4**
other	0	0	1	1	8	4	5	7	**12**
Total	**100**	**31**	**100**	**138**	**100**	**48**	**100**	**138**	**355**

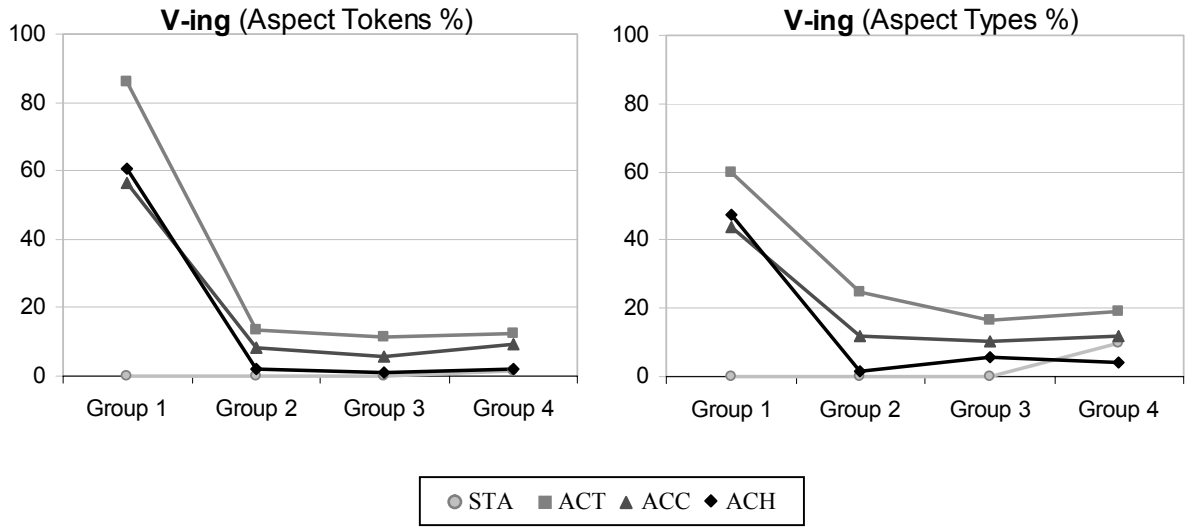
Group 1 (Types)									
Distribution of verb morphology within aspectual categories									
Form	STA		ACT		ACC		ACH		Verbs
	%	(n)	%	(n)	%	(n)	%	(n)	(n)
V-ing	0	0	60	15	44	7	48	19	**41**
V-ø	38	3	24	6	44	7	20	8	**24**
V-s	50	4	4	1	0	0	8	3	**8**
V-ed	0	0	4	1	0	0	5	2	**3**
V-irreg	13	1	0	0	0	0	5	2	**3**
perfect	0	0	4	1	0	0	3	1	**2**
other	0	0	4	1	13	2	13	5	**8**
Total	**100**	**5**	**100**	**17**	**100**	**10**	**100**	**24**	**56**

Figure 5.1: Verbal inflections with lexical aspect (Group 1) – comparison of tokens and types

While the token count shows that 86% of all ACT were inflected with -ing, this is only true 60% of all ACT types. The reason for this particular result is the inflated use of V-ing with some lexemes that occur frequently, such as look (# 58 / 119) and sit (# 24 / 119). The following graphic representation of the results shows the development of the Groups 1-4 for both the token and type analysis by inflection in comparison, for the use of verbal inflections with lexical aspect, grounding, and a combination of both. The graphs show the percentages of the group results for each lexical category using a within-category analysis. They are ordered by inflection type. The graphs thus give the answer to questions such as: "What percentage of all ACT verbs is inflected with V-ing"? The tables with the scores underlying the diagrams are presented in section 4.5.4. Underneath the graphs, the results of the statistical analysis are indicated (cf. section 4.5.5).[43] The T-Test takes the data of the individual transcripts, which are summarized by addition in the four developmental groups, into account. The graphs, on the other hand, illustrate the group results.

43 For reasons of clarity, the significance level is indicated below each diagram in section 5.1, while the detailed results of the T-Tests are documented in the appendix (p. 189ff).

5.1.1. V-ing



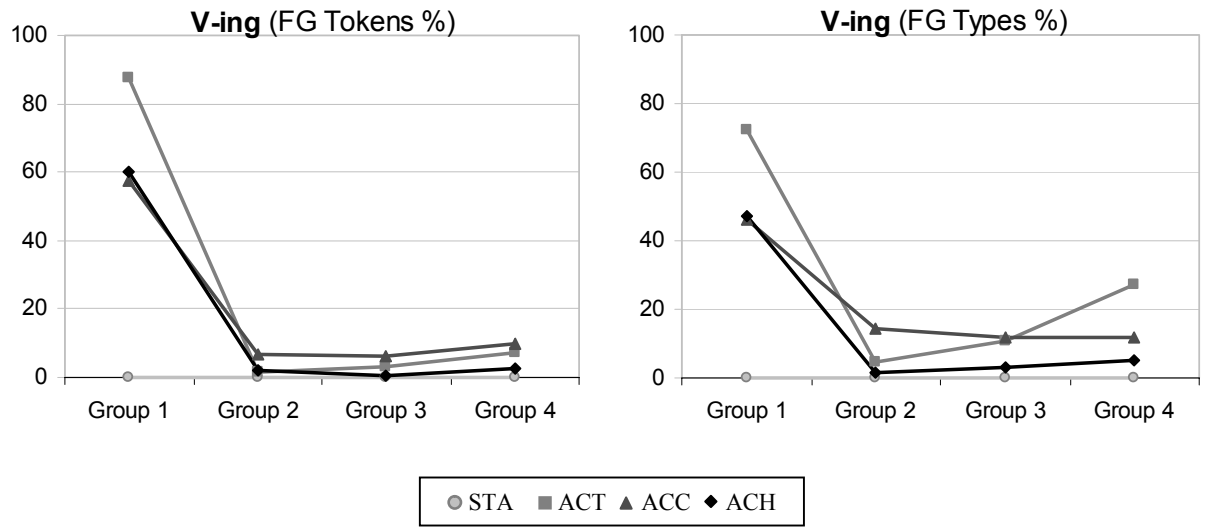
T-Test tokens: STA vs. ACT/ACC/ACH $p<.05$; ACT vs. ACC/ACH $p<.05$
T-Test types: STA vs. ACT/ACC/ACH $p<.05$; ACT vs. ACC/ACH $p<.05$

Figure 5.2: Development of Groups 1-4 V-ing with lexical aspect (%).

The pattern of V-ing with the four lexical aspectual categories is very characteristic. In the beginning of the acquisitional process (Group 1), -ing is used to a large extent with all categories except for STA. The following figures will show that no other inflection is used as frequently with all categories as V-ing in Group 1. As revealed by a T-Test, this difference is statistically significant. This finding is in accordance with other studies which date back to the morpheme order studies (cf. section 2.1). Throughout the whole sample both analyses show that V-ing is predominantly used with ACT, followed by ACC. The use of V-ing with ACH and STA, in contrast, is negligible. The strong usage with ACT, but not with ACC, is predicted by the AH.

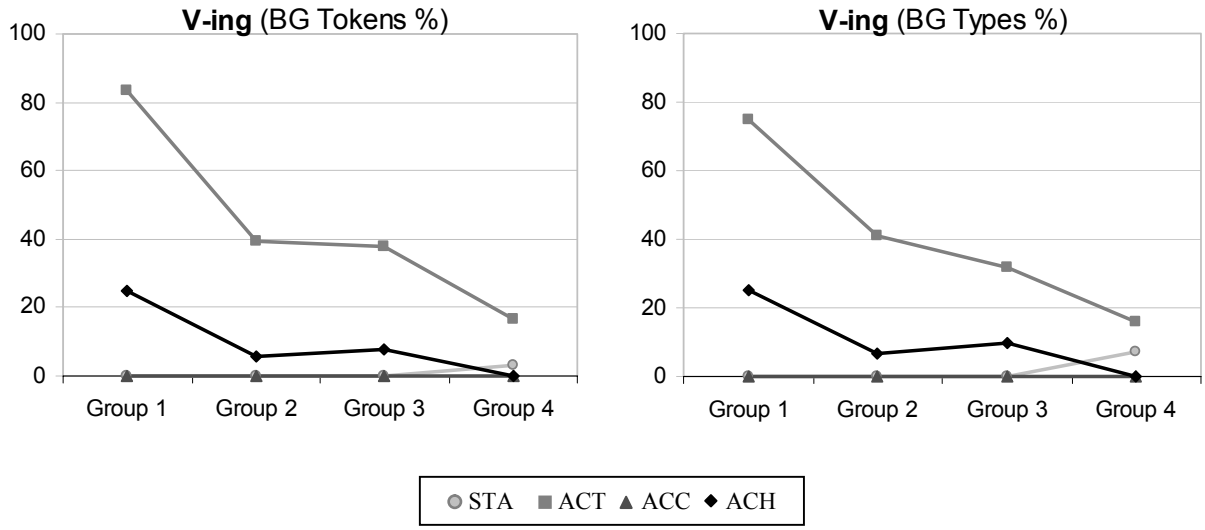
The following diagrams indicate how the use of -ing with the four categories is distributed over the different grounding environments, i.e. in the foreground (FG), in the background (BG) and in the clauses without focus (¬FOC).

a)



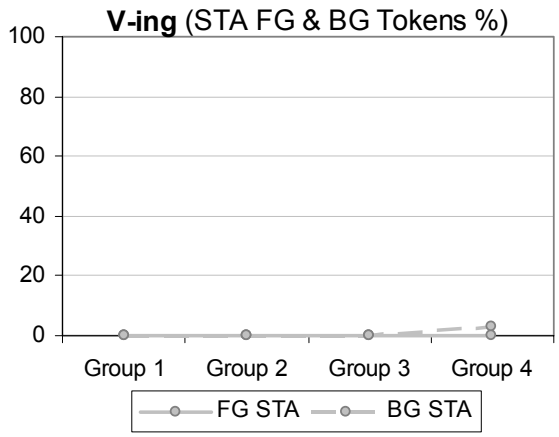
T-Test tokens: STA vs. ACT/ACC/ACH $p<.05$; ACT vs. ACH $p<.05$
T-Test types: STA vs. ACT/ACC/ACH $p<.05$; ACT vs. ACC/ACH $p<.05$

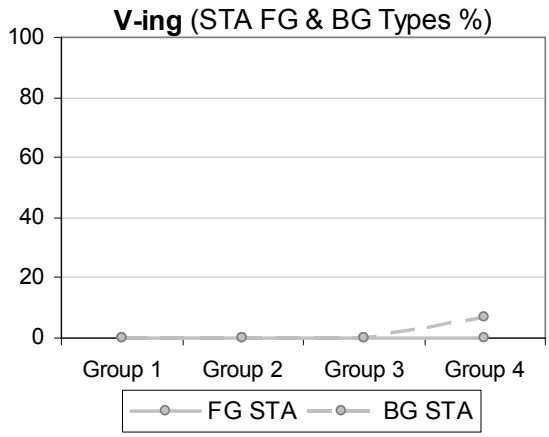
b)

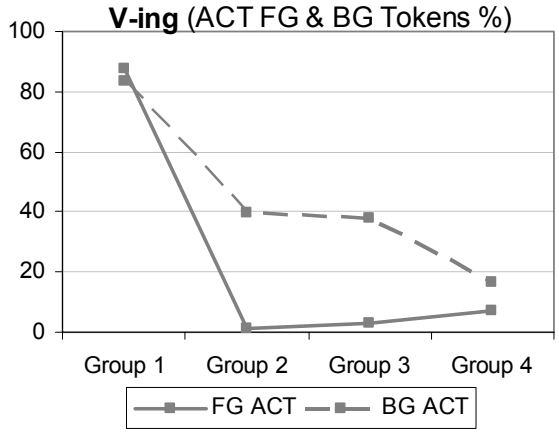


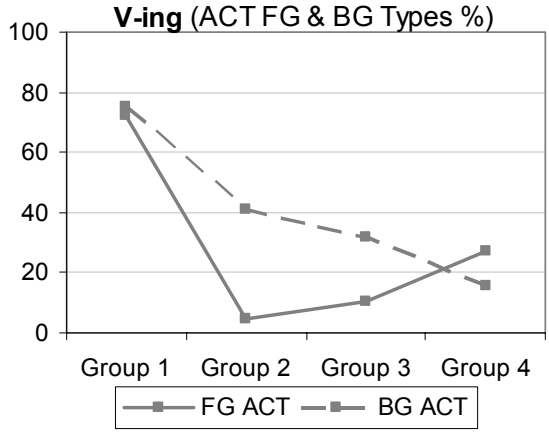
T-Test tokens: ACT vs. STA/ACC/ACH $p<.05$
T-Test types: ACT vs. STA/ACC/ACH $p<.05$

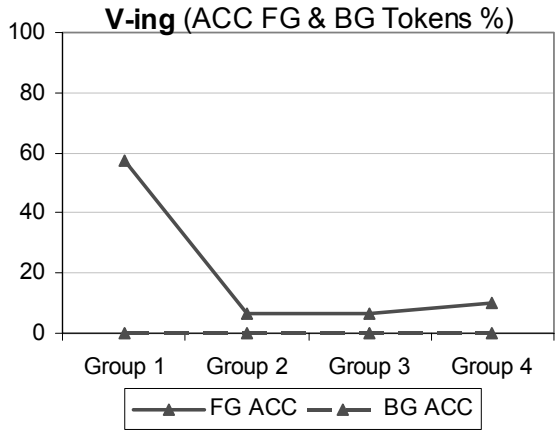
c)

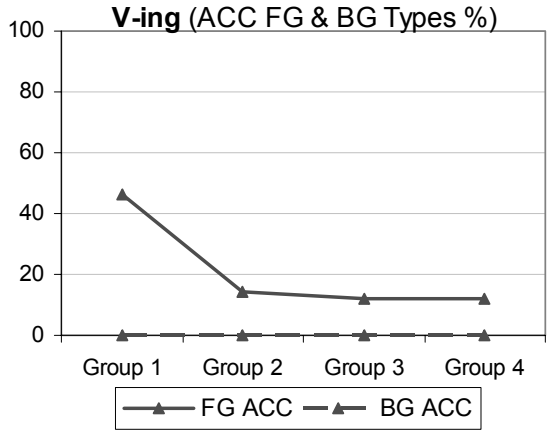

V-ing (STA FG & BG Tokens %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG STA
BG STA


V-ing (STA FG & BG Types %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG STA
BG STA


V-ing (ACT FG & BG Tokens %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACT
BG ACT


V-ing (ACT FG & BG Types %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACT
BG ACT


V-ing (ACC FG & BG Tokens %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACC
BG ACC


V-ing (ACC FG & BG Types %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACC
BG ACC

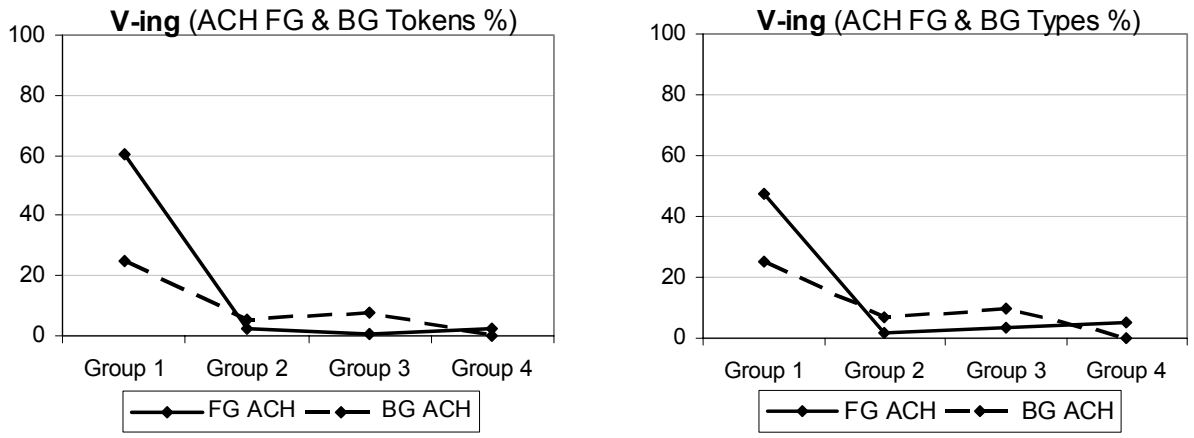
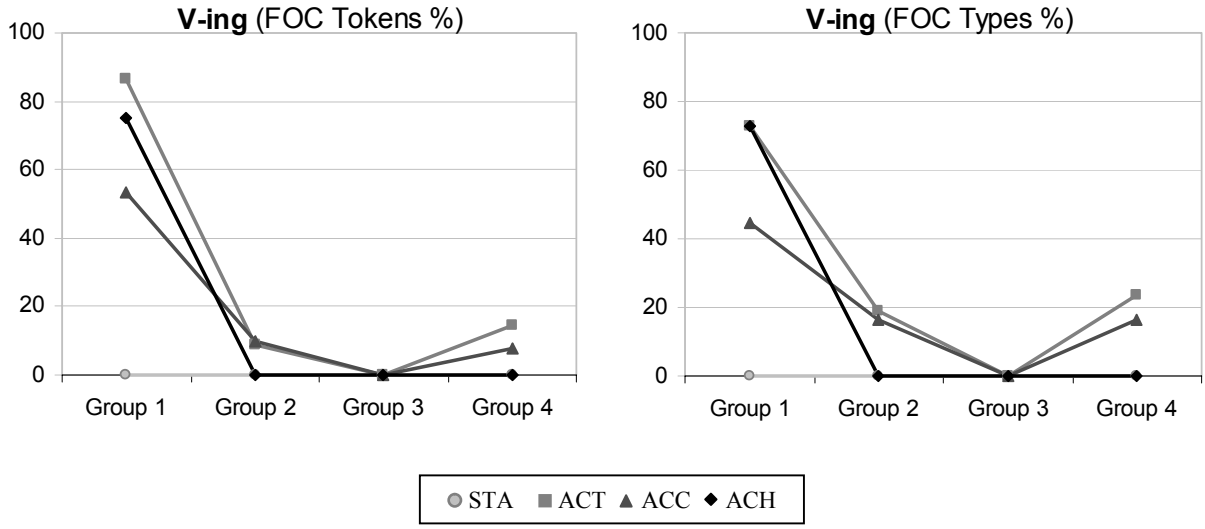


Figure 5.3: Development of Groups 1-4 V-ing with lexical aspect in a) foreground (%), b) background (%), c) foreground vs. background (%).

While STA and ACC do not appear in the background, ACT show a considerable effect: The usage is significantly higher in the background. As shown in Figure 5.3 c), in Group 1 this effect is diluted by the overall use of -ing in most contexts, and in Group 4 the results for FG and BG seem to converge again. Although the data for ACH seems to reveal a very slight effect as well in Groups 2-3, the number of tokens and types is too small to be conclusive. In Group 1, however, there is a reverse grounding effect in favor of the FG for ACH with V-ing.

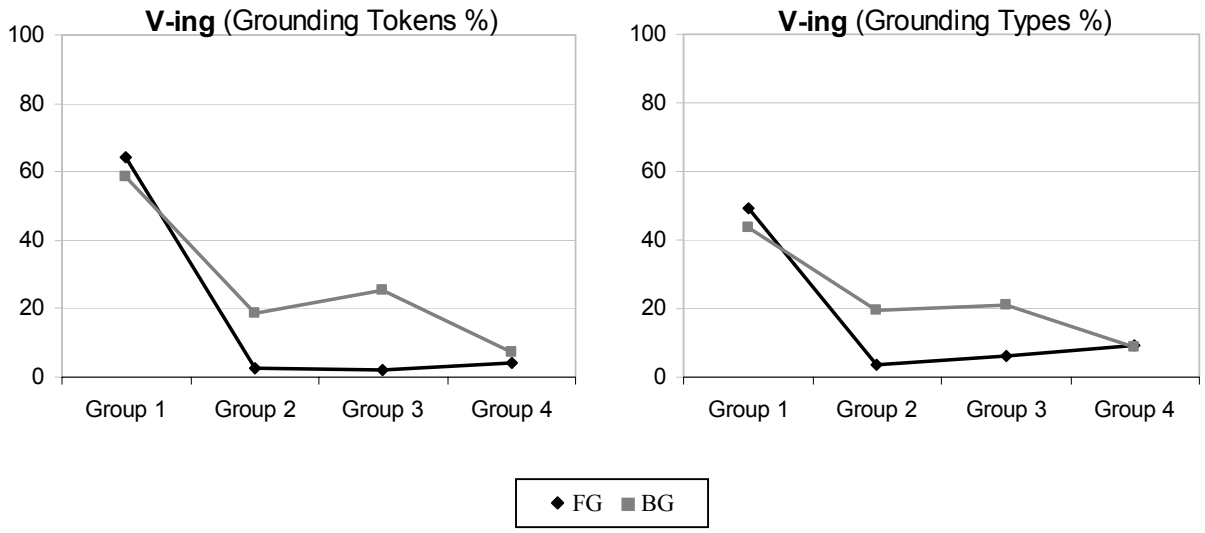


T-Test tokens: STA vs. ACT/ACC $p<.05$
T-Test types: STA vs. ACT/ACC $p<.05$

Figure 5.4: Development of Groups 1-4 V-ing with lexical aspect in ¬focus (%).

The pattern in the FOC contexts of V-ing (Figure 5.4) resembles the usage in the foreground much more strongly than that in the background (compare Figure 5.3, a) and

b). Figure 5.5 below shows the occurrences of V-ing in the two grounding contexts FG and BG without differentiating between the categories of lexical aspect.

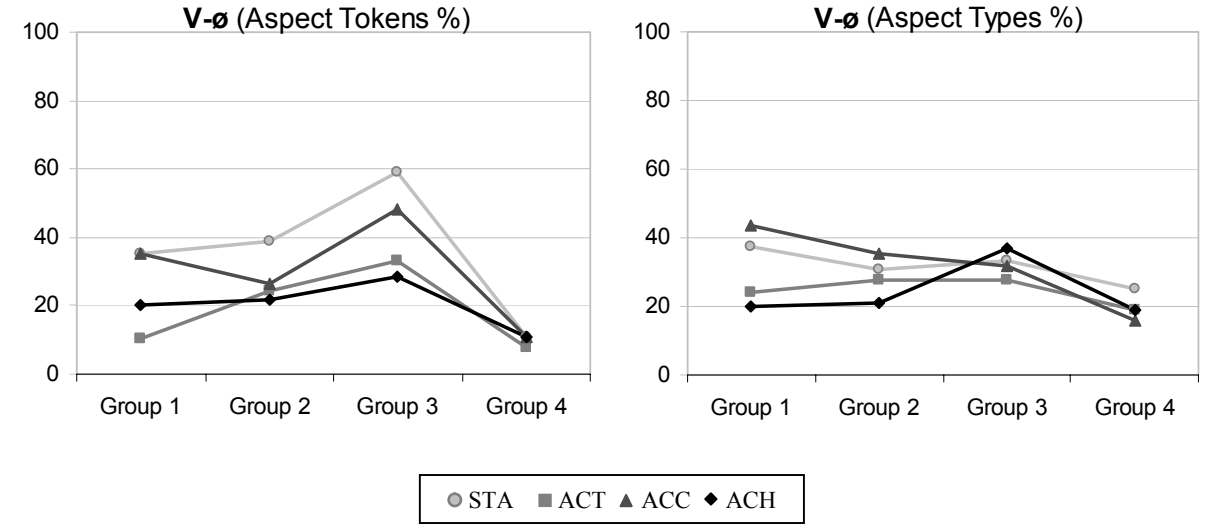


T-Test tokens: (p>.05)
T-Test types: (p>.05)

Figure 5.5: Development of Groups 1-4 V-ing with grounding (%).

Although the results are not statistically significant, the pictures show a clear tendency of a grounding effect in Groups 2-3 in favor of the BG. This was predicted by the discourse hypothesis. It seems, however, that this effect is dependent on the children's linguistic maturity, since the effect is neutralized in the last developmental group.

5.1.2. V-ø

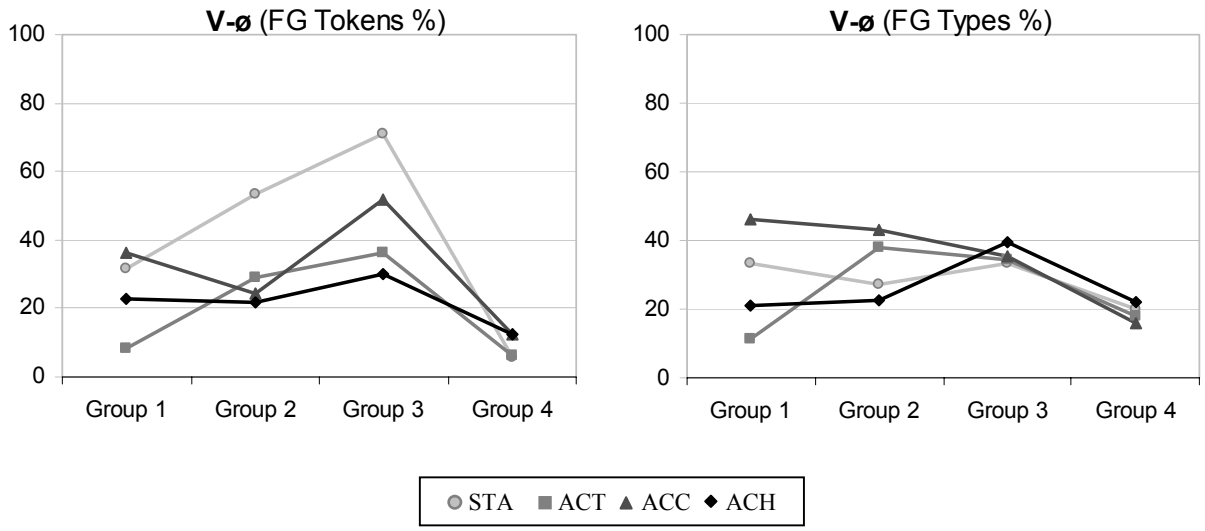


T-Test tokens: STA vs. ACT/ACH p<.05; ACT vs. ACC p<.05
T-Test types: STA vs. ACT/ACH p<.05

Figure 5.6: Development of Groups 1-4 V-ø with lexical aspect (%).

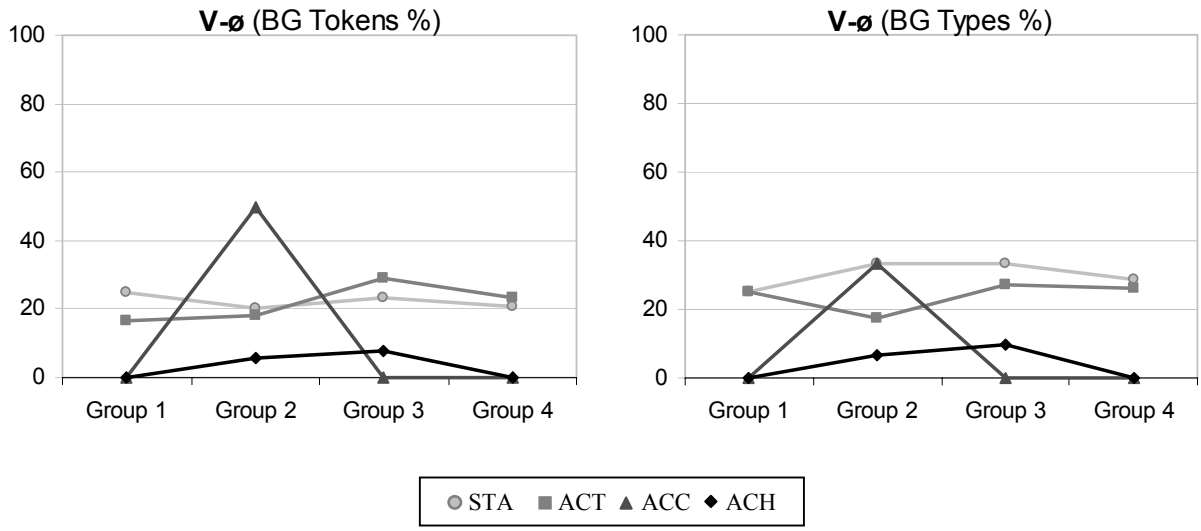
The pattern of the base form V-ø is not as homogenous as V-ing in the token- and the type analysis. It can be stated, however, that in the beginning stages (Groups 1-3 in the token analysis and Groups 1-2 with types), it is mostly STA (and ACC) which remain uninflected. The difference between STA and ACT/ACH is significant with both tokens and types. In reverse, this means that ACT and ACH are the categories which are most likely to be inflected in beginner's language. A tentative explanation might be found in the fact that STA are predicted to appear with V-s. According to the findings of Pienemann (1998) and others, V-s is the last inflection to emerge in the learner's interlanguage, as it requires the processing of interphrasal agreement. In contrast to this, the other inflections require a less complex processing procedure, i.e. phrasal agreement. This might be a reason why STA are the category which is least inflected in the beginning stages.

a)



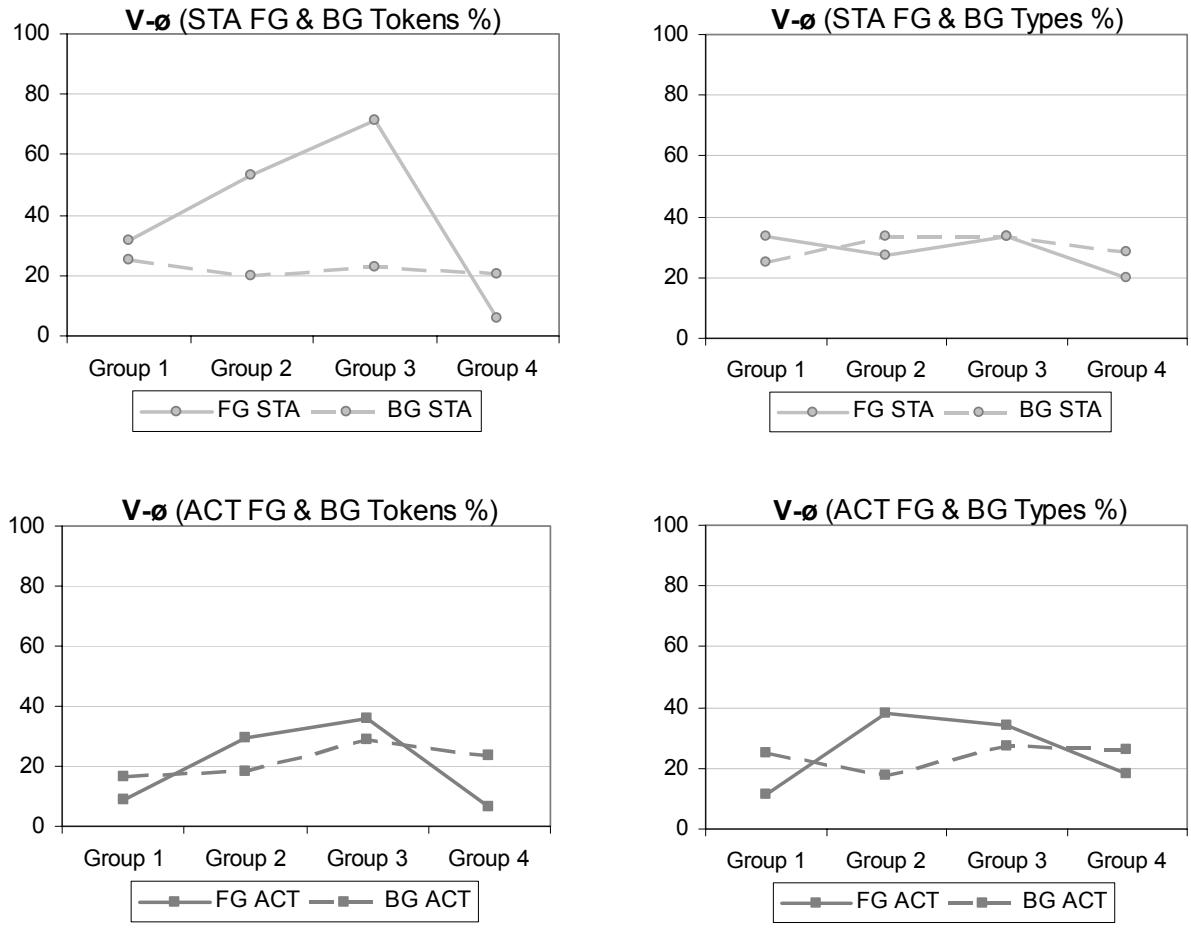
T-Test tokens: STA vs. ACT/ACH $p<.05$
T-Test types: STA vs. ACT $p<.05$

b)



T-Test tokens: ACT vs. ACC/ACH $p<.05$
T-Test types: ACT vs. ACC/ACH $p<.05$; STA vs. ACH $p<.05$

c)



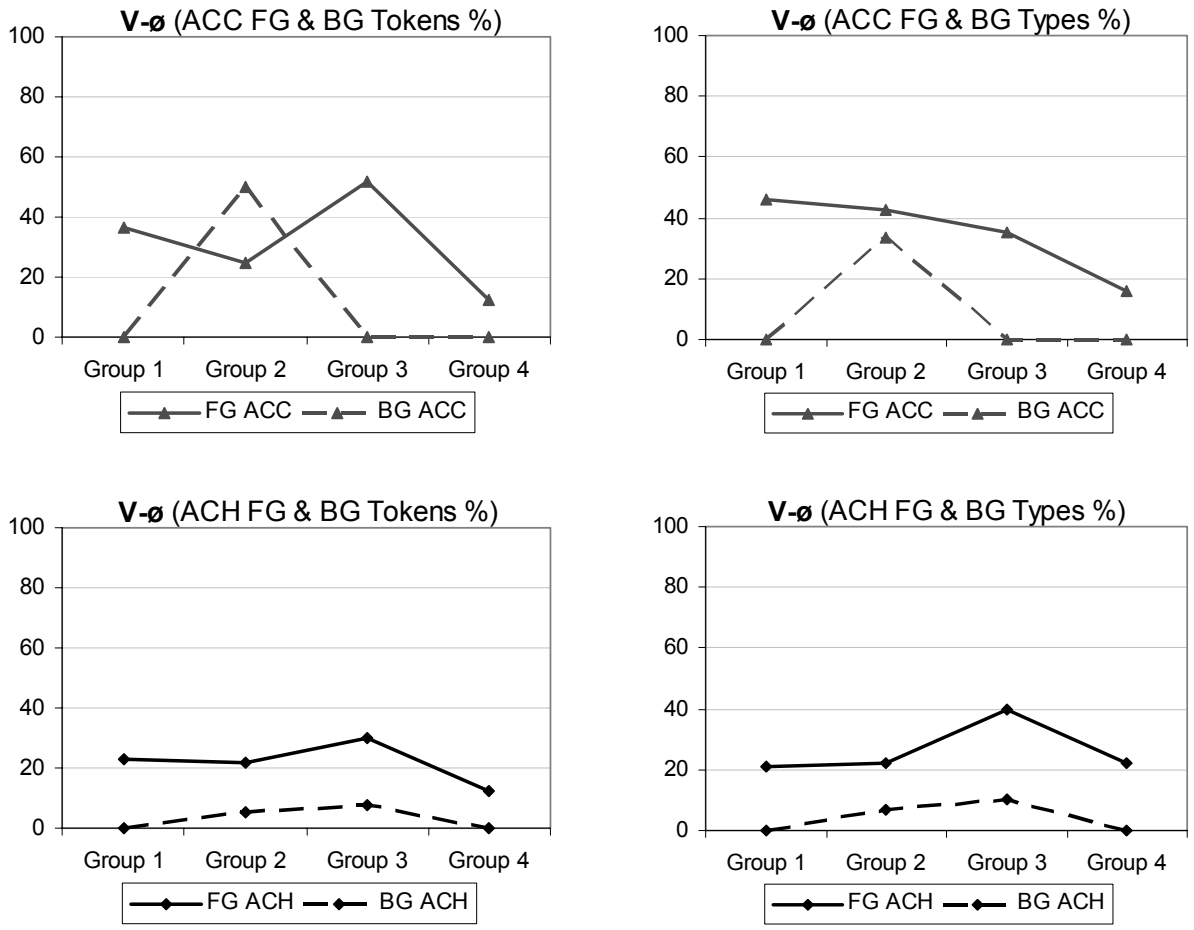
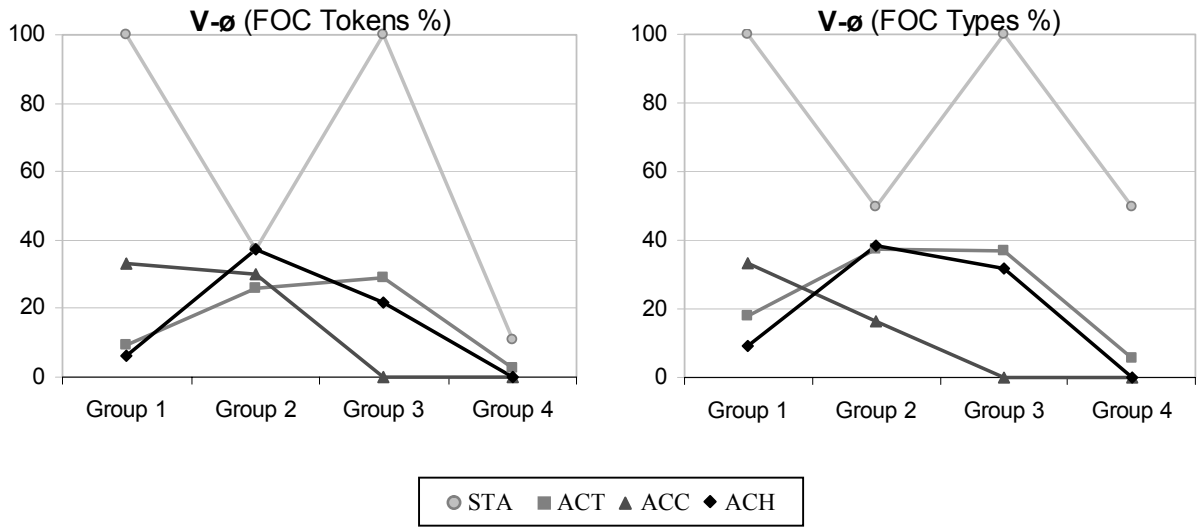


Figure 5.7: Development of Groups 1-4 V-ø with lexical aspect in a) foreground (%), b) background (%), c) foreground and background (%).

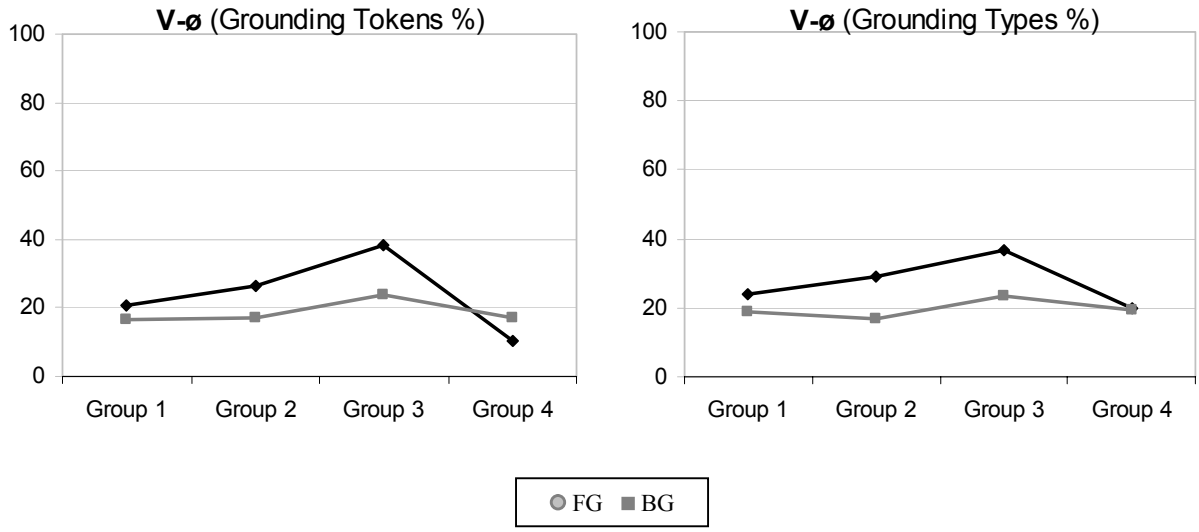
The distribution between foreground and background (Figure 5.7) remains somewhat inconclusive in the graphs, but the statistical analysis shows that the prevalence of STA is corroborated in the FG (and in the BG vs. ACH with types), whereas in the BG, ACT show a grounding effect. ACC do not appear in the BG except for Group 2. In the FOC contexts (Figure 5.8), ACT and ACH seem to be used similarly to the FG.



T-Test tokens: (p>.05)
T-Test types: (p>.05)

Figure 5.8: Development of Groups 1-4 V-ø with lexical aspect in ¬focus (%).

A clearer picture emerges, however, when comparing only FG and BG. Although not statistically significant, Figure 5.9 shows a tendency that in Groups 2 and 3 the base form is used to a higher extent in the foreground than in the background (p=.09 for types, cf. also V-s, Figure 5.13).

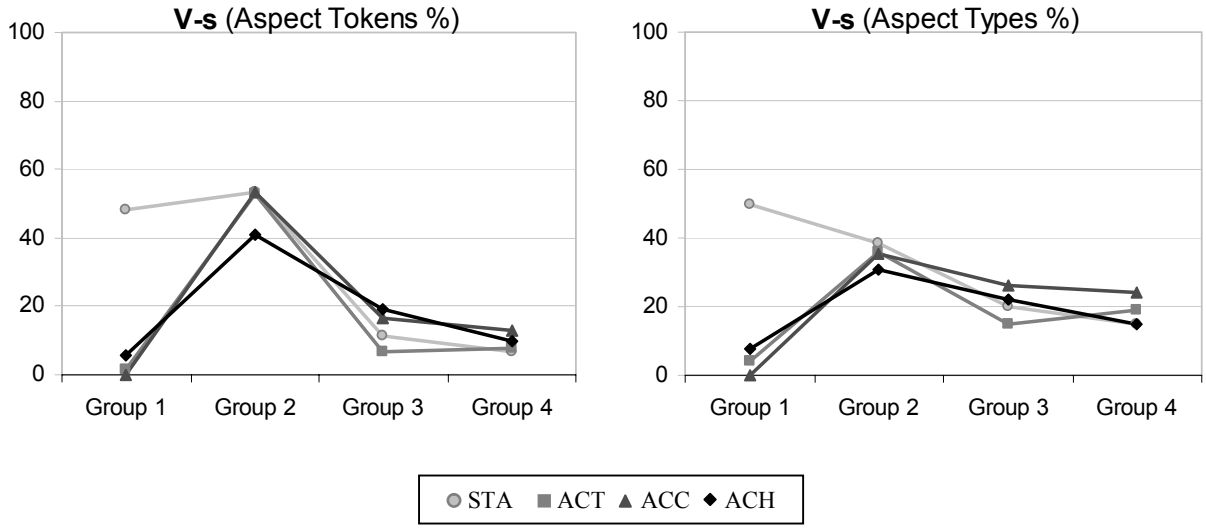


T-Test tokens: (p>.05)
T-Test types: (p>.05)

Figure 5.9: Development of Groups 1-4 V-ø with grounding (%).

This grounding effect has already been observed by Kumpf (1984) for a very inexperienced Japanese learner of English, and by Givón (1982) in his pidgin and creole studies. Véronique (1987), on the other hand, found a higher use of the base form in the background for intermediate learners. It is possible that Figure 5.9 captures both observations as a result of a developmental sequence, since the tendency of V-ø predominance in the FG is cancelled – and even reversed in the token count – in the most experienced developmental Group 4.

5.1.3. V-s



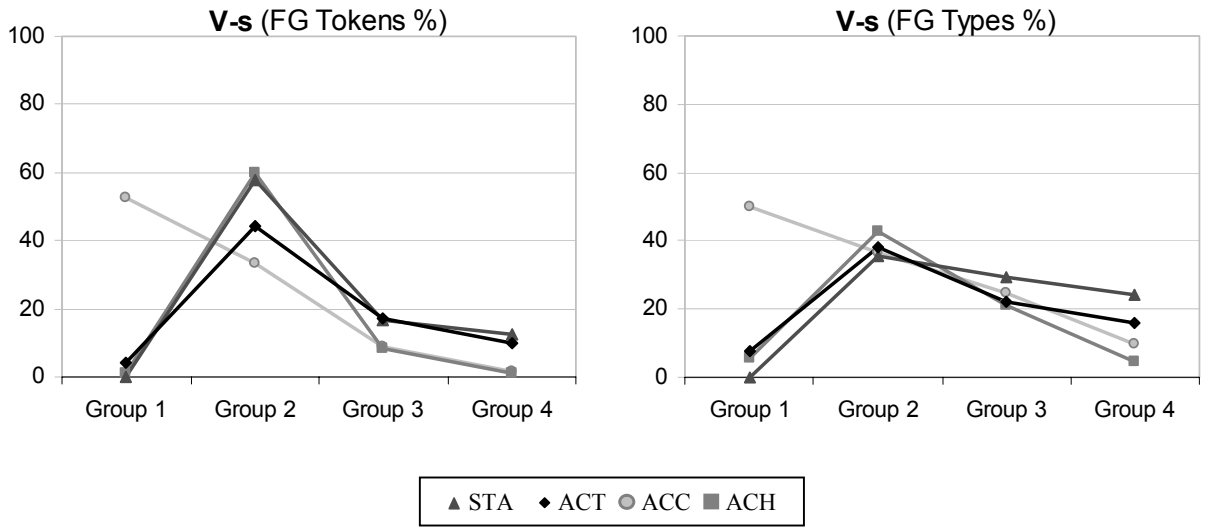
T-Test tokens: (p>.05)
T-Test types: (p>.05)

Figure 5.10: Development of Groups 1-4 V-s with lexical aspect (%).

V-s has predominantly been found with STA verbs in the literature (cf. section 2.2.2). This data set could confirm this finding only for the very first period of language acquisition (Group 1) in both the token and the type analysis. This result is actually in accordance with the findings by Kersten (2009a) on the emergence of V-s in a grammatical context (cf. section 2.2.2.3). As stated in that section, "the grammatical function of V-s is already in place in grade 2. The bulk of the grade 2 transcripts are assigned to the developmental Groups 2 and 3 in this analysis (Table 4.11). It should thus be expected that a pure aspectual effect for V-s will only become apparent in the data of Group 1, and that at later times the effect will be either diluted or even completely cancelled out by the grammatical function." This is exactly the effect observed in Figure 5.10.

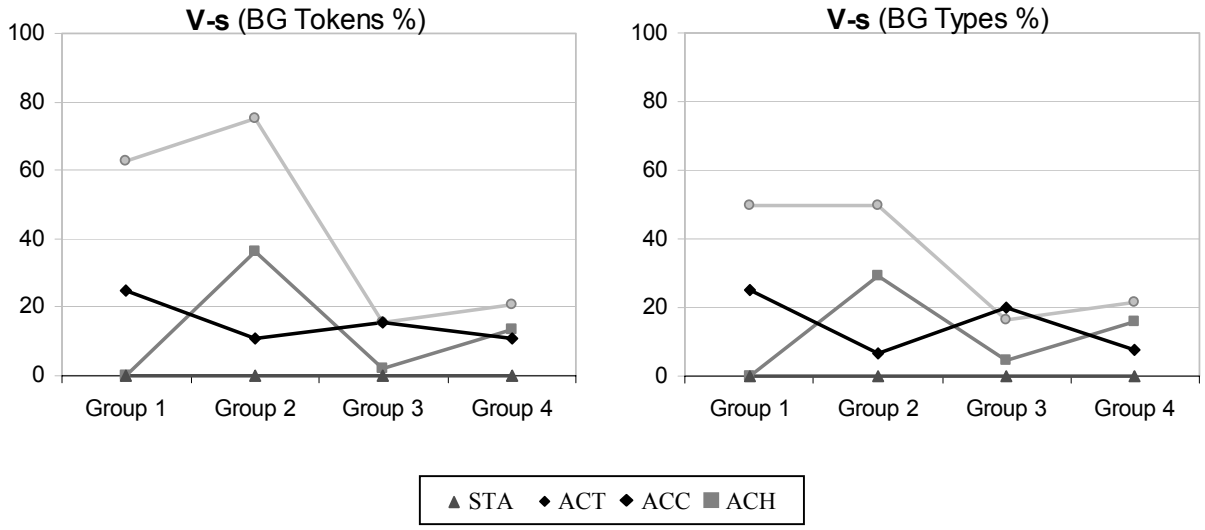
The differentiation between foreground and background reveals a very different picture (Figure 5.11).

a)



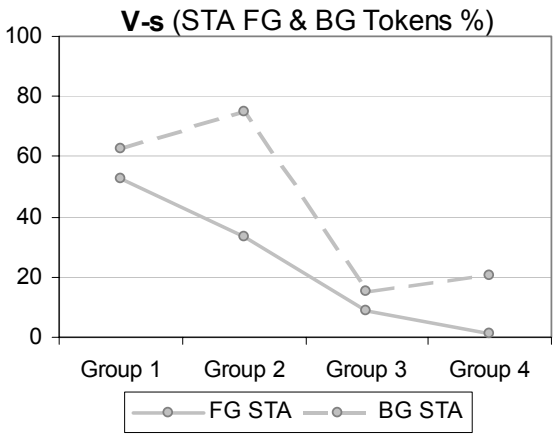
T-Test tokens: (p>.05)
T-Test types: (p>.05)

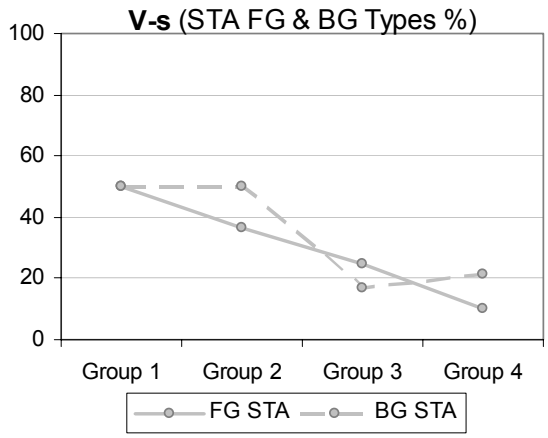
b)

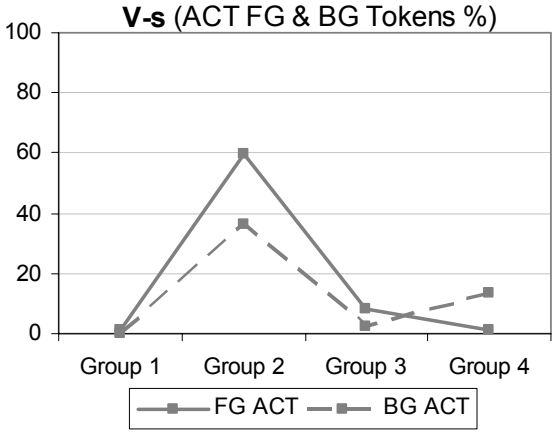


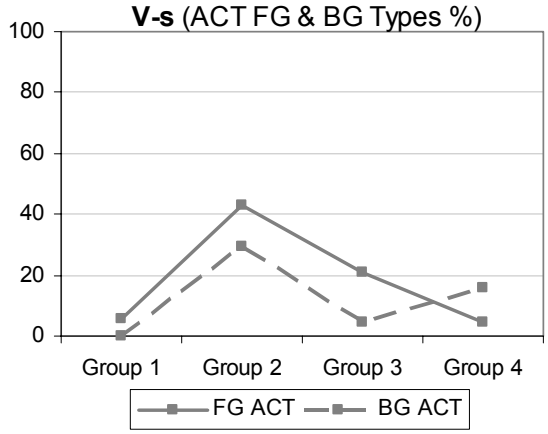
T-Test tokens: STA vs. ACT/ACC/ACH p<.05
T-Test types: STA vs. ACT/ACC/ACH p<.05

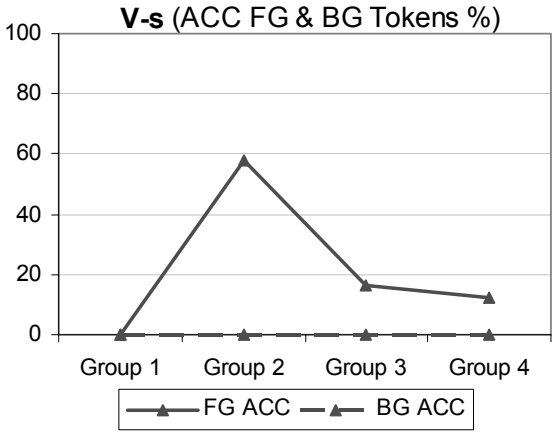
c)

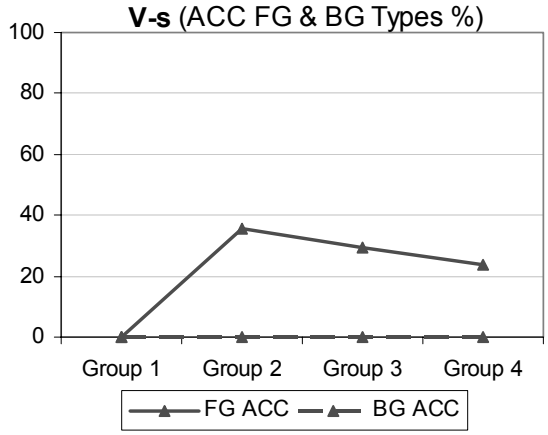

V-s (STA FG & BG Tokens %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG STA
BG STA


V-s (STA FG & BG Types %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG STA
BG STA


V-s (ACT FG & BG Tokens %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACT
BG ACT


V-s (ACT FG & BG Types %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACT
BG ACT


V-s (ACC FG & BG Tokens %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACC
BG ACC


V-s (ACC FG & BG Types %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACC
BG ACC

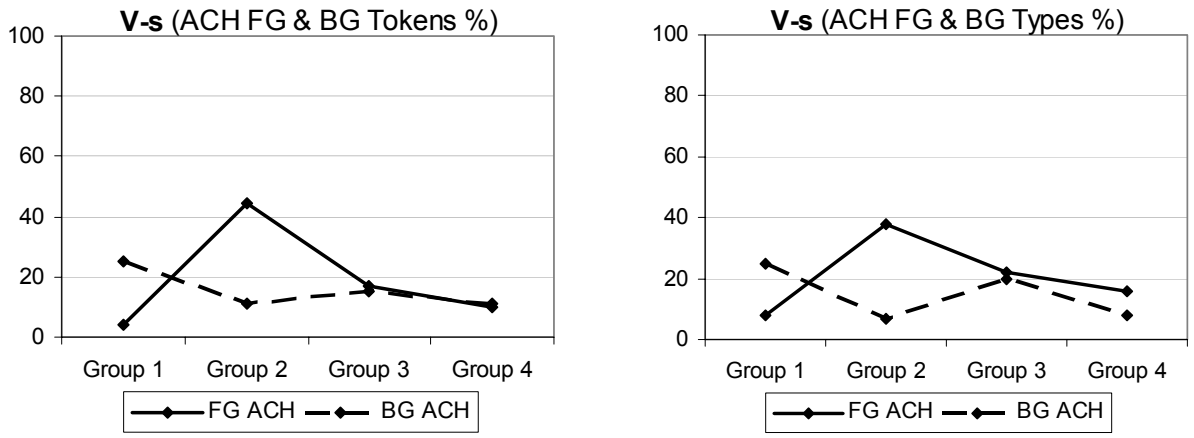
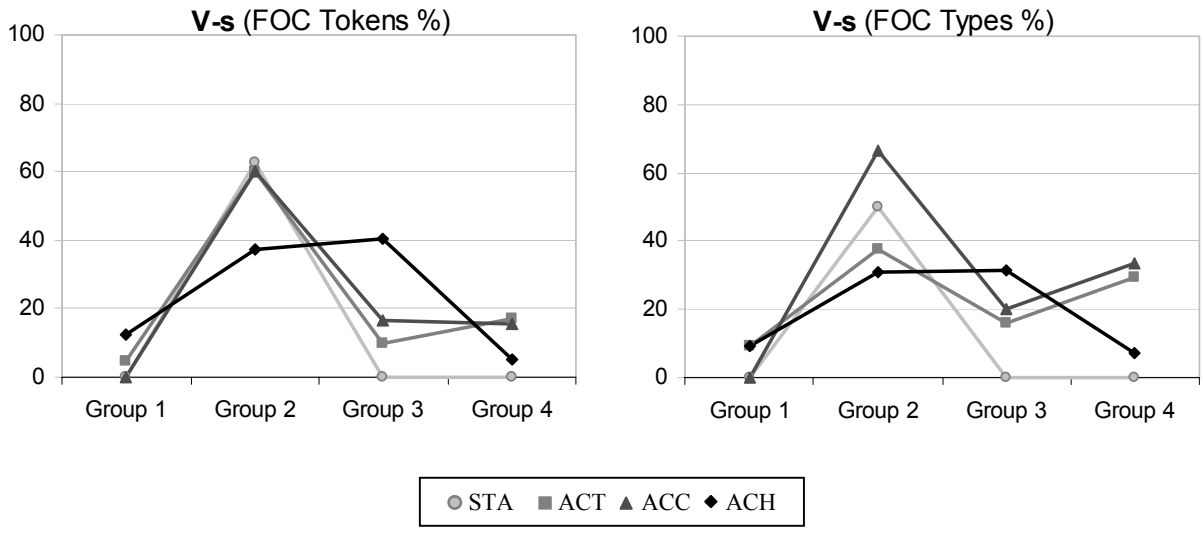


Figure 5.11: Development of Groups 1-4 V-s with lexical aspect in a) foreground (%), b) background (%), c) foreground vs. background (%).

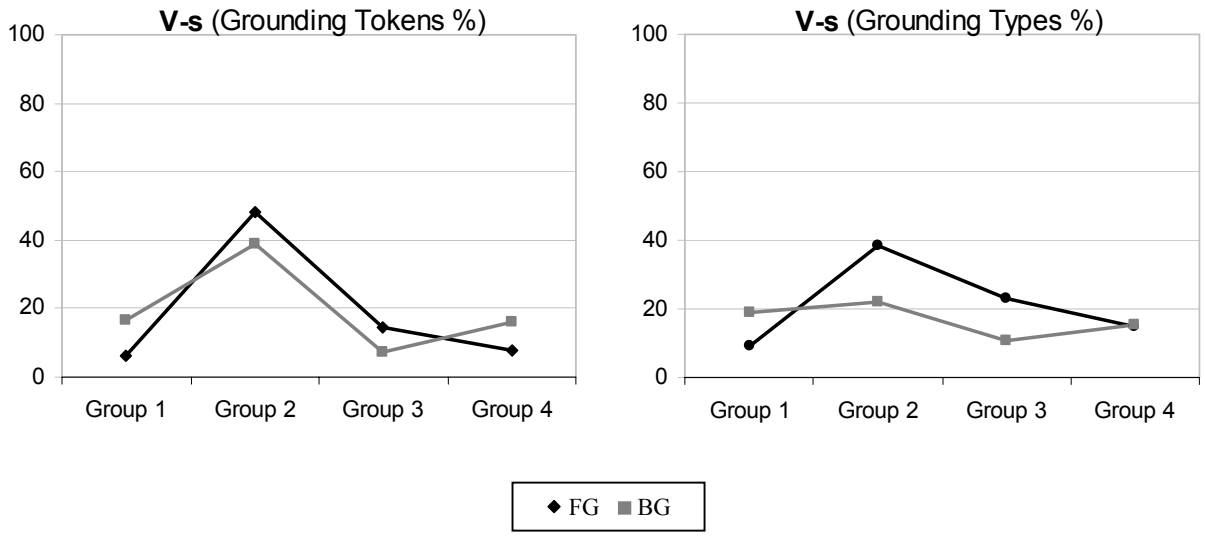
Here, STA are used to a significantly higher extent in the BG than in the FG throughout all four groups, whereas the reverse is true for ACH. The data for ACC and ACT remains inconclusive.



T-Test tokens: (p>.05)
T-Test types: (p>.05)

Figure 5.12: Development of Groups 1-4 V-s with lexical aspect in ¬focus (%).

Again, the FOC pattern rather resembles the FG than the BG, although it lacks the characteristic pattern of the STA, which are only present in Group 2.

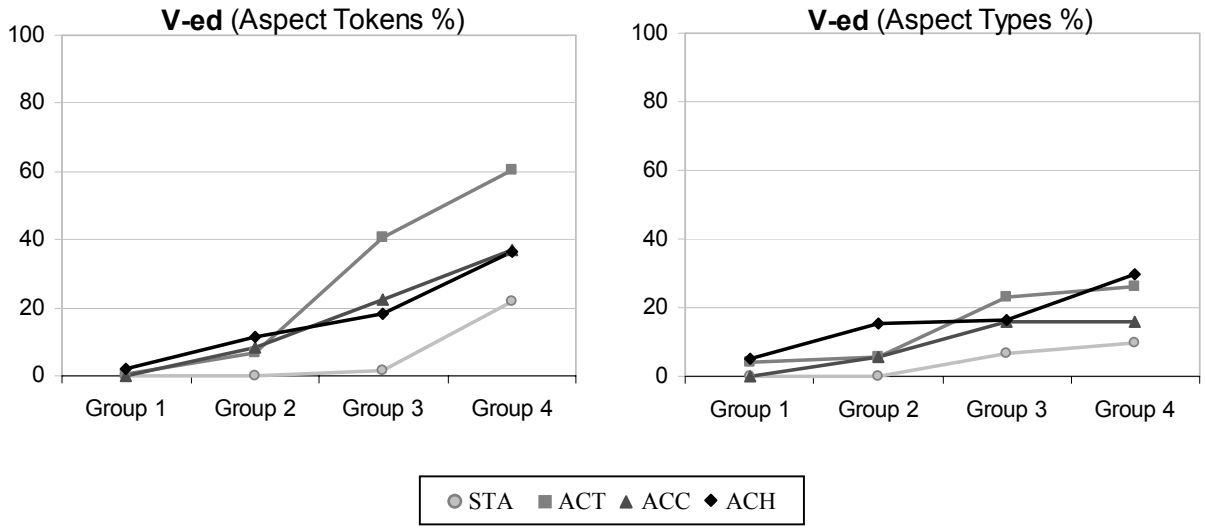


T-Test tokens: (p>.05)
T-Test types: (p>.05)

Figure 5.13: Development of Groups 1-4 V-s with grounding (%).

In spite of the grounding bias for STA in the background, the overall picture shows a very slight effect for V-s in the foreground in Groups 2 and 3, although this effect is far from being significant. This tendency seems to be stronger in the type count in the two intermediate grades (Groups 2 and 3) and is cancelled out in the most experienced Group 4. However, more data would be needed to corroborate this tendency.

5.1.4. V-ed



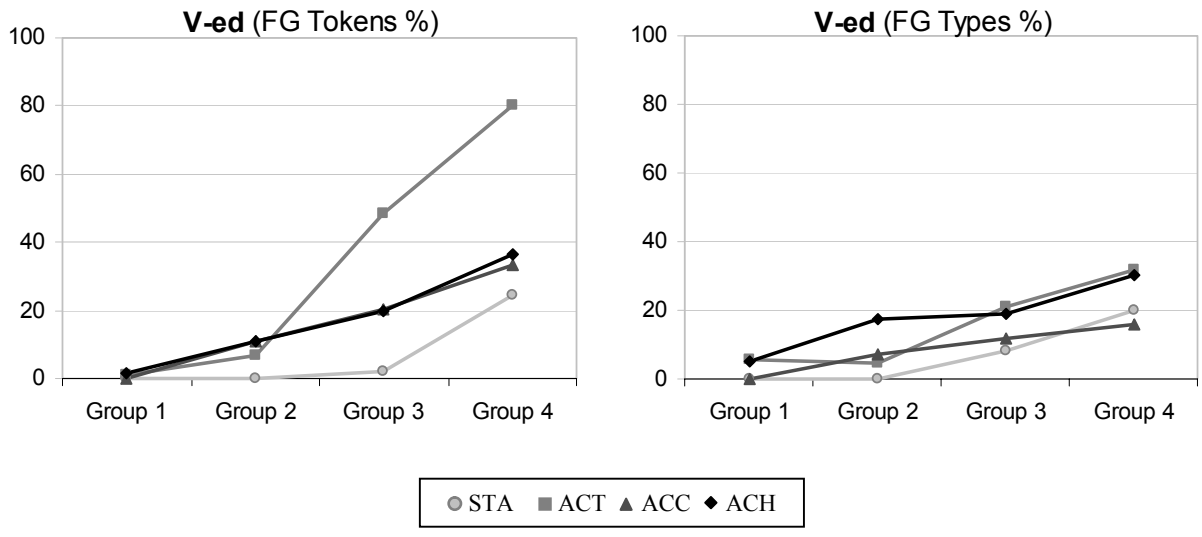
T-Test tokens: STA vs. ACT/ACC/ACH p<.05; ACT vs. ACC/ACH p<.05
T-Test types: STA vs. ACT/ACC/ACH p<.05

Figure 5.14: Development of Groups 1-4 V-ed with lexical aspect (%).

The use of V-ed (Figure 5.14) shows an interesting contrast between token and type analysis. The significantly infrequent and late use of STA with -ed is common to both, whereas the use of the other three categories with -ed starts in Group 2 and increases throughout the development within the sample. This is predicted by the aspect hypothesis for ACH and ACC. The significantly higher usage of ACT vs. ACC and ACH, however, as visible in the token analysis, is unexpected. Even the type analysis, which does not show a differential use between ACT, ACC and ACH, contradicts the AH. What would have been expected according to the hypothesis is a significantly higher use of ACH and ACC in contrast to ACT and STA. The token effect for ACT can be ascribed primarily to the repeated use of one verb type, the verb *look*, which is used 118 times out of 235 ACT tokens in Group 3 and 84 times out of 176 in Group 4.

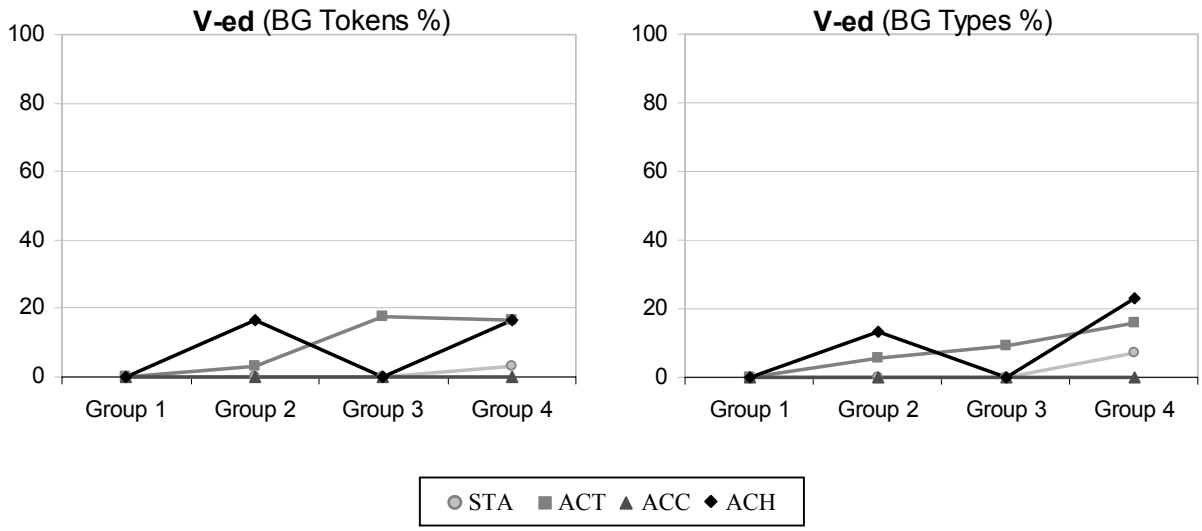
The next figure (Figure 5.15) shows that this significantly frequent use of ACT can be attributed to both the FG and the BG (a, b). However, the illustrations in c), which compare FG and BG for each category, show that this effect is stronger in the FG than in the BG. The same is true for ACH. Due to the lack of occurrences in the background, the data remains inconclusive for STA and ACC. But for STA, the results for V-ed are significantly lower in the FG as compared with the other three categories.

a)



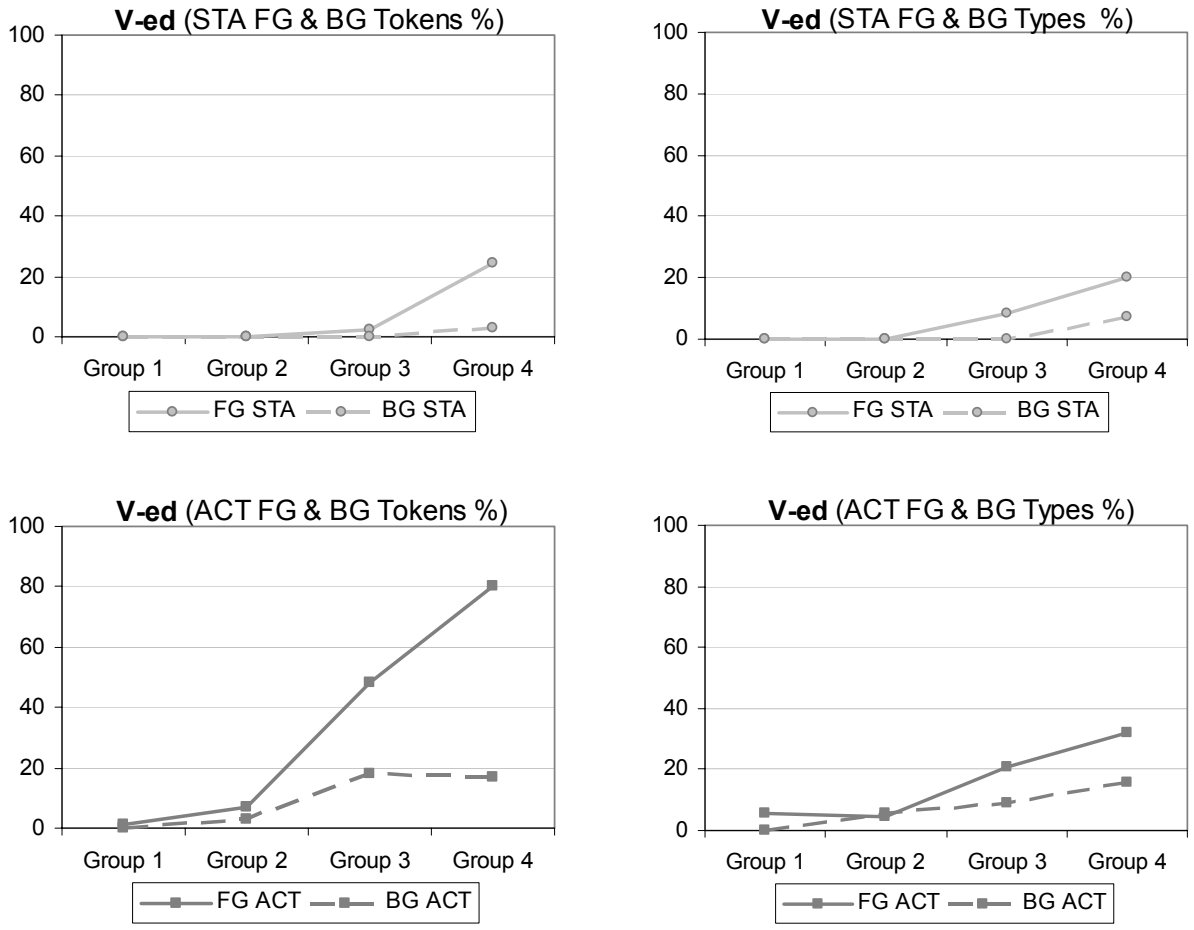
T-Test tokens: STA vs. ACT/ACC/ACH $p<.05$; ACT vs. ACC/ACH $p<.05$
T-Test types: STA vs. ACT/ACC/ACH $p<.05$; ACT vs. ACC/ACH $p<.05$

b)



T-Test tokens: ACT vs. STA/ACC $p<.05$
T-Test types: ACT vs. STA/ACC $p<.05$

c)



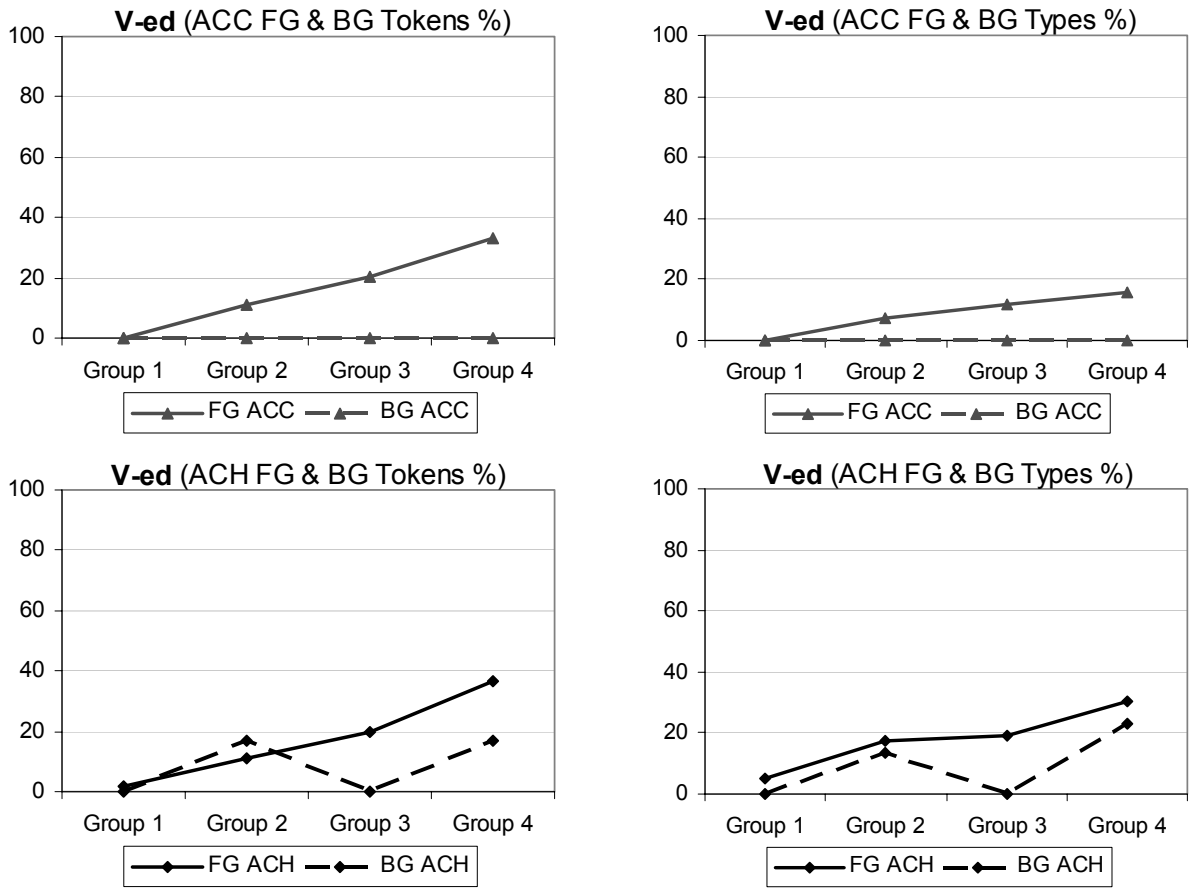
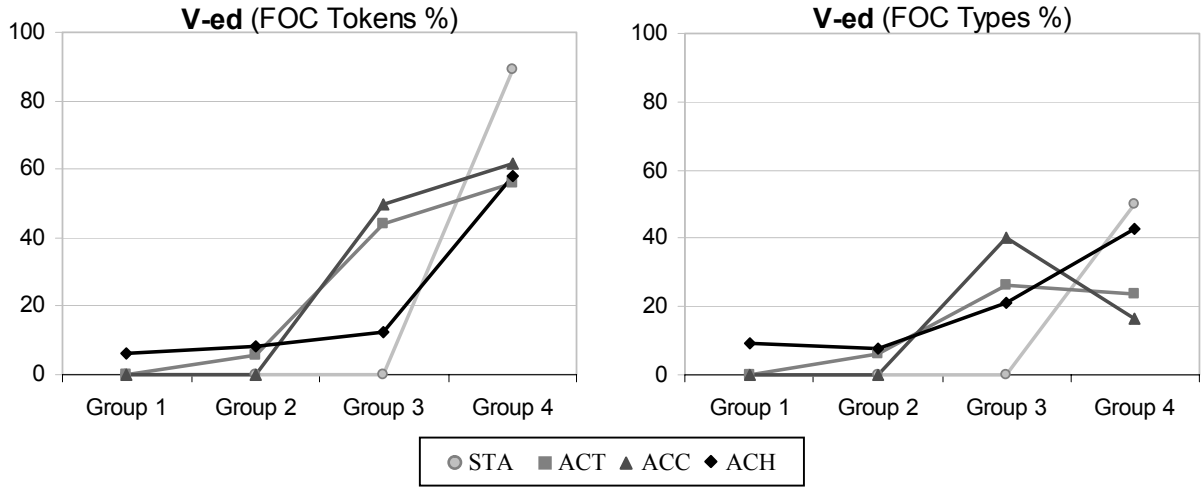


Figure 5.15: Development of Groups 1-4 V-ed with lexical aspect in a) foreground (%), b) background (%), c) foreground vs. background (%).

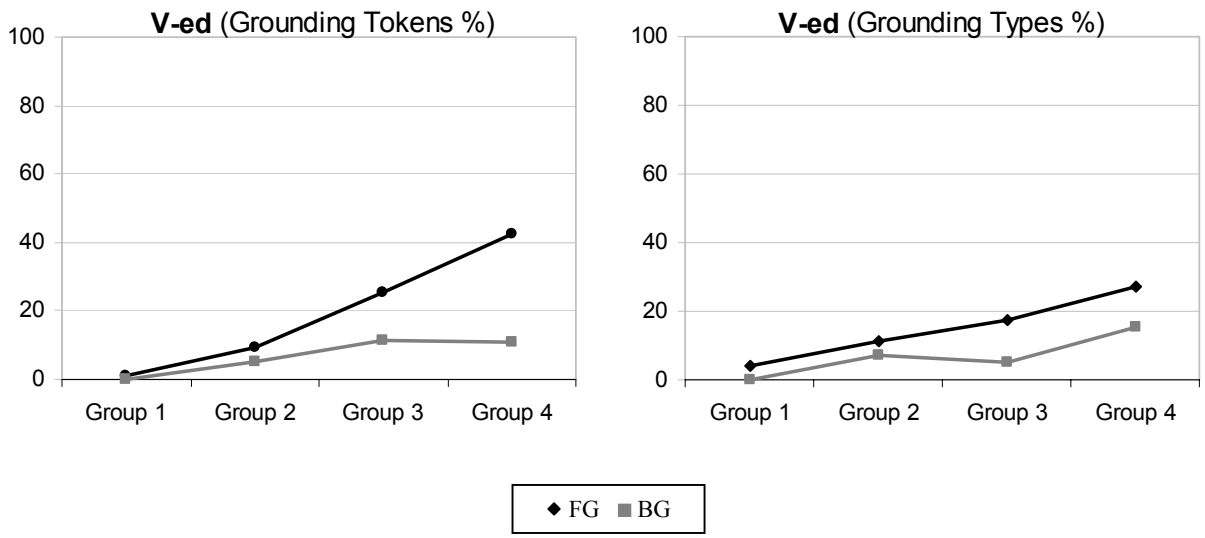
Again, the focus contexts (Figure 5.16) bear a stronger resemblance to the FG than to the BG, although ACC are used more frequently than in the FG.



T-Test tokens: ACT vs. STA/ACC/ACH $p<.05$
T-Test types: ACT vs. STA $p<.05$

Figure 5.16: Development of Groups 1-4 V-ed with lexical aspect in ¬focus (%).

Overall, the use of V-ed shows a strong grounding effect in favor of the foreground. As a matter of fact, V-ed is the only inflection with a significant grounding effect in the data. This finding is exactly in line with the predictions of the discourse hypothesis.

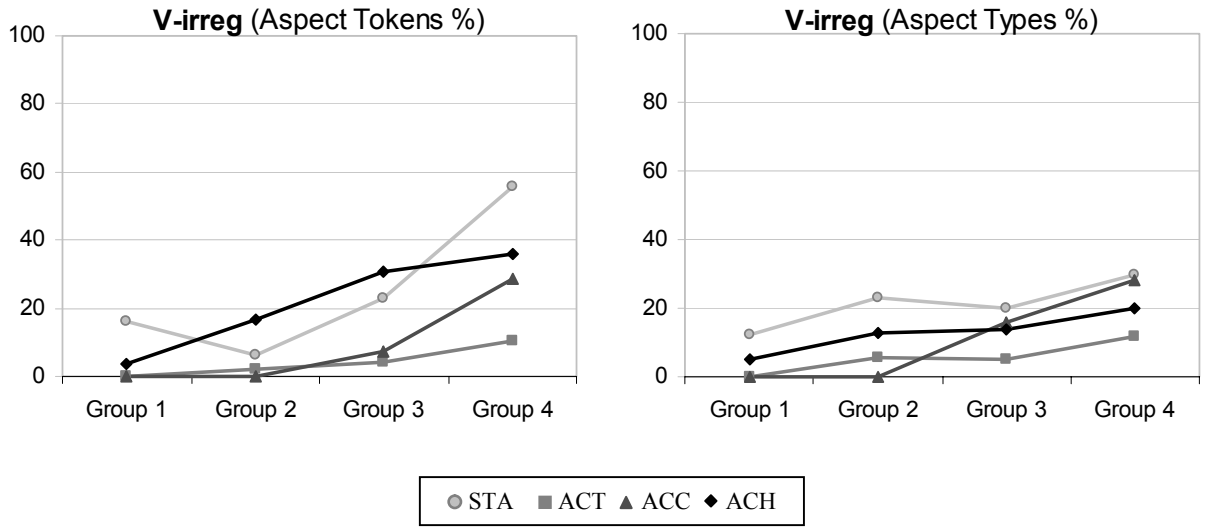


T-Test tokens: $p<.05$
T-Test types: $p<.05$

Figure 5.17: Development of Groups 1-4 V-ed with grounding (%).

In terms of development, the use of V-ed increases almost linearly over the four developmental groups, whereas the use of the non-past inflections V-ing, V-ø and V-s (Figure 5.5, Figure 5.9, and Figure 5.13) decreases with time of acquisition. This is probably an effect of the task and reflects the children's increasing temporal stability and their narrative competence. As some of the children in Group 4 still exhibit shifts in their tense of narration, it can be expected that later tests would show a further increase in the use of past inflections up to roughly 100% for the FG. To express it differently, the data shows that in Group 4 the children are still in a stage of their acquisitional process where they have not yet reached a steady state of narrative temporality.

5.1.5. V-irreg



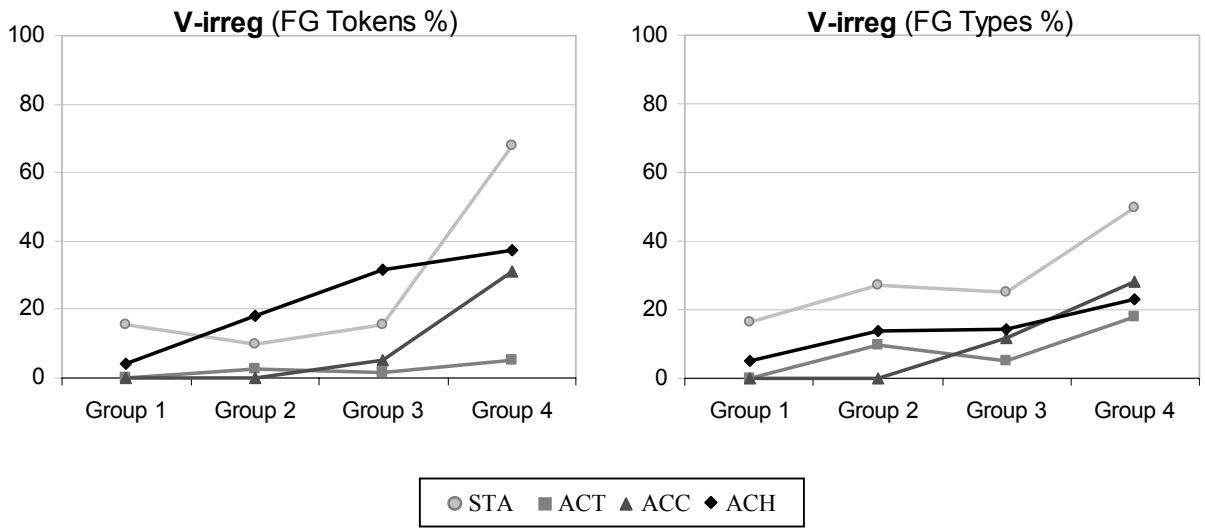
T-Test tokens: ACT vs. STA/ACH $p<.05$; STA vs. ACC $p<.05$, ACC vs. ACH $p<.05$
T-Test types: ACT vs. STA/ACH $p<.05$; STA vs. ACC $p<.05$

Figure 5.18: Development of Groups 1-4 V-irreg with lexical aspect (%).

The second past inflection, irregular past, is used in a distinctly different way from V-ed. The difference between ACT, STA and ACH is significant in both token and type counts. ACT are used least with V-irreg. STA and ACH, and later ACC (types) are used most frequently. These results show how important it is to distinguish between V-ed and V-irreg, as e.g. in Rohde (1996, 1997), and not consider them conjunctively in a merged category ("V-past"), as e.g. in Bardovi-Harlig (2000). Since both categories are inflected in a drastically different way, the aspectual effects would be diluted in a combined V-past category. However, V-irreg has a special status within the inflections, as the irregular conjugation has the only grammatically predetermined distribution (although one could argue as well about state verbs and -ing). It is also true that, grammatically, a rather high percentage of the STA lexemes used by the children are formed with irregular past, i.e. 53% vs. 27% regular past (cf. Table 5.1 below; the other STA lexemes are borrowings from the L1), and that the STA with irregular past are used in a higher frequency in the data than those with regular past (e.g. *have, hear, know, see, think that* vs. *love, smell, sound, want*). It has to be taken into account, though, that the focus of this study is not the grammatically accurate use of inflections, and that the inflectional distribution used by the children does not necessarily follow the grammatical distribution of the target language. Good examples are irregular verbs which are inflected regularly *(falled)* or creative forms such as irregular "base" forms inflected with other elements *(camed, feeling = fall)*. But admittedly the use of irregular past becomes increasingly target-like over the period of acquisition, and it can be assumed that it is increasingly guided by principles of grammaticality. Thus, the distribution of V-irreg remains a special case within the use of verbal morphology in the

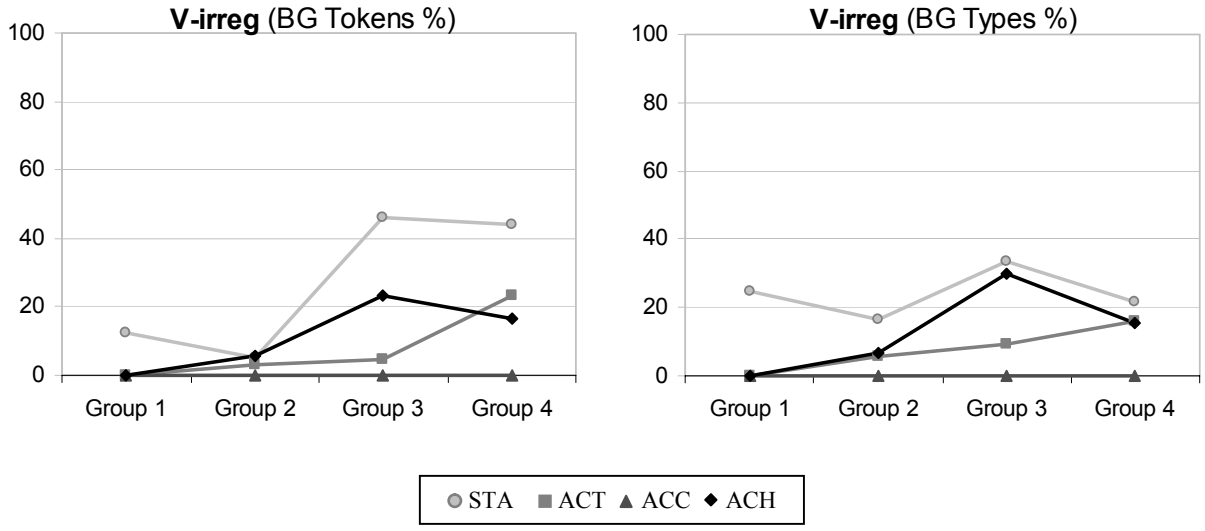
child narrations in that it is reflects the target distribution more strongly than other inflections.

a)



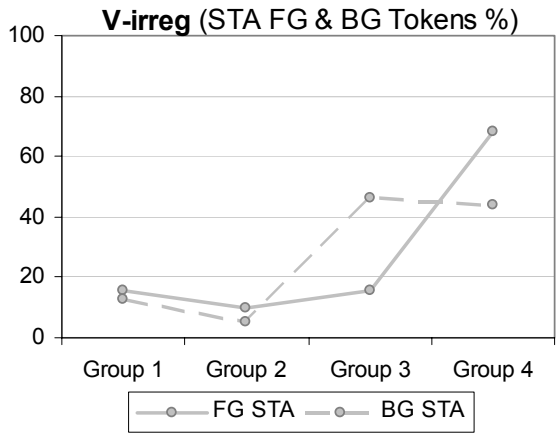
T-Test tokens: STA vs. ACT/ACC $p<.05$; ACH vs. ACT/ACC $p<.05$
T-Test types: STA vs. ACT/ACC $p<.05$; ACH vs. ACT/ACC $p<.05$

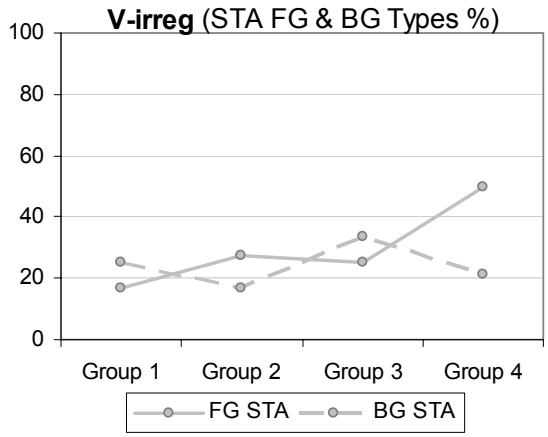
b)

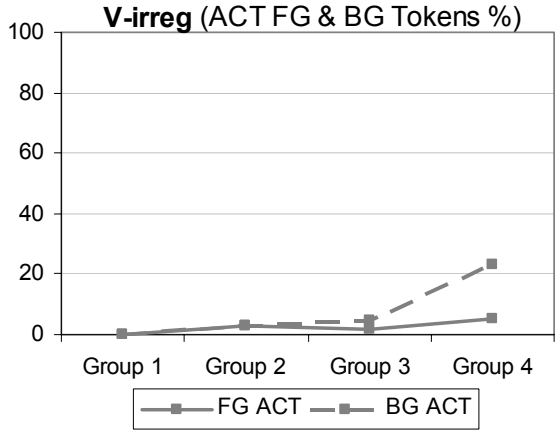


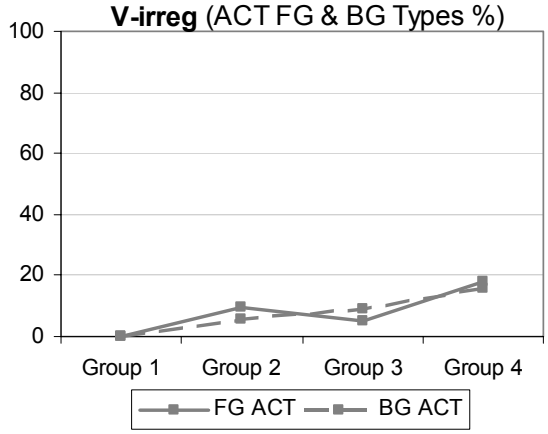
T-Test tokens: STA vs. ACC/ACH $p<.05$
T-Test types: STA vs. ACC/ACH $p<.05$

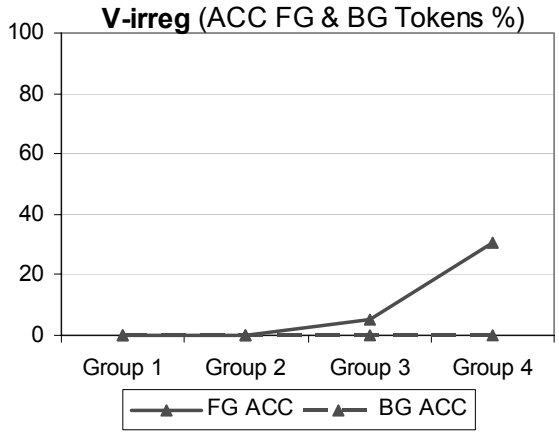
c)

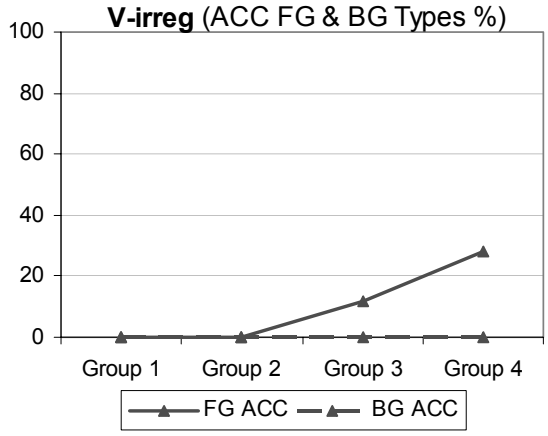

V-irreg (STA FG & BG Tokens %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG STA
BG STA


V-irreg (STA FG & BG Types %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG STA
BG STA


V-irreg (ACT FG & BG Tokens %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACT
BG ACT


V-irreg (ACT FG & BG Types %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACT
BG ACT


V-irreg (ACC FG & BG Tokens %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACC
BG ACC


V-irreg (ACC FG & BG Types %)
100
80
60
40
20
0
Group 1
Group 2
Group 3
Group 4
FG ACC
BG ACC

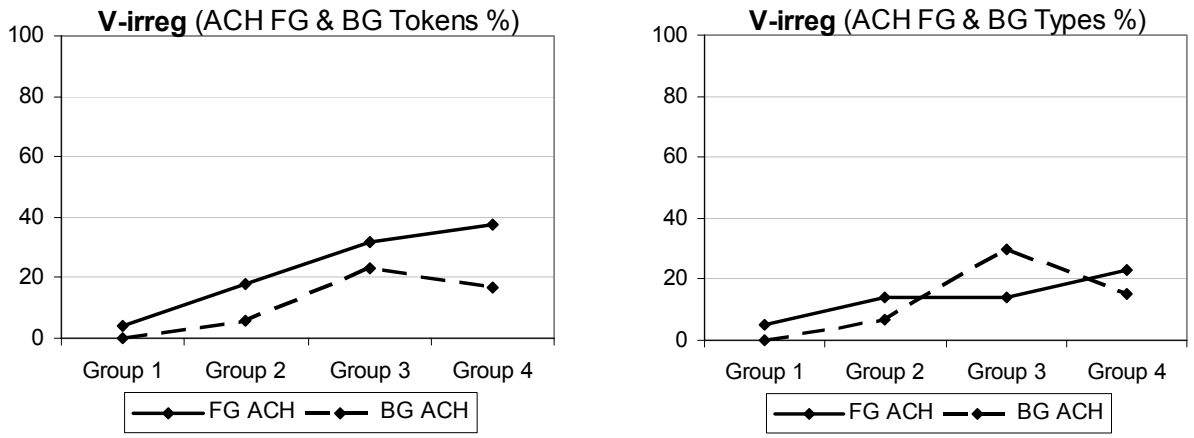
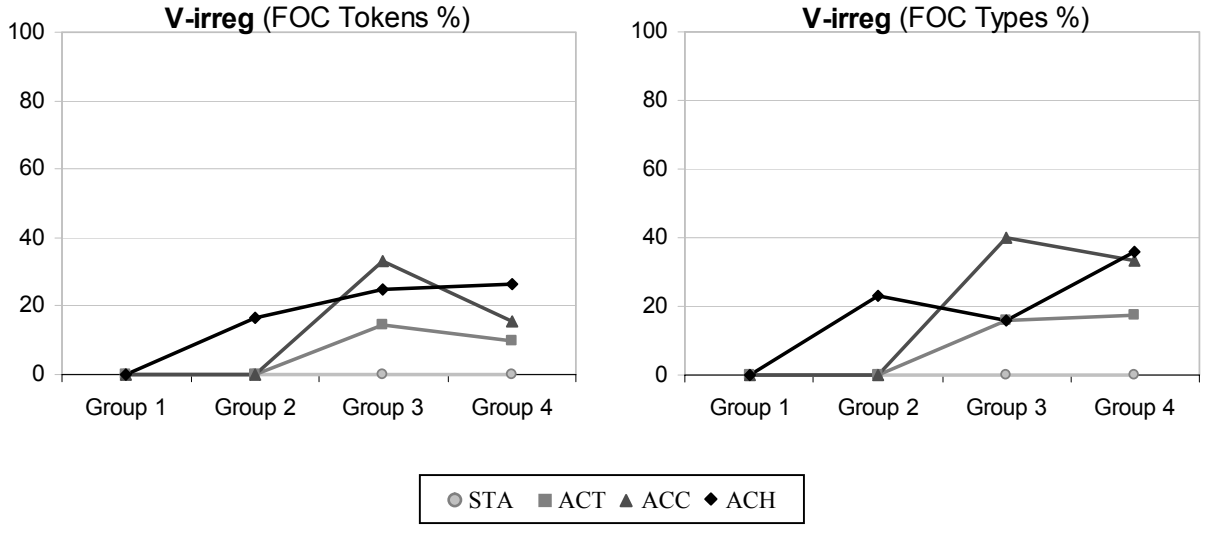


Figure 5.19: Development of Groups 1-4 V-irreg with lexical aspect in a) foreground (%), b) background (%), c) foreground vs. background (%)

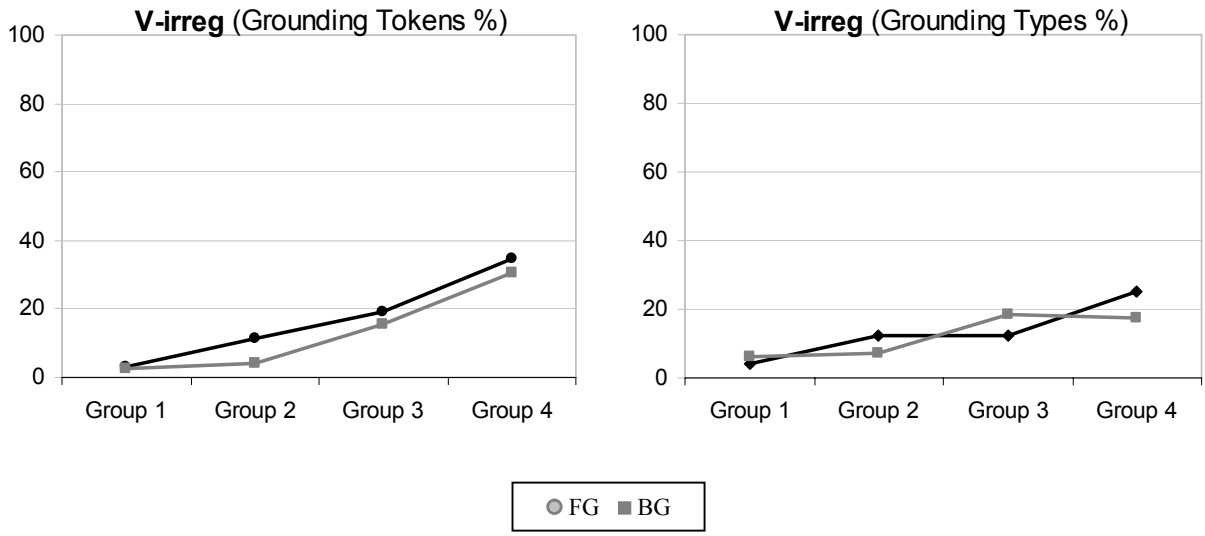
The dominance of STA vs. the other categories is significant both in the FG and in the BG. The high percentage of irregular verbs among the STA is probably the reason that STA are found most frequently in FG and in BG in comparison to the other categories (Figure 5.19 a-b). Figure 5.19 c) shows no clear grounding difference for FG or BG for all categories.



T-Test tokens: ACH vs. STA/ACT/ACC $p<.05$
T-Test types: ACH vs. STA/ACT/ACC $p<.05$

Figure 5.20: Development of Groups 1-4 V-irreg with lexical aspect in ¬focus (%).

In focus contexts (Figure 5.20), the use of V-irreg resembles the use in the FG for ACH the most and, in part, for ACC.



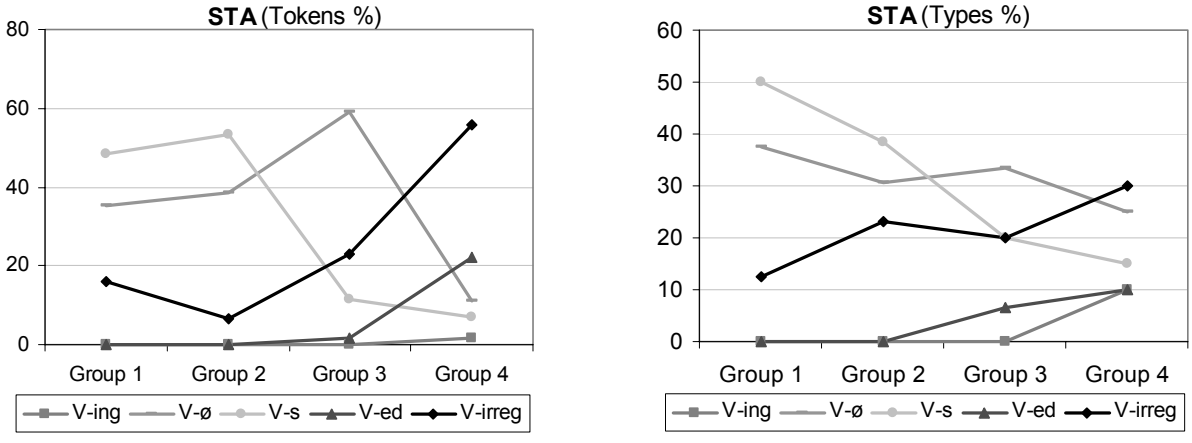
T-Test tokens: (p>.05)
T-Test types: (p>.05)

Figure 5.21: Development of Groups 1-4 V-irreg with grounding (%).

The overall grounding effect, however, remains inconclusive. Although there is a small difference in the use of tokens in the FG, this effect is not present in the type analysis, and it is by no means significant in either of the two counts (p=1.0 for both). This very strongly suggests that the Discourse Hypothesis should not in fact make predictions about V-past as a combined category of regular and irregular inflections. The observed significant grounding effect, which actually represents very strong evidence in favor of the DH, results exclusively from the use of V-ed. The data show clearly that the use of V-irreg remains absolutely irrelevant to the grounding predictions.

5.2. Summary of the findings

5.2.1. General development of inflections



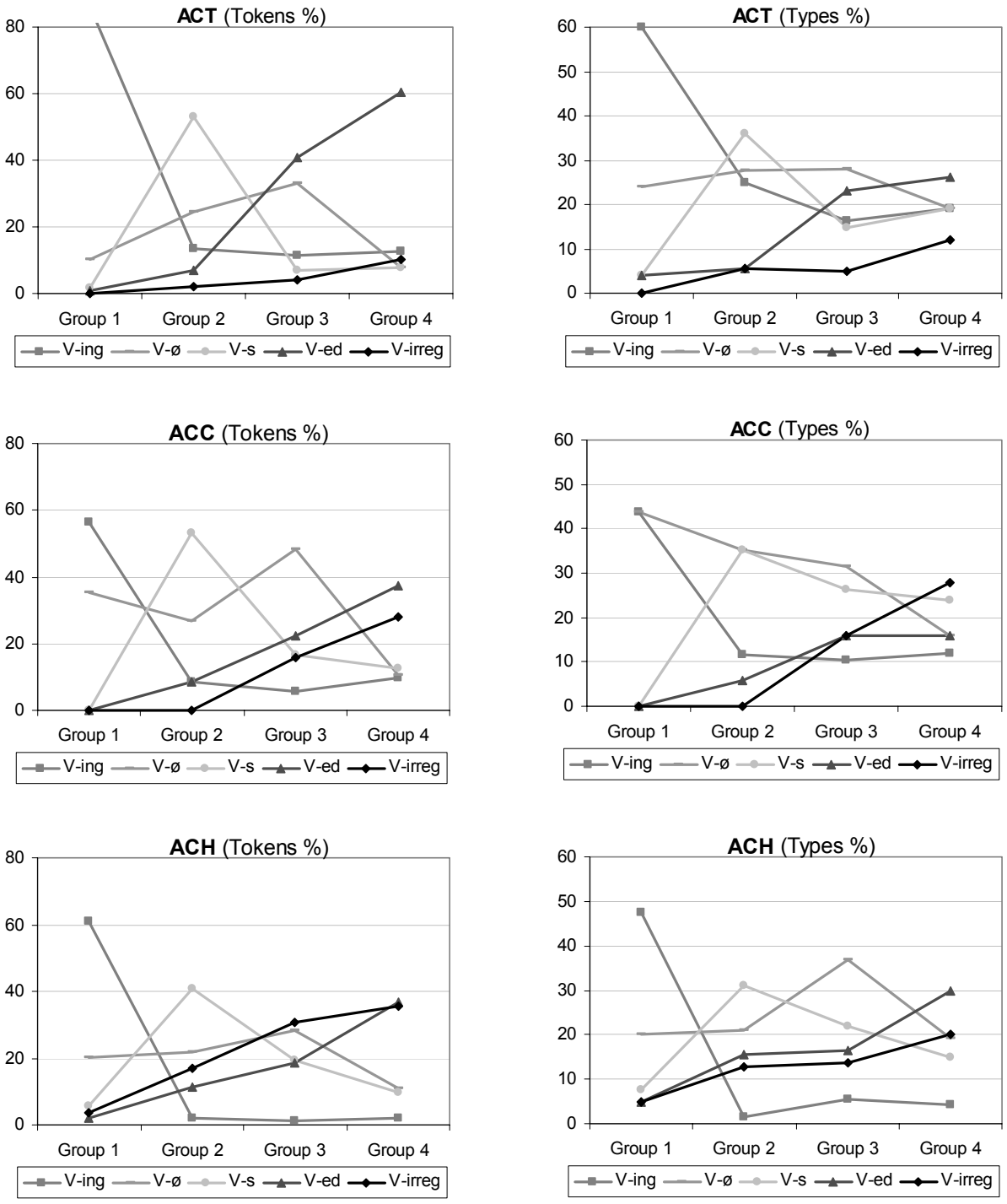


Figure 5.22: Distribution of verbal inflections according to each category of lexical aspect over time.

Figure 5.22 summarizes the general development of verbal inflections in all categories. It is striking that, with the exception of STA, the development is similar in all categories: a high amount of V-ing in Group 1 is replaced by V-ø/V-s in Groups 2 and 3 (ACC start earlier with V-ø as well), which are finally replaced by an increasingly strong amount of V-past in Groups 3 and 4. STA miss out on the high frequency of V-

ing in the beginning and start with V-s (V-ø) right away. As explained above, this development illustrates the overall *frequency of use* for each single inflection rather than pure percentages of the categories (section 4.5.4.1 on the difference between the within- and the across-category analysis). The general development of verbal morphology in the narrations is thus

V-ing (¬STA) ⇨ V-s/V-ø ⇨ V-past

for all inflections. Note, however, that this finding does not reflect the actual order of *emergence* of a morphological structure (e.g. Pienemann 1998) which rather predicts the order V-ing ⇨ V-past ⇨ V-s. It has to be kept in mind that the *emergence* of a structure in the sense of its neural processability is not necessarily related to its *predominant use in a narrative context*. This study only makes claims about the latter.

Category	Reg. Past (#)	Irreg. Past (#)	Reg. Past (%)	Irreg. Past (%)
STA	4	8	27	53
ACT	27	15	57	32
ACC	7	12	33	57
ACH	34	32	48	45

Table 5.1: Distribution of target-language regular and irregular past lexemes in the data

To tease apart the category of V-past above, Table 5.1 shows the general distribution of the grammatically target-like past inflections of the verb types used by the children. The two columns indicating the percentages show that regular and irregular conjugations are distributed rather unevenly over the four lexical categories. If the data were in accordance with this distribution, it should be expected that STA are generally infrequent with V-ed (only 27% of all STA verbs are regular) and frequent with V-irreg (53% of all STA are irregular)

The development of V-ed and V-irreg shows that these expectations are all confirmed in Groups 3 and 4 except for the ACC (tokens). In the case of ACC, this is probably due to the fact that in Group 3 only three regular and irregular verb types were inflected with past, respectively, and that only one regular verb, the verb *climb*, was used to a much higher proportion than all other types. A stronger lexical variability of ACC is only found in Group 4, where the types reflect the predicted distribution. Assumably, this distribution would increase in later tests. The next paragraph summarizes the general distribution of inflection within the four categories.

STA: V-s/V-ø ⇨ V-irreg ⇨ V-ed

ACT: V-ing ⇨ V-s/V-ø ⇨ V-ed ⇨ V-irreg

ACC: V-ing/V-ø ⇨ V-s ⇨ V-ed ⇨ V-irreg

ACT: V-ing ⇨ V-s/V-ø ⇨ V-ed/V-irreg

Nevertheless, the pattern observable in the FOC contexts, i.e. the contexts with simultaneous actions to FG events, which do not exactly correspond to the definition of a

sequential forward movement on the story's time line, shows much more resemblance to the FG than to the BG. This result, even if not surprising, shows that the criterion of *sequentiality* should not be applied exclusively as the only relevant criterion for FG. To include contexts such as the FOC contexts identified in this study, these data show that the criteria of *inceptiveness* and *telicity* capture FG events much more precisely than the application of *sequentiality* as a single criterion.

5.2.2. Aspect hypothesis

The AH was confirmed for all predicted components. Additionally, several other aspectual interrelations were found in the data. However, not all effects were evident at the same time interval in the learning process.

A strong early effect is the predominance of ACT with V-ing. This effect remains visible throughout the whole sample (Groups 1-4). Another early effect can be observed with STA and V-s (Group 1). The next discernible aspectual effect is the use of ACH with both past inflections V-ed and V-irreg (Groups 2-4), and finally the latest effect is apparent in the use of ACC with both past inflections (Groups 3-4). In the case of both past inflections, the distribution of regular vs. irregular past is related grammatically to the target language. As past tense seems to have become the target narration tense of the children by the end of grade 4, aspectual and grammatical marking seem to converge with time of learning.

Additional effects, which are not predicted by the AH but which are revealed in the data set, are the prevalent use of V-ing with ACT, ACC and ACH in the earliest stage, the connection between STA and the base form V-ø in intermediate stages, the intermediate and late effect for ACT with V-ed, which is especially pronounced in the token analysis, and finally the strong connection between STA and V-irreg throughout the whole process (Groups 1-4). The development of aspectual marking in the child data can thus be summarized as follows (Table 5.2). This summary indicates several interpretations: Firstly, the development of verbal inflections differs with each lexical category. There seem to be time windows for each inflection which appear at different times according to the respective category.

Group	1	2	3	4
STA	**V-s/V-ø/V-irreg**	**V-s/V-ø/V-irreg**	**V-irreg**	**V-irreg**
ACT	**V-ing**	**V-ing**/V-s	**V-ing/V-ed**	**V-ing/V-ed**
ACC	V-ing/**V-ø**	V-ing/**V-ø**/V-s	V-ing/V-s/**V-ed/irreg**	V-ing/V-s/**V-ed/irreg**
ACH	V-ing	**V-ed/irreg**	V-s/**V-ed/irreg**	**V-ed/irreg**

t

Table 5.2: Summary development of verbal inflections with lexical aspect (bold: strong effects, normal print: weak effects)

Secondly, categories which share specific features of duration or telicity are inflected in a similar manner. This is true for ACT and ACC, which share the feature *durative*, and which are the only categories with an effect for V-ing throughout the whole acquisition time, and for ACC and ACH, which share the feature *telic*; they share the use of both past-inflections in later development. And thirdly, ACC as the intermediate category with features from both ACT and ACH show the most diverse use of verbal inflections, a tendency which seems to reflect some uncertainty of the learners as to the categorization.

5.2.3. Discourse hypothesis

The data set also provides evidence in favor of the predictions of the discourse hypothesis. The observable effect of V-ing in the BG in intermediate stages (Groups 2-3) is far from being significant. In Group 1, this effect is overridden by the predominant use of V-ing throughout all contexts, and in Group 4 it seems to give way to a more grammatically target-like use of the gerund. Clearer tendencies in discourse grounding can be observed for V-ø and V-s in the intermediate groups (Groups 2-3) in the FG, which afterwards decreases in Group 4 for the benefit of V-ed. Indeed, the effect of V-ed is the strongest and the only significant grounding effect in the data. It shows an almost linear increase over all four groups, especially the type analysis, so that it can be assumed that V-ed will be used by the learners as the most stable indicator of discourse grounding in later stages of language acquisition as well. Contrary to the predictions of Bardovi-Harlig (2000 a.o.), however, the data for V-irreg remains insignificant and shows, if anything, that the strong discourse effect of V-ed should not be overextended to and diluted by a combined category of V-past which does not differentiate between the two past inflections. The data of this study present strong evidence for the assumption that the grounding effects of V-past observed in earlier studies are solely a result of the differential use of V-ed. Table 5.3 shows the development of discourse marking over the four groups:

Group:	1	2	3	4
FG	(V-ing)	V-ø/V-s	V-ø/V-s/V-ed	V-ed
BG	V-s	V-ing	V-ing	–

t

Table 5.3: Summary development of verbal inflections with grounding.

5.2.4. Aspect and discourse combined

The interesting question remains as to how both effects interact with each other, i.e. whether the lexical categories are inflected differently in different grounding contexts.

The data reveal that the effects do indeed vary with respect to different combinations of lexical aspect and grounding. Nevertheless, the findings of Bardovi-Harlig could not entirely be replicated.

The fine-grained analysis of lexical aspect in the different grounding categories shows which lexical categories cause the observed tendencies and effects in discourse grounding. The grounding tendency of V-ing in the BG is mainly due to ACT (Groups 2-3). The effect of V-ø is based on STA (tokens) and ACH (Groups 2-3). The strong grounding effect of V-s in the BG can be ascribed to the STA (Groups 1-4, types 2 and 4) and only weakly to ACH (in Group 2), and finally, the strong effect for V-ed in the FG must be attributed to ACT and ACH. There is no conclusive data about ACC as the instances of ACC in the BG are limited to four tokens / two types in the complete set.

The statistical analysis reveals a significant bias for ACT with V-ing in the FG and the BG over all four developmental groups, one for V-ø with STA in the FG in intermediate stages and for V-ø with ACT in the BG. Furthermore, V-s is used significantly most frequently with STA in the BG at all stages. The same is true for V-irreg with STA in the FG and the BG. Finally, in the later stages of development (Groups 3 and 4) V-ed is predominantly used with ACT, ACC, and ACH in the FG; in the BG, V-ed is restricted to ACT.

Again, the developmental order in the data reveals that each aspectual category changes its sensitivity for discourse contexts over time. The summary of this development, which is based on the comparison of use in the FG and the BG as presented in the third part (c) of the illustrations of lexical aspect in grounding above, can be expressed as follows (Table 5.4):

Group:	1	2	3	4
STA	(V-s)	V-s / (V-ø)	(V-s) / (V-ø)	V-s
ACT	V-ing	V-ing	V-ing / V-ed	(V-ing) / V-ed
ACC	–	–	–	–
ACH	V-ing	V-s / V-ø	V-ø / V-ed	V-ed

t

Table 5.4: Summary grounding sensitivity of lexical aspect with verbal inflections.

This development is summarized in the diagrams below (Table 5.5 - Table 5.8 and Figure 5.23 - Figure 5.27), where the results across the whole data set are shown (display according to Bardovi-Harlig 2000).

Form	STA		ACT		ACC		ACH		Verbs
FG Tokens	%	(n)	%	(n)	%	(n)	%	(n)	(n)
V-ing	0	0	22	84	15	35	10	84	**203**
V-ø	36	58	21	81	31	74	22	190	**403**
V-s	16	25	15	56	21	49	19	167	**297**
V-ed	11	18	39	147	20	48	21	185	**398**
V-irreg	37	60	2	9	12	29	27	237	**335**
perfect	0	0	0	0	0	0	0	3	**3**
Total	**100**	**161**	**100**	**377**	**100**	**235**	**100**	**866**	**1639**

Table 5.5: Tokens Group 1-4 – Distribution of verb morphology within FG

Form	STA		ACT		ACC		ACH		Verbs
FG Types	%	(n)	%	(n)	%	(n)	%	(n)	(n)
V-ing	0	0	26	16	16	6	15	19	**41**
V-ø	27	4	26	16	32	12	22	28	**60**
V-s	27	4	21	13	24	9	24	31	**57**
V-ed	13	2	18	11	11	4	22	29	**46**
V-irreg	33	5	8	5	18	7	16	20	**37**
perfect	0	0	0	0	0	0	2	2	**2**
Total	**100**	**9**	**100**	**35**	**100**	**19**	**100**	**63**	**126**

Table 5.6: Types Group 1-4 – Distribution of verb morphology within FG

Form	STA		ACT		ACC		ACH		Verbs
BG Tokens	%	(n)	%	(n)	%	(n)	%	(n)	(n)
V-ing	1	1	43	55	0	0	7	3	**59**
V-ø	23	16	23	30	50	2	5	2	**50**
V-s	41	29	13	17	0	0	16	7	**53**
V-ed	1	1	11	14	0	0	14	6	**21**
V-irreg	32	23	8	10	0	0	16	7	**40**
perfect	1	1	2	2	50	2	42	18	**23**
Total	**100**	**71**	**100**	**128**	**100**	**4**	**100**	**43**	**246**

Table 5.7: Tokens Group 1-4 – Distribution of verb morphology within BG

Form	STA		ACT		ACC		ACH		Verbs
BG Types	%	(n)	%	(n)	%	(n)	%	(n)	(n)
V-ing	6	1	26	9	0	0	8	2	**12**
V-ø	25	4	20	7	33	1	4	1	**13**
V-s	31	5	26	9	0	0	13	3	**17**
V-ed	6	1	11	4	0	0	17	4	**9**
V-irreg	25	4	11	4	0	0	17	4	**12**
perfect	6	1	6	2	67	2	42	10	**15**
Total	**100**	**10**	**100**	**17**	**100**	**2**	**100**	**17**	**46**

Table 5.8: Types Group 1-4 – Distribution of verb morphology within BG

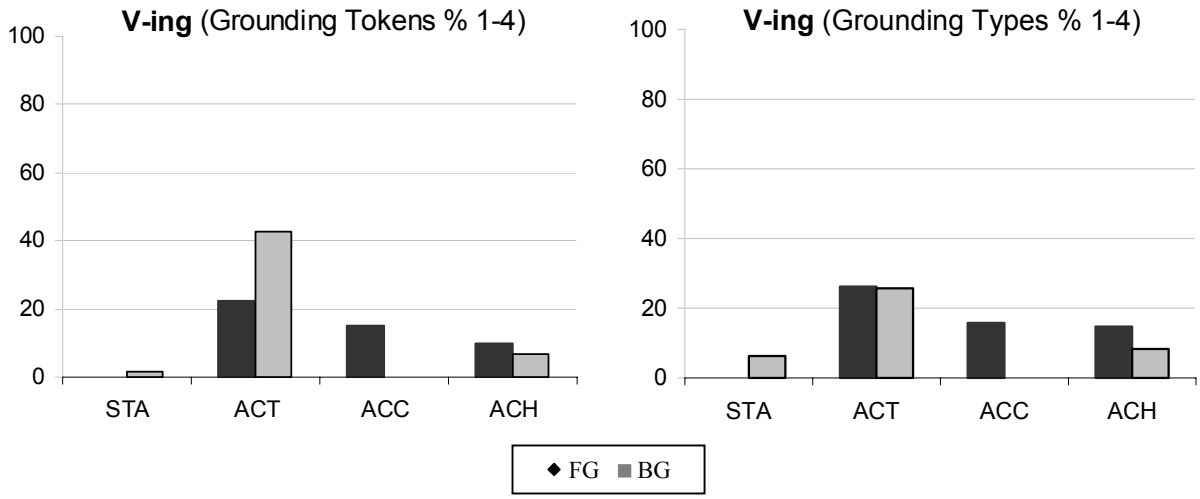


Figure 5.23: Groups 1-4 – Grounding effect V-ing (FG vs. BG)

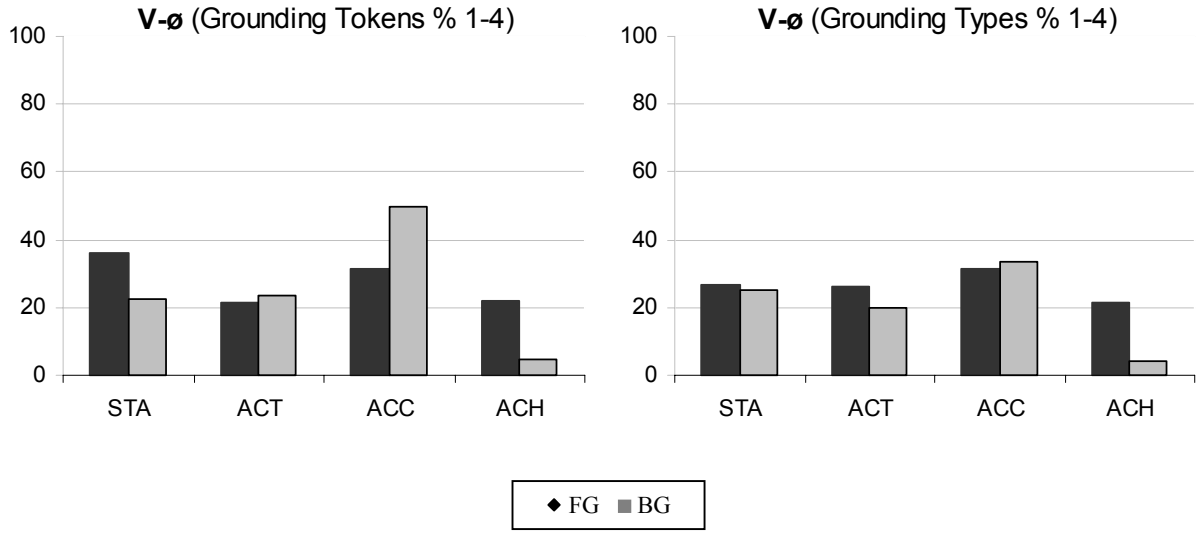


Figure 5.24: Groups 1-4 – Grounding effect V-ø (FG vs. BG)

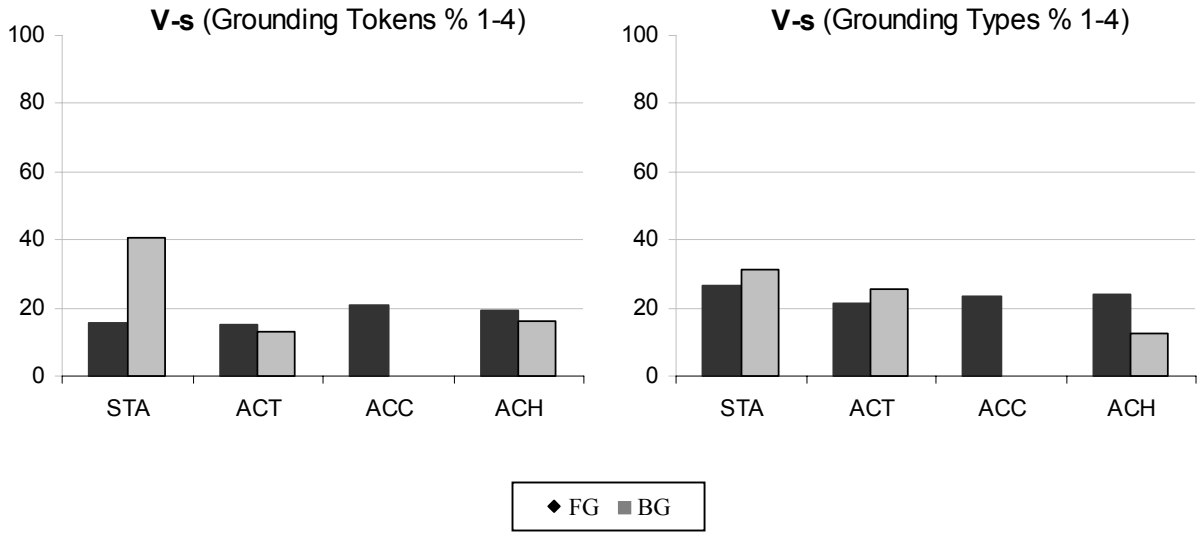


Figure 5.25: Groups 1-4 – Grounding effect V-s (FG vs. BG)

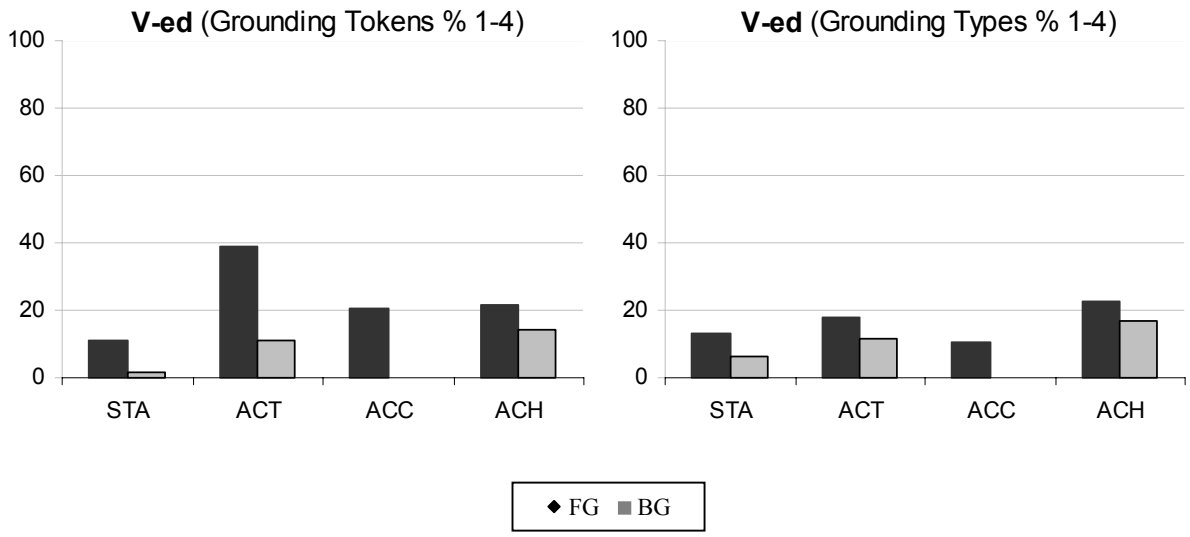


Figure 5.26: Groups 1-4 – Grounding effect V-ed (FG vs. BG)

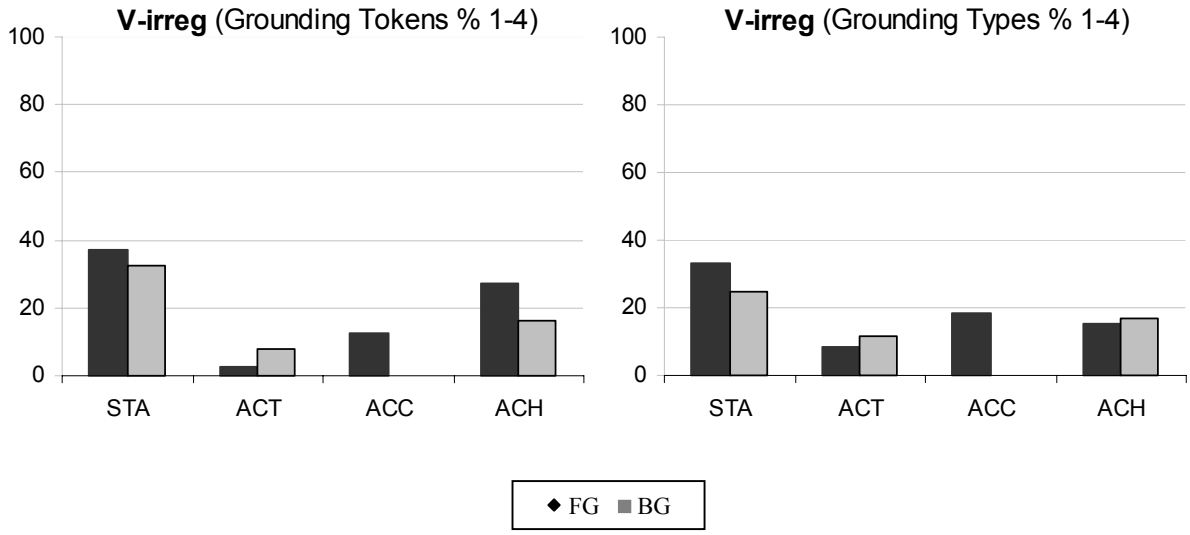


Figure 5.27: Groups 1-4 – Grounding effect V-irreg (FG vs. BG)

The discourse sensitivity becomes visible at one glance where the black columns of the FG and the grey columns of the BG differ in height. For example, in these diagrams, ACT tokens show a reverse effect for V-ing (BG) and V-ed (FG). STA, which were not part of Bardovi-Harlig's (2000) analysis, show a reverse effect for V-ø and V-s (again more pronounced in the token diagrams). The grounding sensitivity revealed in this set of data is higher and more varied than in the results of Bardovi-Harlig. In her analysis, ACT have been found to be most sensitive, and ACH least sensitive to discourse grounding. Here it could be shown, however (Table 5.4), that the children use all lexical categories with different inflections at different periods of their learning process to distinguish foreground from background information in their stories. It is striking, in this distribution, that STA and ACT show the highest grounding sensitivity to the inflections they are attributed to by the aspect hypothesis. What becomes apparent, however, in the case of ACH, is the changing quality of discourse marking which

the children use from one developmental stage to the next. This effect is diluted in presentations such as the diagrams below, which calculate the grounding effect across the whole data set. They only become visible in the developmental presentation as part c) of each figure above.

The overview diagrams reveal yet another interesting aspect with regard to ACH. While in the token analysis there is a slight (V-ing, V-s, V-ed) to pronounced (V-ø, V-irreg) bias for the FG, the type analysis reinforced the bias also for V-s, but it reverses the effect for V-irreg. This difference once more elucidates the importance of not taking tokens into account exclusively. The overall low scores in the BG can be explained by the fact that these diagrams do not include the perfect, which is responsible for 42 % (# 10) of ACH types in the BG, vs. 2 % (# 2) of ACH types in the FG. The perfect occurred only very rarely in the whole data set (28 tokens, 17 types) and therefore, was not intensively discussed. However, the few occurrences show a very strong distributional bias. It can therefore be expected that this effect will be reinforced once the perfect has emerged more solidly in the child language. Since the perfect describes an event which is outside the chronological time line of a narrative and is therefore a prototypical example for the BG, this bias indicates a development toward the grammatical target of English.

6. Conclusion

Based on the assumption that verbal inflections are distributed according to aspect and discourse principles in learner language, this study set out to examine the L2 production of young learners of English from their beginning stages of language acquisition to an advanced level. For this purpose, a longitudinal study was set up with the first cohort of an immersion elementary school in Kiel-Altenholz, Germany. With the help of a complex picture story, the so-called *Frog Story*, 70 L2 narratives were elicited from 18 children in that group. The tests resulted in a set of data in which the distribution of verbal inflections was analyzed according to categories of lexical aspect and discourse.

As a recapitulation of the various analytical procedures carried out in this study, it can be stated that lexical aspect and discourse grounding are indeed intertwined in the emergence of verbal morphology in learner language. Overall, the Aspect Hypothesis could be confirmed in the narratives of young L2 learners of English, but the data showed that different time windows become relevant for the emergence and the distribution of different structures. The data thus clearly supported the assumption that aspectual effects cannot be explained without recourse to discourse context. As will be explained below, they might be reinforced or diluted by the context. However, lexical aspect seems such a dominant distributional principle in early stages of learner language that in the future, it should be taken into account for each research frame which investigates L2 verb morphology.

Similarly, the Discourse Hypothesis was clearly confirmed for V-ed in the FG and for V-ing in the BG. The separation of the two past inflections V-ed vs. V-irreg distinguishes this study from previous studies, especially in the area of the Discourse Hypothesis (a few earlier studies, such as Rohde 1996, used this approach and were used as an example for this analysis). This separation proved to be an important methodological tool, as it shows that in fact only V-ed is responsible for the discourse effect.

In the very early stages of L2 acquisition, V-ing is used predominantly as a default verb marker in most of the stories. This is true for both the FG and the BG. In the following developmental stage, the children show the tendency to use V-ø and V-s as discourse markers, until finally V-ed predominates in all advanced stories to distinguish the FG from the BG.

Interestingly, all aspectual categories (STA, ACT, ACC, and ACH) show a certain sensitivity for grounding. Here, as with the aspectual bias, this sensitivity is restricted to different inflections at different times. Throughout the data, it is striking that the lexical categories are especially sensitive to grounding effects with the inflections for which they also show an aspectual effect over time, as for example STA with V-s and ACT with V-ing and V-ed.

I suggest the following explanation for the categories which attract non-past inflections, i.e. STA and ACT: After overcoming the default phase, the influence of

lexical aspect prevails for some time independently of grounding. This is the time window in which V-s and V-ing are used predominantly with STA and ACT. Then, the discourse effect kicks in, and the FG becomes increasingly inflected with V-past, mirroring the narrative rules of storytelling in the target language (as well as in the L1). During this time, the aspectual bias for V-s and V-ing becomes and remains manifest in the BG until the discourse effect, and with it the grammatical rules of the target language, are transferred to the BG as well. Figure 5.3 c) and Figure 5.11 c) bear strong evidence for this explanation. The BG is the weaker narrative environment in the sense that it is much less frequent, less salient, and much more varied in the grammatical structures it contains. It is therefore only logical that it takes the children longer to fully comprehend the concept of the BG in a narrative.

The bias for ACT, ACC and ACH for V-ed in the FG is more easily explained, since both effects reinforce each other. (Unlike previous studies, ACT revealed an aspectual effect comparable to that of the two telic categories in this data set.) As expected, the use of V-ed in the BG was found only in the more advanced narratives.

This reasoning corroborates Bardovi-Harlig's ideas, in which she describes grounding as a "universal pressure" (2000:315f), assuming that it leads the learner beyond lexical aspectual marking to discourse marking and thus opens the way for the expansion and diversification of the inflectional system:

> the influence of lexical aspect interacts with narrative structure, suggesting that the investigation of either one alone provides only a partial picture of interlanguage tense-aspect use. (2000:335-6)

Unlike Bardovi-Harlig and other studies, the approach at hand used a fourfold distinction in categories of grounding. A descriptive analysis of narrative structures revealed that there were several clauses in each transcript which could not easily be classified as FG or BG according to the definitions previously used in the literature. Therefore, the categories of ¬FOC and AMB were added to the analysis. They were used to classify instances of reduced focus and ambiguous grounding status (for definitions of the categories see sections 3.2.4.3 and 3.2.4.4). While the instances of AMB were negligible in the data, FOC turned out to be an important addition to the analysis, as the results were distinctly different from both BG and FG, but showed more similarity to the FG. For future research, an even more fine-grained analysis of instances summarized under this category might prove fruitful.

It has to be borne in mind that even with the most delicate analytical tools, "interlanguage competence cannot be examined directly" (Lakshmanan & Selinker 2001:393). Researchers always use their own perspective to interpret the data at hand. Therefore, we can only reveal tendencies and provide evidence for a certain hypothesis, but we will never be able to conclusively prove that the learners actually adhere to such assumptions in the interlanguage hypotheses. While this study could only focus on one specific approach to the data, i.e. the so-called L2 perspective, future research in the field might profit from multiple focus designs to minimize the comparative fallacy. In addition to the L2 perspective, interlanguage perspective methodologies such

as introspection might prove useful, as well as approaches which take the L1 perspective into account. It may, for instance, be beneficial to use several coders with different linguistic backgrounds to increase the reliability of the analysis, such as bilingual coders and native speakers of L1 and of the target language. A large-scale comparative study of such codings might show the differences of the notions native speakers both of the L1 and the L2 have about the categories in question.

At the end of this study, though bearing all these caveats in mind, it can be stated unmistakably that the results of this data set do not only reflect the strong increase in knowledge about the target language over four years of immersion elementary schooling. They also underscore the children's remarkable creative potential when tackling the challenging task of narrating a story in their second language.

7. References

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Results of Statistical Analysis

V-ing

Aspect Tokens (%)				Aspect Types (%)			
Category	Category	p	T	Category	Category	p	T
ACCVing	ACHVing	1,000	0,765	ACCVing	ACHVing	1,000	0,988
	ACTVing	0,002	-3,667		ACTVing	0,000	-4,372
	STAVing	0,000	5,915		STAVing	0,000	5,604
ACHVing	ACCVing	1,000	-0,765	ACHVing	ACCVing	1,000	-0,988
	ACTVing	0,000	-4,432		ACTVing	0,000	-5,359
	STAVing	0,000	5,150		STAVing	0,000	4,616
ACTVing	ACCVing	0,002	3,667	ACTVing	ACCVing	0,000	4,372
	ACHVing	0,000	4,432		ACHVing	0,000	5,359
	STAVing	0,000	9,582		STAVing	0,000	9,976
STAVing	ACCVing	0,000	-5,915	STAVing	ACCVing	0,000	-5,604
	ACHVing	0,000	-5,150		ACHVing	0,000	-4,616
	ACTVing	0,000	-9,582		ACTVing	0,000	-9,976

FG Tokens (%)				FG Types (%)			
Category	Category	p	T	Category	Category	p	T
FGACCVing	FGACHVing	1,000	0,353	FGACCVing	FGACHVing	1,000	0,552
	FGACTVing	0,059	-2,604		FGACTVing	0,006	-3,339
	FGSTAVing	0,000	5,765		FGSTAVing	0,000	5,509
FGACHVing	FGACCVing	1,000	-0,353	FGACHVing	FGACCVing	1,000	-0,552
	FGACTVing	0,021	-2,957		FGACTVing	0,001	-3,891
	FGSTAVing	0,000	5,412		FGSTAVing	0,000	4,956
FGACTVing	FGACCVing	0,059	2,604	FGACTVing	FGACCVing	0,006	3,339
	FGACHVing	0,021	2,957		FGACHVing	0,001	3,891
	FGSTAVing	0,000	8,369		FGSTAVing	0,000	8,848
FGSTAVing	FGACCVing	0,000	-5,765	FGSTAVing	FGACCVing	0,000	-5,509
	FGACHVing	0,000	-5,412		FGACHVing	0,000	-4,956
	FGACTVing	0,000	-8,369		FGACTVing	0,000	-8,848

BG Tokens (%)				BG Types (%)			
Category	Category	p	T	Category	Category	p	T
BGACCVing	BGACHVing	1,0000	-0,965	BGACCVing	BGACHVing	1,0000	-0,966
	BGACTVing	0,0000	-8,077		BGACTVing	0,0000	-8,077
	BGSTAVing	1,0000	-0,385		BGSTAVing	1,0000	-0,385
BGACHVing	BGACCVing	1,0000	0,965	BGACHVing	BGACCVing	1,0000	0,966
	BGACTVing	0,0000	-7,112		BGACTVing	0,0000	-7,111
	BGSTAVing	1,0000	0,580		BGSTAVing	1,0000	0,581
BGACTVing	BGACCVing	0,0000	8,077	BGACTVing	BGACCVing	0,0000	8,077
	BGACHVing	0,0000	7,112		BGACHVing	0,0000	7,111
	BGSTAVing	0,0000	7,692		BGSTAVing	0,0000	7,692

BGSTAVing	BGACCVing	1,0000	0,385	BGSTAVing	BGACCVing	1,0000	0,385
	BGACHVing	1,0000	-0,580		BGACHVing	1,0000	-0,581
	BGACTVing	0,0000	-7,692		BGACTVing	0,0000	-7,692

FOC Tokens (%)				FOC Types (%)			
Category	**Category**	**p**	**T**	**Category**	**Category**	**p**	**T**
focACCVing	focACHVing	1,000	0,318	focACCVing	focACHVing	1,000	0,347
	focACTVing	0,378	-1,869		focACTVing	0,268	-2,019
	focSTAVing	0,041	2,733		focSTAVing	0,043	2,710
focACHVing	focACCVing	1,000	-0,318	focACHVing	focACCVing	1,000	-0,347
	focACTVing	0,179	-2,186		focACTVing	0,113	-2,365
	focSTAVing	0,099	2,415		focSTAVing	0,114	2,363
focACTVing	focACCVing	0,378	1,869	focACTVing	focACCVing	0,268	2,019
	focACHVing	0,179	2,186		focACHVing	0,113	2,365
	focSTAVing	0,000	4,601		focSTAVing	0,000	4,728
focSTAVing	focACCVing	0,041	-2,733	focSTAVing	focACCVing	0,043	-2,710
	focACHVing	0,099	-2,415		focACHVing	0,114	-2,363
	focACTVing	0,000	-4,601		focACTVing	0,000	-4,728

Grounding Tokens (%)				Grounding Types (%)			
Category	**Category**	**p**	**T**	**Category**	**Category**	**p**	**T**
BGVing	FGVing	0,299	1,655	BGVing	FGVing	0,134	2,023
	focVing	0,805	1,111		focVing	0,864	1,066
FGVing	BGVing	0,299	-1,655	FGVing	BGVing	0,134	-2,023
	focVing	1,000	-0,545		focVing	1,000	-0,958
focVing	BGVing	0,805	-1,111	focVing	BGVing	0,864	-1,066
	FGVing	1,000	0,545		FGVing	1,000	0,958

V-ø

Aspect Tokens (%)				Aspect Types (%)			
Category	**Category**	**p**	**T**	**Category**	**Category**	**p**	**T**
ACCVø	ACHVø	0,192	2,157	ACCVø	ACHVø	0,405	1,836
	ACTVø	0,022	2,942		ACTVø	0,295	1,978
	STAVø	1,000	-1,310		STAVø	1,000	-0,918
ACHVø	ACCVø	0,192	-2,157	ACHVø	ACCVø	0,405	-1,836
	ACTVø	1,000	0,785		ACTVø	1,000	0,142
	STAVø	0,004	-3,467		STAVø	0,038	-2,754
ACTVø	ACCVø	0,022	-2,942	ACTVø	ACCVø	0,295	-1,978
	ACHVø	1,000	-0,785		ACHVø	1,000	-0,142
	STAVø	0,000	-4,252		STAVø	0,025	-2,896
STAVø	ACCVø	1,000	1,310	STAVø	ACCVø	1,000	0,918
	ACHVø	0,004	3,467		ACHVø	0,038	2,754
	ACTVø	0,000	4,252		ACTVø	0,025	2,896

FG Tokens (%)				FG Types (%)			
Category	Category	p	T	Category	Category	p	T
FGACCVø	FGACHVø	0,946	1,418	FGACCVø	FGACHVø	1,000	1,039
	FGACTVø	0,077	2,509		FGACTVø	0,242	2,061
	FGSTAVø	0,227	-2,088		FGSTAVø	0,788	-1,514
FGACHVø	FGACCVø	0,946	-1,418	FGACHVø	FGACCVø	1,000	-1,039
	FGACTVø	1,000	1,091		FGACTVø	1,000	1,022
	FGSTAVø	0,003	-3,506		FGSTAVø	0,068	-2,553
FGACTVø	FGACCVø	0,077	-2,509	FGACTVø	FGACCVø	0,242	-2,061
	FGACHVø	1,000	-1,091		FGACHVø	1,000	-1,022
	FGSTAVø	0,000	-4,597		FGSTAVø	0,003	-3,575
FGSTAVø	FGACCVø	0,227	2,088	FGSTAVø	FGACCVø	0,788	1,514
	FGACHVø	0,003	3,506		FGACHVø	0,068	2,553
	FGACTVø	0,000	4,597		FGACTVø	0,003	3,575

BG Tokens (%)				BG Types (%)			
Category	Category	p	T	Category	Category	p	T
BGACCVø	BGACHVø	1,000	0,245	BGACCVø	BGACHVø	1,000	0,400
	BGACTVø	0,000	-4,271		BGACTVø	0,000	-4,278
	BGSTAVø	0,142	-2,276		BGSTAVø	0,121	-2,338
BGACHVø	BGACCVø	1,000	-0,245	BGACHVø	BGACCVø	1,000	-0,400
	BGACTVø	0,000	-4,516		BGACTVø	0,000	-4,679
	BGSTAVø	0,074	-2,521		BGSTAVø	0,040	-2,738
BGACTVø	BGACCVø	0,000	4,271	BGACTVø	BGACCVø	0,000	4,278
	BGACHVø	0,000	4,516		BGACHVø	0,000	4,679
	BGSTAVø	0,284	1,994		BGSTAVø	0,321	1,940
BGSTAVø	BGACCVø	0,142	2,276	BGSTAVø	BGACCVø	0,121	2,338
	BGACHVø	0,074	2,521		BGACHVø	0,040	2,738
	BGACTVø	0,284	-1,994		BGACTVø	0,321	-1,940

FOC Tokens (%)				FOC Types (%)			
Category	Category	p	T	Category	Category	p	T
focACCVø	focACHVø	1,000	-0,591	focACCVø	focACHVø	1,000	-0,613
	focACTVø	1,000	-0,444		focACTVø	1,000	-0,464
	focSTAVø	1,000	-0,003		focSTAVø	1,000	-0,003
focACHVø	focACCVø	1,000	0,591	focACHVø	focACCVø	1,000	0,613
	focACTVø	1,000	0,146		focACTVø	1,000	0,149
	focSTAVø	1,000	0,588		focSTAVø	1,000	0,610
focACTVø	focACCVø	1,000	0,444	focACTVø	focACCVø	1,000	0,464
	focACHVø	1,000	-0,146		focACHVø	1,000	-0,149
	focSTAVø	1,000	0,442		focSTAVø	1,000	0,461
focSTAVø	focACCVø	1,000	0,003	focSTAVø	focACCVø	1,000	0,003
	focACHVø	1,000	-0,588		focACHVø	1,000	-0,610
	focACTVø	1,000	-0,442		focACTVø	1,000	-0,461

Grounding Tokens (%)				Grounding Types (%)			
Category	Category	p	T	Category	Category	p	T
BGVø	FGVø	0,820	-1,099	BGVø	FGVø	0,095	-2,164
	focVø	1,000	0,580		focVø	1,000	0,361
FGVø	BGVø	0,820	1,099	FGVø	BGVø	0,095	2,164
	focVø	0,285	1,679		focVø	0,037	2,525
focVø	BGVø	1,000	-0,580	focVø	BGVø	1,000	-0,361
	FGVø	0,285	-1,679		FGVø	0,037	-2,525

V-s

Aspect Tokens (%)				Aspect Types (%)			
Category	Category	p	T	Category	Category	p	T
ACCVs	ACHVs	1,000	0,009	ACCVs	ACHVs	1,000	-0,152
	ACTVs	1,000	0,702		ACTVs	1,000	1,069
	STAVs	1,000	-0,634		STAVs	1,000	-1,044
ACHVs	ACCVs	1,000	-0,009	ACHVs	ACCVs	1,000	0,152
	ACTVs	1,000	0,693		ACTVs	1,000	1,221
	STAVs	1,000	-0,643		STAVs	1,000	-0,892
ACTVs	ACCVs	1,000	-0,702	ACTVs	ACCVs	1,000	-1,069
	ACHVs	1,000	-0,693		ACHVs	1,000	-1,221
	STAVs	1,000	-1,335		STAVs	0,214	-2,113
STAVs	ACCVs	1,000	0,634	STAVs	ACCVs	1,000	1,044
	ACHVs	1,000	0,643		ACHVs	1,000	0,892
	ACTVs	1,000	1,335		ACTVs	0,214	2,113

FG Tokens (%)				FG Types (%)			
Category	Category	p	T	Category	Category	p	T
FGACCVs	FGACHVs	1,000	0,076	FGACCVs	FGACHVs	1,000	-0,373
	FGACTVs	1,000	0,359		FGACTVs	1,000	0,662
	FGSTAVs	0,952	1,414		FGSTAVs	1,000	1,021
FGACHVs	FGACCVs	1,000	-0,076	FGACHVs	FGACCVs	1,000	0,373
	FGACTVs	1,000	0,283		FGACTVs	1,000	1,035
	FGSTAVs	1,000	1,338		FGSTAVs	0,987	1,395
FGACTVs	FGACCVs	1,000	-0,359	FGACTVs	FGACCVs	1,000	-0,662
	FGACHVs	1,000	-0,283		FGACHVs	1,000	-1,035
	FGSTAVs	1,000	1,056		FGSTAVs	1,000	0,359
FGSTAVs	FGACCVs	0,952	-1,414	FGSTAVs	FGACCVs	1,000	-1,021
	FGACHVs	1,000	-1,338		FGACHVs	0,987	-1,395
	FGACTVs	1,000	-1,056		FGACTVs	1,000	-0,359

BG Tokens (%)				BG Types (%)			
Category	Category	p	T	Category	Category	p	T
BGACCVs	BGACHVs	1,000	-1,083	BGACCVs	BGACHVs	1,000	-1,102
	BGACTVs	0,100	-2,410		BGACTVs	0,084	-2,477
	BGSTAVs	0,000	-6,616		BGSTAVs	0,000	-6,396
BGACHVs	BGACCVs	1,000	1,083	BGACHVs	BGACCVs	1,000	1,102
	BGACTVs	1,000	-1,327		BGACTVs	1,000	-1,375
	BGSTAVs	0,000	-5,533		BGSTAVs	0,000	-5,294

BGACTVs	BGACCVs	0,100	2,410	BGACTVs	BGACCVs	0,084	2,477
	BGACHVs	1,000	1,327		BGACHVs	1,000	1,375
	BGSTAVs	0,000	-4,206		BGSTAVs	0,001	-3,919
BGSTAVs	BGACCVs	0,000	6,616	BGSTAVs	BGACCVs	0,000	6,396
	BGACHVs	0,000	5,533		BGACHVs	0,000	5,294
	BGACTVs	0,000	4,206		BGACTVs	0,001	3,919

FOC Tokens (%)				FOC Types (%)			
Category	Category	p	T	Category	Category	p	T
focACCVs	focACHVs	1,000	-0,854	focACCVs	focACHVs	1,000	-0,737
	focACTVs	0,557	-1,688		focACTVs	0,544	-1,699
	focSTAVs	1,000	0,680		focSTAVs	1,000	0,684
focACHVs	focACCVs	1,000	0,854	focACHVs	focACCVs	1,000	0,737
	focACTVs	1,000	-0,833		focACTVs	1,000	-0,962
	focSTAVs	0,758	1,534		focSTAVs	0,940	1,421
focACTVs	focACCVs	0,557	1,688	focACTVs	focACCVs	0,544	1,699
	focACHVs	1,000	0,833		focACHVs	1,000	0,962
	focSTAVs	0,112	2,368		focSTAVs	0,108	2,383
focSTAVs	focACCVs	1,000	-0,680	focSTAVs	focACCVs	1,000	-0,684
	focACHVs	0,758	-1,534		focACHVs	0,940	-1,421
	focACTVs	0,112	-2,368		focACTVs	0,108	-2,383

Grounding Tokens (%)				Grounding Types (%)			
Category	Category	p	T	Category	Category	p	T
BGVs	FGVs	0,889	1,047	BGVs	FGVs	1,000	0,941
	focVs	1,000	0,299		focVs	1,000	0,361
FGVs	BGVs	0,889	-1,047	FGVs	BGVs	1,000	-0,941
	focVs	1,000	-0,748		focVs	1,000	-0,580
focVs	BGVs	1,000	-0,299	focVs	BGVs	1,000	-0,361
	FGVs	1,000	0,748		FGVs	1,000	0,580

V-ed

Aspect Tokens (%)				Aspect Types (%)			
Category	Category	p	T	Category	Category	p	T
ACCVed	ACHVed	1,000	-0,190	ACCVed	ACHVed	1,000	-0,789
	ACTVed	0,000	-4,955		ACTVed	0,056	-2,619
	STAVed	0,001	3,936		STAVed	0,000	4,480
ACHVed	ACCVed	1,000	0,190	ACHVed	ACCVed	1,000	0,789
	ACTVed	0,000	-4,765		ACTVed	0,411	-1,830
	STAVed	0,000	4,126		STAVed	0,000	5,268
ACTVed	ACCVed	0,000	4,955	ACTVed	ACCVed	0,056	2,619
	ACHVed	0,000	4,765		ACHVed	0,411	1,830
	STAVed	0,000	8,891		STAVed	0,000	7,098
STAVed	ACCVed	0,001	-3,936	STAVed	ACCVed	0,000	-4,480
	ACHVed	0,000	-4,126		ACHVed	0,000	-5,268
	ACTVed	0,000	-8,891		ACTVed	0,000	-7,098

FG Tokens (%)				FG Types (%)			
Category	**Category**	**p**	**T**	**Category**	**Category**	**p**	**T**
FGACCVed	FGACHVed	1,000	-0,581	FGACCVed	FGACHVed	1,000	-0,762
	FGACTVed	0,000	-7,102		FGACTVed	0,000	-5,034
	FGSTAVed	0,001	3,781		FGSTAVed	0,002	3,697
FGACHVed	FGACCVed	1,000	0,581	FGACHVed	FGACCVed	1,000	0,762
	FGACTVed	0,000	-6,521		FGACTVed	0,000	-4,271
	FGSTAVed	0,000	4,362		FGSTAVed	0,000	4,459
FGACTVed	FGACCVed	0,000	7,102	FGACTVed	FGACCVed	0,000	5,034
	FGACHVed	0,000	6,521		FGACHVed	0,000	4,271
	FGSTAVed	0,000	10,883		FGSTAVed	0,000	8,730
FGSTAVed	FGACCVed	0,001	-3,781	FGSTAVed	FGACCVed	0,002	-3,697
	FGACHVed	0,000	-4,362		FGACHVed	0,000	-4,459
	FGACTVed	0,000	-10,883		FGACTVed	0,000	-8,730

BG Tokens (%)				BG Types (%)			
Category	**Category**	**p**	**T**	**Category**	**Category**	**p**	**T**
BGACCVed	BGACHVed	0,392	-1,851	BGACCVed	BGACHVed	0,376	-1,870
	BGACTVed	0,010	-3,194		BGACTVed	0,011	-3,145
	BGSTAVed	1,000	-0,224		BGSTAVed	1,000	-0,324
BGACHVed	BGACCVed	0,392	1,851	BGACHVed	BGACCVed	0,376	1,870
	BGACTVed	1,000	-1,342		BGACTVed	1,000	-1,274
	BGSTAVed	0,630	1,627		BGSTAVed	0,740	1,547
BGACTVed	BGACCVed	0,010	3,194	BGACTVed	BGACCVed	0,011	3,145
	BGACHVed	1,000	1,342		BGACHVed	1,000	1,274
	BGSTAVed	0,020	2,970		BGSTAVed	0,031	2,821
BGSTAVed	BGACCVed	1,000	0,224	BGSTAVed	BGACCVed	1,000	0,324
	BGACHVed	0,630	-1,627		BGACHVed	0,740	-1,547
	BGACTVed	0,020	-2,970		BGACTVed	0,031	-2,821

FOC Tokens (%)				FOC Types (%)			
Category	**Category**	**p**	**T**	**Category**	**Category**	**p**	**T**
focACCVed	focACHVed	1,000	0,111	focACCVed	focACHVed	1,000	0,072
	focACTVed	0,017	-3,020		focACTVed	0,083	-2,482
	focSTAVed	1,000	0,774		focSTAVed	1,000	0,794
focACHVed	focACCVed	1,000	-0,111	focACHVed	focACCVed	1,000	-0,072
	focACTVed	0,012	-3,131		focACTVed	0,068	-2,554
	focSTAVed	1,000	0,663		focSTAVed	1,000	0,722
focACTVed	focACCVed	0,017	3,020	focACTVed	focACCVed	0,083	2,482
	focACHVed	0,012	3,131		focACHVed	0,068	2,554
	focSTAVed	0,001	3,794		focSTAVed	0,007	3,276
focSTAVed	focACCVed	1,000	-0,774	focSTAVed	focACCVed	1,000	-0,794
	focACHVed	1,000	-0,663		focACHVed	1,000	-0,722
	focACTVed	0,001	-3,794		focACTVed	0,007	-3,276

Grounding Tokens (%)				Grounding Types (%)			
Category	Category	p	T	Category	Category	p	T
BGVed	FGVed	0,000	-5,701	BGVed	FGVed	0,000	-4,509
	focVed	0,000	-7,623		focVed	0,000	-7,144
FGVed	BGVed	0,000	5,701	FGVed	BGVed	0,000	4,509
	focVed	0,168	-1,923		focVed	0,027	-2,635
focVed	BGVed	0,000	7,623	focVed	BGVed	0,000	7,144
	FGVed	0,168	1,923		FGVed	0,027	2,635

V-irreg

Aspect Tokens (%)				Aspect Types (%)			
Category	Category	p	T	Category	Category	p	T
ACCVirreg	ACHVirreg	0,002	-3,706	ACCVirreg	ACHVirreg	0,056	-2,622
	ACTVirreg	1,000	1,293		ACTVirreg	1,000	0,911
	STAVirreg	0,000	-4,595		STAVirreg	0,000	-4,472
ACHVirreg	ACCVirreg	0,002	3,706	ACHVirreg	ACCVirreg	0,056	2,622
	ACTVirreg	0,000	4,998		ACTVirreg	0,003	3,533
	STAVirreg	1,000	-0,899		STAVirreg	0,393	-1,850
ACTVirreg	ACCVirreg	1,000	-1,293	ACTVirreg	ACCVirreg	1,000	-0,911
	ACHVirreg	0,000	-4,998		ACHVirreg	0,003	-3,533
	STAVirreg	0,000	-5,884		STAVirreg	0,000	-5,383
STAVirreg	ACCVirreg	0,000	4,595	STAVirreg	ACCVirreg	0,000	4,472
	ACHVirreg	1,000	0,899		ACHVirreg	0,393	1,850
	ACTVirreg	0,000	5,884		ACTVirreg	0,000	5,383

FG Tokens (%)				FG Types (%)			
Category	Category	p	T	Category	Category	p	T
FGACCVirreg	FGACHVirreg	0,000	-4,128	FGACCVirreg	FGACHVirreg	0,030	-2,831
	FGACTVirreg	0,251	2,046		FGACTVirreg	0,524	1,717
	FGSTAVirreg	0,000	-5,561		FGSTAVirreg	0,000	-4,782
FGACHVirreg	FGACCVirreg	0,000	4,128	FGACHVirreg	FGACCVirreg	0,030	2,831
	FGACTVirreg	0,000	6,174		FGACTVirreg	0,000	4,548
	FGSTAVirreg	0,919	-1,433		FGSTAVirreg	0,314	-1,951
FGACTVirreg	FGACCVirreg	0,251	-2,046	FGACTVirreg	FGACCVirreg	0,524	-1,717
	FGACHVirreg	0,000	-6,174		FGACHVirreg	0,000	-4,548
	FGSTAVirreg	0,000	-7,607		FGSTAVirreg	0,000	-6,499
FGSTAVirreg	FGACCVirreg	0,000	5,561	FGSTAVirreg	FGACCVirreg	0,000	4,782
	FGACHVirreg	0,919	1,433		FGACHVirreg	0,314	1,951
	FGACTVirreg	0,000	7,607		FGACTVirreg	0,000	6,499

BG Tokens (%)				BG Types (%)			
Category	Category	p	T	Category	Category	p	T
BGACCVirreg	BGACHVirreg	0,864	-1,466	BGACCVirreg	BGACHVirreg	0,760	-1,533
	BGACTVirreg	0,518	-1,722		BGACTVirreg	0,604	-1,648
	BGSTAVirreg	0,000	-4,254		BGSTAVirreg	0,000	-4,205
BGACHVirreg	BGACCVirreg	0,864	1,466	BGACHVirreg	BGACCVirreg	0,760	1,533
	BGACTVirreg	1,000	-0,256		BGACTVirreg	1,000	-0,115
	BGSTAVirreg	0,034	-2,788		BGSTAVirreg	0,048	-2,672

BGACTVirreg	BGACCVirreg	0,518	1,722	BGACTVirreg	BGACCVirreg	0,604	1,648
	BGACHVirreg	1,000	0,256		BGACHVirreg	1,000	0,115
	BGSTAVirreg	0,072	-2,532		BGSTAVirreg	0,067	-2,557
BGSTAVirreg	BGACCVirreg	0,000	4,254	BGSTAVirreg	BGACCVirreg	0,000	4,205
	BGACHVirreg	0,034	2,788		BGACHVirreg	0,048	2,672
	BGACTVirreg	0,072	2,532		BGACTVirreg	0,067	2,557

FOC Tokens (%)				**FOC Types (%)**			
Category	**Category**	**p**	**T**	**Category**	**Category**	**p**	**T**
focACCVirreg	focACHVirreg	0,032	-2,811	focACCVirreg	focACHVirreg	0,023	-2,916
	focACTVirreg	1,000	0,090		focACTVirreg	1,000	0,034
	focSTAVirreg	1,000	1,332		focSTAVirreg	1,000	1,326
focACHVirreg	focACCVirreg	0,032	2,811	focACHVirreg	focACCVirreg	0,023	2,916
	focACTVirreg	0,024	2,901		focACTVirreg	0,021	2,950
	focSTAVirreg	0,000	4,143		focSTAVirreg	0,000	4,242
focACTVirreg	focACCVirreg	1,000	-0,090	focACTVirreg	focACCVirreg	1,000	-0,034
	focACHVirreg	0,024	-2,901		focACHVirreg	0,021	-2,950
	focSTAVirreg	1,000	1,241		focSTAVirreg	1,000	1,292
focSTAVirreg	focACCVirreg	1,000	-1,332	focSTAVirreg	focACCVirreg	1,000	-1,326
	focACHVirreg	0,000	-4,143		focACHVirreg	0,000	-4,242
	focACTVirreg	1,000	-1,241		focACTVirreg	1,000	-1,292

Grounding Tokens (%)				**Grounding Types (%)**			
Category	**Category**	**p**	**T**	**Category**	**Category**	**p**	**T**
BGVirreg	FGVirreg	1,000	-0,905	BGVirreg	FGVirreg	1,000	-0,565
	focVirreg	1,000	0,970		focVirreg	1,000	0,811
FGVirreg	BGVirreg	1,000	0,905	FGVirreg	BGVirreg	1,000	0,565
	focVirreg	0,187	1,875		focVirreg	0,512	1,376
focVirreg	BGVirreg	1,000	-0,970	focVirreg	BGVirreg	1,000	-0,811
	FGVirreg	0,187	-1,875		FGVirreg	0,512	-1,376