The Map and the Rope

Finnish Nominal Inflection as a Learning Target

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ABSTRACT

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The morphophonological stem changes which occur in the Finnish nominal inflection are studied from the learners' viewpoint. The method of the study is eclectic: three kinds of data are discussed against the background of several models of morphology and language acquisition.

Test data were collected from learners and native speakers who were asked to inflect context-free real and nonce words. These data are subjected to both qualitative and quantitative analysis. The second data-type consists of interviews with learners, and the third was collected from the spontaneous utterances and writing of learners. The latter two types of data are qualitatively analyzed.

All informants are adults with at least secondary education and represent many linguistic and cultural backgrounds. They have received formal teaching in Finnish and have been exposed to Finnish while visiting or living in Finland.

The morphological issues discussed in the study are centred around the basic question of using rules vs. paradigms in the description of the nominal inflection. The mental representation of morphological information is approached from the angles of classification, memory and processing mechanisms. Several recent models of morphological processing are reviewed. The data are used to determine to what extent the various models explain the morphological products of learners of Finnish.

The study concludes that the production of Finnish inflectional forms by learners is based on more than one processing mechanism. The acquisition of Finnish morphology presents many types of cognitive problem, and the solutions need not be uniform in nature either. While rule descriptions may be well-suited to limited areas of morphology, they may be of little use in others. Analogical production has advantages in certain areas, and some features must be learned by rote. An attempt is made to find the best possible fit between the problematic areas of morphology and acquisition devices.

The acquisition process of morphology is described as developing a native-like relief map of the morphological system. Both natural language acquisition and explicit teaching provide the learner with material for the rope which is necessary for climbing the hills on the map.

CONTENTS

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We Finns, linguists and laymen alike, have lived surrounded by Finnish, thinking and communicating in it from our very first years. Later, school and academic education have moulded our views of it. Our knowledge of the language is unavoidably fused with these experiences. It is not possible for us to start from the beginning, with a clean slate, and examine the language as an object, without prejudice. To do this we need learners of Finnish, people who come to meet the language from the outside. Learners are naturally saddled with their own expectations and linguistic backgrounds, but when a sufficient number of them are involved, it can be hoped that some fragments of an unbiased view begin to emerge.

It is, therefore, the learners of Finnish who are to be thanked for shaping my knowledge of the Finnish language. I have taught Finnish as a second or foreign language in many different settings and for many nationalities since 1973. Over the years I have observed the behaviour of learners of Finnish, and this experience has profoundly influenced my views on morphology and its acquisition processes. I have also been involved in writing teaching materials and developing teacher education and testing procedures for the field, both in Canada and Finland. This work has given me the opportunity to discuss the Finnish language and its acquisition with several hundred people who are involved in teaching Finnish for foreigners. Their experiences and views have been invaluable to me.

The Finnish Academy research project *Finnish as a Second and Foreign Language* made it financially possible to concentrate solely on this project for the winter of 1992–1993. The project group of Eija Aalto, Sirkku Latomaa, Pirkko Muikku-Werner, Kirsti Siitonen, and Minna Suni, headed by Professor Kari Sajavaara, have provided me with unfailing support and innumerable opportunities for discussion, not to mention all the fun we had in the many meetings and seminars we have arranged and attended. The reviewers of the manuscript, Professors Matti Leiwo and Heikki Paunonen made many worthwhile suggestions for the improvement of the study. The former is also responsible for the initial push towards research in linguistics.

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1 INTRODUCTION

The locus of this study is that sparsely populated area where the disciplines of Finnish Language research and Applied Linguistics — or more specifically, the study of second language acquisition — meet. The task of this introductory chapter is to locate it within this space, as well as to state and describe the research problem. Arguments for the choices and limitations of the study are also presented, methodological standpoints fixed, and the structure of the study outlined.

The Finnish nominal inflection has not previously been described as a learning task. Thus my overall research question is: What are the essential features of the central area of the Finnish nominal inflection as a system to be learnt? Other questions derived from this are: How do learners inflect nominals? Does the description of the system influence learning? Can new light be shed on the learning of inflection by recent models of language processing and acquisition?

Why this topic?

Because Finnish has so many case endings Finns and foreigners alike claim that it is a "difficult" language. Prepositions in the "easy" Indo-European languages, however, outnumber the Finnish cases, often have similar functions, and are equally unpredictably used. This counterargument usually satisfies Finns, while foreigners who have learnt at least some Finnish know better: it is not the case endings but the stem shapes which are bothersome in the early stages of learning.

Why do Finns, apart from specialists in the Finnish language, not notice the stem alternations? One answer is that for an adult Finn they are automatic. We only notice them when small children make mistakes or somebody inflects a rare word in a way which sounds wrong to us. Then we chuckle or correct, but rarely analyze the problem in any way.

The other answer is that stem alternations seem to have no function: words with a pure agglutinative inflection (like *talo : taloa : talon : taloja* 'house'[1]) do their job just as well as those with many changes of stem over the paradigm (like *käsi : kättä : käden : käsiä* 'hand'). One of the universal features of language is that grammatical forms tend to have a function. No attention needs to be paid to something which is established in a language but has no apparent function.

How have the stem alternations survived in Finnish if they have no function? They generally have a historical explanation: certain sound combinations have changed, causing parts of the paradigm to drift apart. One would expect, however, that such paradigms would eventually tend to simplify. This has happened to some extent, for instance the word *ori* 'stallion' has lost its unique inflection in standard Finnish. Nevertheless, certain frequent paradigms have managed to maintain their uniqueness (such as *mies : miestä : miehen : miehiä* 'man'), and others (like *käsi*) have the support of several other frequent items which are inflected similarly. It has been suggested that there is a systemic force which holds the paradigms and inflectional types together (Paunonen 1976, 60). Changes tend to disrupt this system: a simplification in one paradigm may lead to homonymity with a part of another paradigm.

There is another reason for the stability of this complex system. Learners of Finnish often point out a contradiction: the stress in Finnish is on the first syllable of each word, while the last syllable(s) may be swallowed or mumbled. Yet learners are urged to listen for the end of each word, since important morphological and syntactic information is located there. Fluent speakers of Finnish manage to understand each other in spite of this, relying on additional information provided by word order, redundancy, and predictions of possible forms based on long experience. It is feasible, however, that the reduction of word-final sounds is partly made possible by stem alternations: speakers do not interpret what they hear solely on the basis of the endings, as grammars and textbooks would have us believe, but use the stem form to predict or replace the ending (see e.g. Leiwo 1982).

Thus historical, systemic and communicative reasons all contribute to the existence and survival of the Finnish nominal inflection system. For a learner, it is a hurdle to overcome. In the early stages of learning Finnish both students and teachers tend to regard inflection as an extremely central feature of Finnish — probably as more essential than it really is for successful communication. Be that as it may, if learners and teachers perceive a phenomenon in a language as being both important and difficult, it is reason enough to focus a research effort on the area.

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[1]All translations of Finnish material, data and quotations alike, are by the author. For the sake of brevity, only one translation equivalent has been given for words used as examples. More alternatives are included if the meaning of the word is essential for the discussion in some way.

Another reason for the choice of the research topic is that most studies on adult acquisition of inflection concern English, which "has a notoriously impoverished morphology" (Jackendoff 1975, 669). Quite often models of language acquisition claim to be universal, but contain no examples of morphology. Material from a language in which morphology has a more central role provides a more stringent test for these models.

The acquisition of Finnish as a second or foreign language[2] has previously received scant attention. In general, the linguistic products of learners have often been considered marginal and exceptional, together with pidgins, creoles, dying languages, simplified registers (foreigner talk, motherese, etc.), special registers like therapy talk, legal and bureaucratic language, malapropisms (slips), aphasic language or the language of children or bilingual speakers (Menn & Obler 1982; Wode 1982). However, even a brief look at this list of items formerly confined to the "linguistic curiosity shop" (Wode 1982, 20) shows that a great deal of what we say and write belongs to one of the "exceptional" categories above.

Learners' utterances have no place in the study of the Finnish language if the theoretical framework is one where the only informant allowed is the ideal speaker-hearer, the mythical perfect adult with no special interests, who "never makes jokes or waxes metaphorical, has not been to law school or cluttered up his or her brain with a second or third language" (Gleason 1982, 347). Since the early 1980s, however, a growing number of linguists, in Finland and elsewhere, have come to believe that the study of a variety of language forms is exactly what is needed to form a comprehensive view of language. The study of learner language is one such source for a multifaceted description of Finnish.

The linguist and the teacher

Both linguistic and pedagogical needs underlie the choice of the topic. The connection between these two disciplines, i.e. the structure of knowledge necessary for language teaching, is here seen as consisting of three steps:

> (1) The linguistic description of the phenomena to be learnt and the formation of a theory or model, either before the description (deductively) or after it (inductively).

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[2]The name of the field has yet to be stabilized. For the school subject the name Finnish as a Second Language has been proposed, after the Swedish model (Svenska som andraspråk, Svenska 2). Both English as a Second Language (ESL) and English as a Foreign Language (EFL) are used, while in Germany the field is generally called Deutsch als Fremdsprache. Each name has its proponents and opponents, and there are also those who wish to use both, depending on the situation. Opinions differ as to where the line should be drawn between "second" and "foreign". This discussion in Finland has been summarized by Latomaa and Tuomela (1993). Their recommendation to use *Finnish as a Second Language* will be followed here, partly contradicting my earlier reasoning (see Martin 1991b), except when specifically referring to Finnish teaching abroad.

(2) Synthesizing and choosing the information contained in the description, to transform it into a form to be utilized in teaching. This involves consideration of pscyholinguistic factors and various constraints inherent in a language learning and teaching situation, as well as of different types of learners.

(3) Writing the curriculum and teaching materials.

In the field of Finnish as a Second Language we have many descriptions of Finnish morphology on level 1. The amount of work on level 3 is steadily increasing, as the number of teachers and learners grows, but is often without a sound or explicit theoretical base. The connection between the two, represented by level 2, is either missing or left for individual teachers to make. This is where second language acquisition (hereafter SLA) research meets Finnish language research: the existing SLA models in themselves are not self-evidently sufficient for Finnish, and neither are the existing descriptions of Finnish automatically useful for learners. Thus the goal of this study is to synthesize and choose among the ways morphology has been described, to synthesize and choose among the ways language learning has been described, and to bring the results together to explain how Finnish nominals are inflected. In the words of Kohonen (1993): "A real voyage of exploration is not looking for new lands but seeing the old ones with new eyes."

Limitations of the present study

Previous studies on learning Finnish morphology as an adult are very few in number and limited in scope (Aalto 1991; Martin 1990, 1991, 1992, 1993d, 1995a, 1995b; morphological notes are also included in Hautoniemi 1990 and a few other M.A. studies). It is not possible to cover all of Finnish morphology in this study either: only a small central area, the stem forms of common nominal types in some frequent cases, can be taken up for consideration.[3] The choice is functional in the sense that it is the common words, common forms, and the basic morphological processes for expressing case and number that learners must acquire before graduating to the more marginal areas of rarely used cases, ordinal numbers, comparison, or possessive inflection, which have been left outside this study.

Even within the small area of morphology defined above, many problems of language acquisition remain untouched. Two of them are quite significant: the reception of inflected nominals and the automatization of the system, which is required for smooth production.

[3]The morphology of verbs is naturally as essential for the learner as the nominal inflection, but it has been excluded here to keep the data within manageable limits. It is possible, however, that many of the conclusions of this work can be extended to verbs in a later study.

For the language learner and the learning process, reception precedes production and acquisition. Forms cannot be produced or learned without intake. But to study reception effectively one must be very familiar with the system to be studied. Reception experiments cannot be planned without knowledge of the problematic areas in the acquisition of Finnish morphology, and it is this which the present study attempts to provide. Furthermore, the parameters of reception involve many areas related not only to morphology but to phonetics and some areas of psychology, such as the workings of memory and other cognitive skills. Thus, reception definitely merits a separate study. It is quite possible, however, that reception experiments would reveal new information, which would influence the results of this study. If this turns out to be the case, the description of Finnish nominal inflection for learners must then be altered accordingly.

The second omission — the automatization process — has been and is studied by many cognitive psychologists and SLA researchers. There is reason to believe that the path from declarative knowledge of language to fluent automatic production is similar regardless of the items to be learnt: in other words it is not language-specific. Since research on learning Finnish is only beginning, it is more justified to concentrate on features which international research can illuminate in a more restricted scope. Inflectional morphology is such an area, since the language system to be learnt is rather peculiar in this respect.

The data and the informants

The methodological choices have been made with the above limitations in mind. Information about the object of study, the Finnish nominal inflection as a learning task, has been sought from two main sources. One is the Finnish language itself, as spoken by native speakers of Finnish and as described in grammars, dictionaries, textbooks, and research papers. The other is learners' linguistic behaviour, as reflected in their products, and in their views of Finnish. All these sources are utilized here, set against the background of certain cognitive models as well as models of morphology. The spirit of the study is deliberately eclectic: no model is predestined to doom or glory, but useful features of different models are combined in the search of explanations.

The data is collected from adult learners of Finnish as a second language. Their backgrounds vary, but all have read textbooks and received at least some formal instruction in Finnish. All have also spent some time in Finland and thus been exposed to informal input. Altogether over 60 people are involved, ages varying from about 18 to 55. All informants have received at least secondary education in their home country. Their overall skills of Finnish can broadly be said to be at the intermediate level.

There are three types of data: test data about the inflection of individual words, introspective interviews, and data from various speaking and writing situations. The data types overlap to some extent. Some informants have been involved in all three situations, some in two, some have only produced a few writing samples. The data and the informants are described in more detail in Chapter 4.

The focus is on the cross-section of interlanguage[4] (IL) development at the intermediate level. Individual differences in cognitive structure and interactional opportunities obviously affect learning, but as the target is the nominal inflection system of learners as a group, variety in these respects can be considered an enrichment, not a problem. As I am not looking at the learning process of any individual, no longitudinal data or input data have been collected.

One of the starting points here is that some language learning is conscious, some unconscious and what is learned in formal teaching can also become material for unconscious processing (see 2.3.). Consequently, I will also use the terms language acquisition and language learning as synonyms. For the first language, 'acquisition' is more accurate, but in the area of SLA the two are often both theoretically and practically inseparable. As my informants are adults learning Finnish both within and outside classrooms, there is little point in trying to separate the two kinds of learning; that is unless a certain output is clearly a result of a certain teaching incident.

The measuring stick

A major problem in this study is the definition of the limits of acceptability. Which of the linguistic products of learners are within the normal variation of Finnish, and which are only typical of interlanguage? The problem has two facets: the question of linguistic norms and the question of the production process.

The question of linguistic norms and their influence on research paradigms has been thoroughly discussed by Dufva (1992, 29–54). She argues that we still depend on the official written norm, in spite of many statements on the equality of language forms in the recent history of linguistics. This, she concludes, is due to "the need of regularity, which is not purely linguistic, but also social" (p. 43). It may also be psychological, and the same striving for regular systems and flawless classifications may make it difficult to approach the "marginal" forms of language (see 2.1.). In the study of learner language it is unlikely that an elegant and regular system will emerge.

Comparison with the official standard is blatantly unfair: if native speakers deviate from it, why should learners not be allowed the same liberties? It is very difficult to find any other base for comparison, however; we simply do not know enough about how Finns actually speak. (See also Lauranto 1995 and Martin 1995c). Offhand, many linguists would claim that the native speakers'

[4]For the term interlanguage, see e.g. Selinker (1992).

control of morphology — certainly in the core area covered in this study — is complete. This, however, does not seem to be the case, as is shown by the test data in Chapter 5.

The deviant products of learners often resemble those of native speakers, as will be seen in Chapter 7. Correct utterances always do. Is there nevertheless a difference in the production process? In some cases there seems to be reason to believe so, at other times there is no such evidence. In addition to the official standard, or the behaviour of a control group of native speakers, another source for criteria of acceptability often used in linguistics is the intuition of the researcher. My intuition, however, has been eroded by decades of contacts with speakers of other languages, and is no longer quite trustworthy. Therefore, I will try to circumvent the problems of acceptability by using many kinds of data and combining evidence from different sources to achieve as high a degree of reliability as possible.

Outline

All study of language is based on some notion of the ontology of language: what is knowing a language? Theories, models and opinions abound in linguistics, psychology, sociology, pedagogy, neurology and, most recently, cognitive science. It is not possible even to start to review such a voluminous literature here.[5] In this study I will concentrate on the areas of language learning and production. Within these I choose to concentrate on categorization, storage and access, procedural and declarative knowledge, and strategic models (Chapter 2). This choice of aspects is influenced partly by the questions raised by the data, partly by the desire to consider some recently proposed models in the light of a new set of data. Together with models of morphology and descriptions of Finnish morphology (Chapter 3) these form a backdrop for the analysis of learner language. The data is presented and analyzed in Chapters 4–7. In Chapter 8 the findings are discussed in the context of the concepts and models presented in Chapters 2 and 3. Thus, the majority of the interplay between the theoretical views and the actual data is concentrated in Chapter 8. Finally (Chapter 9), the practical implications of the results are discussed.

[5]For a Finnish reader, a very good overview of the most important theories of language processing and acquisition, albeit from the viewpoint of testing, can be found in Huhta (1993).

2 LANGUAGE LEARNING AS A COGNITIVE TASK

How the brain handles the task of understanding and producing language is a crucial issue both in psychology and linguistics, and it has been a particularly popular topic over the past quarter century. Some of this work on the cognitive factors and models which affect language learning and processing will be discussed in this chapter.

It is neither possible nor sensible to review here even briefly all trends and directions, let alone individual models and theories. For this reason I limit my account to a selective overview of some of the recent discussions which seem promising in explaining the data at hand. The order of presentation is from the general to the specific, starting with some issues which deal with classification in general, not solely with language. Then concepts and models of native language processing will be discussed, followed by and overlapping with models of language learning.

2.1 The nature of categories

Classification is an important question in all study of human behaviour and thinking, including language. Linguistic theories usually assume classical categories which can be characterized by distintive features, although this is not often explicitly stated (Lakoff 1987, 58). The issue is particularly crucial in the Fennistic tradition, where presenting extensive sets of well-classified data is sometimes equated with good research.

The formalist view of language seems to take for granted that linguistic phenomena are classifiable. Whatever does not fit in the categories — whether predetermined or formed on the basis of the data in question — is marginal and not interesting. Another feature of this way of structuring knowledge is that a great deal of research effort is spent on surveying all possible incidences of each

phenomenon and discussing exceptions, in the search for exhaustiveness. Nor are functionalist descriptions of language necessarily any less keen on categorizing examples — only the criteria for classes are different.

The nature of categories is a perennial topic of discussion among philosophers; the need to classify seems to be one of the basic cognitive factors in human thinking and very important to all sciences. In his extensive study of categories Lakoff (1987, xii–xv) contrasts the nature of categories in two competing views of the world: objectivism and experientalism. He lists notions common to both of these views, including the recognition that reality places constraints on concepts, and a conception of truth that goes beyond mere internal coherence. The basic opposition between the views is that thought in objectivism, according to Lakoff, is mechanical, atomistic, abstract, and disembodied. It is logical only in a narrow technical sense. Thought in experientalism is embodied, imaginative, non-atomistic and has an ecological structure. For linguistics, and this study in particular, the most important difference between the two is the nature of categories.

In the objectivist view, categories are clearcut and all specimens in a given category share the same properties. No member of a category has a special status, but all — since they share the same properties — are equal. In the experiental view, the boundaries between categories are fuzzy, and not all members of a category share exactly the same properties but resemble at least some other members of the category, at least in some ways. These in turn resemble some other members in other ways, thus linking the specimens in a category to each other. Some members of a category are more prototypical than others, i.e. they have more properties in common than the more marginal members. (Lakoff 1987, xv.)

Lakoff's view of categories is based on the work of many philosophers and psychologists. He charts the development from classical categories to experiental categories by quoting research from Ludwig Wittgenstein to Eleanor Rosch (Lakoff 1987 12–57). Two kinds of studies are essential in this development: some attempt to extend the traditional theory in such a way as to accommodate data which does not seem to fit into classical categories, while others lead to new theory formation. Both introduce new concepts, such as family resemblances, central/prototypical and noncentral members, and fuzzy sets.

As the ability to use language is a central cognitive skill, linguistic categories should be of the same type as other categories in the conceptual system and the study of language could benefit from the results of studies in classification. Conversely, "evidence about the nature of linguistic categories should also contribute to a general understanding of cognitive categories. Because language has such a rich category structure and because linguistic evidence is so abundant, the study of linguistic categorization should be one of the prime sources of evidence for the nature of category structure in general" (Lakoff 1987, 58). Thus, in linguistic categories, for instance that of noun, there are prototypical members and there are marginal ones, the membership of which is motivated by their relationship to the central members (Lakoff 1987, 289–290). Categories can be defined by less than perfect similarities, the way

members of a family resemble each other, and the boundaries between categories are not always clearly demarcated.

Particularly important to the development of the theory of categories is the work of Rosch (1978), who has introduced new tools for thinking about categories, such as basic level concepts, prototype effects, and cue validity. Basic level concepts are commonly used in semantics. An example of prototype effects in linguistic categories can be seen in the concept of markedness. Cue validity is further discussed below, in connection with the Competition Model.

Although prototype effects were first described as mental representations, Rosch (according to Lakoff 1987, 43) later came to the conclusion that prototype effects, defined operationally by experiments, underdetermine mental representations. The effects constrain the possibilities of what the representations might be, but there is no one-to-one correspondence between the effects and the mental representations. This is an obviously important limitation when the relationship between linguistic competence and performance (in the Chomskyan sense) is studied.

The sources for prototype effects can be found in propositional structures, in image-schematic structures and in metaphoric and metonymic mappings (Lakoff 1987, 68, 113–114). Some concepts used by linguists, such as frame or schema, can also be seen as sources of prototype effects which may rise from the interaction of one schema with another (Lakoff 1987, 70). These concepts have been little utilized in the study of Finnish, with the exception of Lakoff's ideas of metaphors as providers of mappings between categories, which have been applied to Finnish by Onikki & Nikanne (1992). What Lakoff sees as the main problem with earlier models of categorization is that they only include the propositional sources for effects. For the study of an area like Finnish morphology it may suffice to a large extent, but other sources cannot be totally excluded either. It is conceivable, for instance, that the speaker's imagery may influence morphology by changing the inflectional category of the word. Some examples of this will be discussed in Section 5.6.

Lakoff also presents several cognitive models involving different types of category structure which are interesting for the study of morphology. A radial structure "is one where there is a central case and conventionalized variation on it which cannot be predicted by general rules" (Lakoff 1987, 84). In other words, in a radial structure, variations have to be learned; categories that can be generated by general principles are not radial structures. Nor are radial structures the cases where the central case is more general and the (noncentral) others simply have more properties, but not different ones. An example of this type of category in Finnish morphology is the stem formation of two-syllable nominals with the nominative ending in an *-i*, where the choice of the stem vowel cannot be predicted by any general principle.

Categories can also form chains, in which central members are linked to others by one feature, these to others by another feature, and so on. Neighbouring specimens share properties, whether they belong to the same category or not, while specimens at the opposite edges of one category do not necessarily share any features. Such chains can be found in Finnish nominal inflection, as is shown (independently of Lakoff) by Paunonen (1976).

Categories can contain typical examples, salient examples, ideals, and paragons as well as generators, which generate new cases (Lakoff 1987, 86–90). There are also general principles which work in categorization. Some which are important in morphology are centrality (basic members of a category are more central), specificity (specific knowledge overrides general knowledge), and motivation (general principles make sense of categorization but they do not motivate it). The links between chains can be characterized not only by facts but also by myths and beliefs, as well as by experiential domains. It is also important to recognize that conceptual systems have the category "other". This category has no linking, chaining, central members, etc. (Lakoff 1987, 95–96; see also Pirzig 1991, 32–36).

A reason why many linguists have shied away from the question of what categories are like and have either accepted the classical theory or left the matter to philosophers or psychologists is the competence—performance distinction: experimental results or samples of spontaneous speech or writing can be said to be matters of mere performance. Also, as generative grammar is defined as being independent of general cognitive abilities, cognitive categories do not matter (Lakoff 1987, 179–182). In the life of a language learner, however, performance matters. It is the understanding and production of language which is needed for communication. Some learners claim that they know the necessary part of the system (= have competence), but cannot get words to come out of their mouths. Although it is doubtful that there could be full competence without any performance, it is clear that the two cannot be completely separated. Furthermore, when a study is based on actual language data, it is the performance of learners which is analyzed, and competence can only be approached obliquely.

Another counterargument to Lakoff's views about categories, as far as Finnish morphology goes, is to say that morphological alternation is conventional and not based on any conceptual categorization.[6] Some conceptual categories, however, are present in grammar. Lakoff draws his examples from grammatical classification in Dyirbal. One can also find examples of this in Finnish morphology: semantic considerations are used not only in choosing the case endings but also in allocating words into inflectional classes. For example, the NS (Nykysuomen sanakirja) class 65 (*kalleus*-type, see 3.2.3 about word-types in Finnish) is defined by a conceptual classification as the one which includes names of properties or characteristics. More generally, derivational factors, which depend on conceptual classifications, often also determine the inflection of words. (See also Martin 1995a.)

It may also be true that the ideal speaker who has learnt the system perfectly and never errs has little use for conceptual categories in morphology. But variation, be it diachronic or synchronic, individual or dialectal, is caused by something and must have a cognitive basis. This cognitive basis is what the adult learner has, although it may differ in some ways from that of a native

[6]With the exception of radial categories, which are based on conventional variation, and might well be applied to Finnish morphology. The possibilities of this will be explored in Chapter 8.

speaker. Thus, the effects of categorization are an important factor in learning. Nor is the existence of classical cognitive models denied by Lakoff; he acknowledges that there are parts of human knowledge where categories have rigid boundaries and are defined by necessary and sufficient conditions (Lakoff 1987, 153).

One of the weaknesses of Lakoff's theory, as well as of many other theories which come from the English-speaking countries, is that morphological questions are hardly mentioned. The only reference by Lakoff to a study of prototype effects in morphology (p. 62–63) is to Bybee & Moder (see Section 3.1). Of course, this does not exclude the possibility of applying Lakoff's ideas in the area of morphology, where categorization is traditionally very important.

In many ways natural language seems to defy strict categorization. Linguists have dealt with this problem by limiting their data or by assigning a part of it to the marginal areas as miscellaneous, unimportant, untypical, erroneous or sporadic. A theory which allows left-overs and fuzzy boundaries solves this problem, but creates others, such as the potential inability to present a coherent description at all. This may reflect on the practical level of language teaching: many people — although not all — have a strong urge to have clearcut categories. This may be partly cultural, as the frequency of this behaviour seems to vary by the background of the learners, as many teachers have noted. But it may also be a feature of a certain type of cognitive structure, since individual students who act in this manner can be found among all ethnic or national groups. This relationship between the descriptions of language and the needs of the students will be further explored in Chapter 9.

2.2 Storage and retrieval

Human beings need to produce words and word-forms at a great speed to express their communicative and social intentions. As the number of potential word-forms is thousands, if not millions, it is not surprising that problems of lexical storage and access are central in psycholinguistics.

It is neither possible nor necessary here to go into the details of how human memory functions. Some assumptions of memory must be postulated, however, to form a starting point for this study. I am only concerned with the part of memory which is needed for understanding and particularly for producing word-forms. Most of what is presented here is common to many models of language production.

I assume that memory consists of what I will call the intake, storage and retrieval faculties. Intake faculties consist of reception, analysis and storage attribution. In one way or another the flow of language is received, analyzed and sorted into such a form and such units as are suitable for storage. This information is then allocated some means of storage, be it space or something else, as in the connectionist models (see 2.4).

The function of the storage is simply to hold onto the received and analyzed information, in case it will be needed. The way morphological information is stored, be it as memorized forms, as basic forms connected with certain rules, as basic forms connected with analogical models, or as some other kind of representation will be discussed in Sections 2.4.–2.7.

The retrieval faculties search for information and transform it into some suitable form for production. The intake, storage and retrieval faculties must naturally bear some resemblance to each other since they must be able to handle the same information. However, I do not assume that intake and retrieval necessarily mirror each other, nor do I offer an opinion on whether their resemblance is structural or functional in nature. Gleason, for instance, argues for separate productive and receptive systems on the basis of evidence from studies in dying languages, child phonology and aphasic grammar (1982, 354). The SAID model (see later in this chapter) also assumes differences between input and output lexicons. In the Competition Model (see 2.4.) comprehension and production share the same set of representations (determined by cue validity), but a different set of cue cost factors are at work in each modality. Comprehension is governed by uncertainty. In production the commitment to well-formedness is more important. (Bates & Devescovi 1989, 229.)

Retrieval is not identical with production — or else we could only say what we have heard before. Production obviously involves physiological components, like the coordination of muscles required for articulation or writing, but also a creative element must be assumed. One way to bridge the gap between retrieval and production is offered by Morrison & Low (1983). They suggest that human language depends on both creative and critical faculties. The creative faculty uses the internal reservoir of stored rules and patterns and assembles strings of language for private consumption or for articulation as utterances. At the same time the critical faculty is aware of what has been created and checks, either before or after articulation, for "the frequent slips of the tongue, grammatical errors, social infelicities and other deviations from intention that characterize normal speech" (1983, 228). They also argue that the creative faculty operates beyond the back edge of consciousness and is therefore inherently unruly. The critical faculty, which is essentially our awareness of language, gives lease to the creative faculty, keeps it in check, and possibly learns from it. The critical faculty (called monitoring by Morrison & Low) is linked to planning and repair and is essential to learning.

Descriptions of lexical storage are generally based on some type of categorization; it is hard to imagine how words and forms could be retrieved from a totally unorganized storage. Most theories further acknowledge that, for each word, at least two types of information need to be stored: semantic and phonological. This however, is seldom enough, as languages normally also have syntactic constraints for the use of words, as well as morphological features which require attention at the level of words as well. Most studies, however, ignore the latter two types of information. This is natural, since they are conducted by psychologists, rather than by linguists, and concern individual words, mainly in English (for an overview, see Marslen-Wilson 1992, particularly Forster's article).

There are several competing views about the ways words may be stored and retrieved. They concentrate on a few parameters, which include the order of processing (top-down vs. bottom-up; semantics first vs. phonology first, from the beginning vs. from the end of the word), the organization of processing (serial vs. parallel), and the nature of storage (representations vs. connections). The storage can be imagined to be random, or by semantic categories, or in dictionary form, etc. (see e.g. Forster 1992). The search may involve one or more stages or levels (see e.g. Butterworth 1992). A multitude of methods (shadowing, priming, reaction time measurements for naming latency or lexical decision, etc.) have also been developed for the study of these factors (see e.g. Niemi, Laine & Koivuselkä-Sallinen 1991, 119). As morphology is generally not involved, and morphological production even less, I will only outline a few selected notions from these studies in the following, partly as a background for this study in general, partly because they will be referred to in the discussion of the data.

As suffixation is the crucial morphological device in Finnish, the order of processing within the word is of importance. A model which emphasizes the beginning of the word in processing is the Cohort Model proposed by Marslen-Wilson (1987). This model assumes discrete recognition elements for each lexical unit, with functional coordination of the bundle of phonological, morphological, syntactic, and semantic properties defining a given lexical entry. Elements are activated by appropriate patterns in the sensory input. The level of activation of each element increases as a function of the goodness of fit of the input pattern to the form specifications for each element. (Marslen-Wilson 1992a, 6–7.) Words are thus recognized from the beginning: first all words beginning in the same way are activated and, as processing proceeds, the ones which do not fit the pattern any longer are rejected until only one remains.

The Cohort Model deals with uninflected words. The models which include derivation and inflection, and which have mostly been developed for computerized analysis of language, can be divided into affix-stripping models and root-driven models (Hankamer 1992). The first parses the word starting from the end, the latter from the beginning, narrowing down the potential choice of elements based on the categorization of the previously recognized one.

Although both types of model seem to work for English, there are strong arguments in favour of the root-driven models in agglutinative languages. Such models have been independently developed for Finnish (Koskenniemi 1983), Turkish (Hankamer 1988) and Quechua (Kasper & Weber 1982, according to Hankamer 1992). In these models the root is first recognized by matching a lexical form in the storage with the initial substring of the word to be parsed. Suffixes are then recognized iteratively. In a language like Finnish the stem allomorph often limits the number of possible suffixes. Each suffix yields a new stem which determines the possible class of the succeeding suffix. (Hankamer 1992, 401). Thus lexical processing is assumed to proceed from left to right. The opposite direction of processing in agglutinative languages would lead to massive search procedures as there would be far fewer ways of limiting the classes of potential candidates to match the substrings on the left. Furthermore, the left-to-right recognition and parsing also appears psychologically more

realistic: particularly in languages where words are long, starting to process them only after the whole word is available would lead to a waste of processing time.

Another much-discussed question, which is of prime importance for this study, is the extent of the parsing of word-forms. There are basically three ways in which morphological forms can be listed in the lexicon:

> (1) All forms are listed without representation of internal structure or other morphological features; or
> (2) All forms are listed with some representation of morphology (such as rules or a membership of a category); or
> (3) Only morphemes are listed, information about their combinations being elsewhere.
> (Cf. Hockett 1954; Gleason 1982; Hankamer 1992; Martin 1993d.)

These three views are mutually incompatible. In addition, there is the possibility that different languages employ different ways of listing morphological items, or that one language employs different systems for different parts of morphology.

Jackendoff (1975) suggests that inflected forms are stored in two parts (morphemes). Stemberger (1985) provides evidence for this from speech errors. Stemberger and MacWhinney (1988, 112) conclude that irregular forms are stored, but do not take a stand on the question of how they are stored. High-frequency regular inflected forms are stored as bimorphemic or with lexically conditioned inflectional rules, while low-frequency regular forms are not stored at all.

Recently, Niemi, Laine & Tuominen have addressed this question. They have presented a processing model of Finnish nouns, which they call the Stem Allomorph/Inflectional Decomposition model (SAID; see Niemi, Laine & Tuominen 1994). It is based on several reading, reaction time, and eye-movement experiments on normal and aphasic subjects. They conclude that the representations of inflected noun forms (with the exception of the most frequent ones) are decomposed in the input and central lexicons, while derived noun forms are not. For the output lexicon the SAID model predicts that both inflected and productive derived forms have decomposed representations.[7] The representations are allomorphic, not deep forms from which allomorphs would be generated. The model requires further testing, however, as some conclusions are based only on the evidence from two dyslexic informants. The findings of the authors of the SAID model will be compared with those provided by my data in Chapter 8.

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[7]It is not clear what the relationship of the input and output lexicon is in the model. If the productive derived forms are decomposed in the output lexicon, but not in the input lexicon, the two cannot be identical.

2.3 Procedural and declarative knowledge

Language learning involves a complex interaction of many cognitive processes. A central issue in the models of this interaction is the relationship between procedural and declarative knowledge[8]. These concepts also relate to the distinction between language learning processes and learning strategies, as well as to the role of competence and performance, which will also be briefly discussed in this chapter.

Procedural knowledge here refers to the ability to produce linguistic forms and the store of knowledge on which this ability is based. Declarative knowledge is the ability to express information about this production process and the underlying knowledge, and the elements of language which participate in linguistic production. It is actually often the role assigned to these two types of knowledge which distinguishes SLA models from each other (see e.g. Huhta 1993).

The context of language learning affects the representation of knowledge about this language. People who have explicitly been taught rules or other ways of organizing their linguistic information are generally better at expressing this knowledge than those who have acquired seemingly similar production skills in communication situations, without formal instruction. This issue will be further explored in Section 4.3. and Chapter 6, although it is difficult to determine whether this is a matter of having the right vocabulary accessible or a real difference in competence.

There is an abundance of evidence from multilingual communities all over the world that children and adults alike can acquire languages without formal instruction, and claims to the contrary have therefore never been made. The other extreme position in this discussion is that declarative knowledge does not help language acquisition at all, and that the only value of the classroom teaching of languages is that it provides input for learners to digest. Krashen (1978) has often been interpreted as arguing for the latter position, although this interpretation requires a very narrow view of acquisition. In any case, for a while it became important to distinguish sharply between language learning (in the classrom) and acquisition (in a natural context).

Recent research has shown that explicit teaching does have a role in language acquisition. Michael Long (1991), after conducting an extensive survey of SLA research, concludes that classroom learning has several advantages as opposed to spontaneous acquisition. It speeds up the rate of learning, is beneficial to long-term accuracy and appears to raise the ultimate level of attainment. It does not change the order of acquisition or the fact that there is movement back and forth (often called U-shaped behaviour: see, for example, Kellerman 1985). Learners do not move from ignorance to mastery at one step, or, in Pienemann's words (1984), learnability determines teachability. Long also

[8]Word pairs such as *implicit* and *explicit* or *unconscious* and *conscious* are often used to refer to the same distinction.

lists several caveats concerning, for instance, the individual differences within a group of learners.

Most current models of language learning — for instance those of Bialystok (1982, 1991), Sharwood Smith (1986), Levelt (1989), McLaughlin (1990), and Bates & McWhinney (1987, 1989) — take into account both the declarative and procedural side of human information processing. Often they are seen as a continuum, as for example by J. R. Anderson (1980), who has divided the general learning process into three stages. The first one is the instructional or the study phase, which he also calls the cognitive, interpretative or declarative stage. The outcome of this is an "internal and probably declarative representation of what the learner must do". At the second, the associative stage, in which methods for performing the skill are worked out, declarative information is transformed into procedural form. It is possible, however, that the two forms of knowledge coexist side by side. At the third, the autonomous stage, the procedure becomes more and more rapid and automatic. (Anderson 1980, 220 ff.) As to the nature of each kind of knowledge, he assumes that declarative knowledge is possessed in an all-or-none manner, while procedural knowledge can be partly possessed. Declarative knowledge is acquired suddenly, by means of explicit instruction, procedural knowledge gradually, by performing the skill. (Anderson 1976, 117.) As the material used in this study is collected from learners who have had at least some formal instruction in Finnish, Anderson's model seems to describe their course of learning quite well, as will be seen in Chapter 6.

In the foregoing the word *process* refers to the course of learning, and this is one of the two senses in which it is used in this study. However, since this is a study of morphology, rather than a longitudinal study of learning, it more often refers to the event of producing a word-form, the *production process*. In both meanings it is related to procedural knowledge; in my view processes are directly dependent on procedural knowledge and only indirectly on declarative knowledge. The latter, in turn, is related to the learning and production strategies.

The cognitive task of language learning can be seen as a continuum of *processes* and *strategies* (Faerch & Kasper 1983b, Bialystok & Sharwood Smith 1985, Ellis 1994, 529–560). General communication processes/strategies, on the one hand, and general learning processes/strategies, on the other hand, are the most global ones, followed by more specific language learning processes/strategies. A classification of communication strategies used in language learning with examples from various levels of language (phonology, morphology, syntax, lexicon) can be found in Tarone, Cohen & Dumas 1983. Understanding and producing the L2 in turn requires its own processes/strategies, and at the other end of the continuum are the subsets of those which are required for articulation, inflection, and sentence and text processing. It is these specific inflectional processes/strategies that are focused upon in this study: the production process refers to what happens in the mind of a language learner as s/he produces inflected forms. Strategy here refers to what the learner knows about the process, the ways s/he tries to affect the

process, for instance by employing declarative knowledge. Unlike processes, strategies are thus at least potentially conscious plans used for production.

Research into learner strategies is based on the view that language learning is essentially problem-solving and that the stages of interlanguage represent the various stages of this task. Whether a complete solution — native competence — is ever achieved or not, is outside the domain of this study. Studies of learner strategies have been performed by Rubin (1987, 15–30), who based her thinking on the ideas of Carton (1966, 1971). According to Carton, learning is largely dependent on the ability and propensity to make valid, rational, and reasonable inferences. Inferences, and consequently strategies, use three types of cues: intralingual, which are supplied by the target language, interlingual (such as cognates and regularities between L1 and L2), and extralingual, the knowledge of the real world. Learners vary in their ability to use these cues and in their tolerance of risk, which in turn is related to progress in language learning.

In addition to the inferencing and risk-taking abilities, many other factors influence the use of procedural vs. declarative knowledge in learning. Such factors include language learning experience. In his experiment with monolingual and multilingual subjects McLaughlin found that multilinguals were better at implicit learning, i.e. when they were told to learn a certain minilanguage but not told how to. They did not differ from monolinguals at explicit learning, i.e. when they were told that there were regularities in the material and these should be utilized in learning. He also found that multilinguals were not better at learning artificial vocabulary items, but went about the task in a different way than the monolinguals. (McLaughlin 1990, 113–128).

It has also been suggested that learners at different levels of learning use different strategies in understanding language (Tarone 1979; for Finnish, see Tarnanen 1993, 89). Alanen (1992) in her experiment varied the nature and amount of declarative information given to learners and found that the presentation of the material to be learnt influences learning. The choice of the strategy is thus not only influenced by the cognitive structure and learning style of the individual learner. Since strategies on the whole have a minor role in this study, it is not necessary here to go into a more detailed definition of various types and characteristics of strategies. In addition to the studies mentioned above, these can be found, for instance, in Wenden 1987b or O'Malley & Chamot 1990.

Some language processing strategies, such as overgeneralization, crosslinguistic influence and simplification, are considered universal in interlanguage studies. The operation of these strategies accounts for a good proportion of learner errors and the changing nature of the learner's interlanguage system (Wenden 1987a, 3). This is also true of this study. However, to call the above notions strategies, as Wenden does, one must bear in mind the nature of consciousness. Although learners are able to discuss the notions which linguists call overgeneralization, crosslinguistic influence and simplification, when called upon to do so, they do not necessarily consciously employ them as strategies in production.

That the borderline between procedural and declarative knowledge, or between processes and strategies, is by no means clear is illustrated by Rubin's list of processes, which includes such actions as clarification/verification, monitoring, memorization, guessing/inductive inferencing, deductive reasoning and practice as cognitive processes (1980, 118). Many of these activities, however, involve both procedural and declarative knowledge and can be seen as processes or as strategies, depending on the nature of the activity or the part of the activity in focus.

As strategies are at least partly dependent on declarative knowledge, they are more available for research than processes which can only be studied through indirect evidence. In this study both sides of inflectional production are approached: strategies via interviews with and comments by learners, and processes via an interpretation of their products. Some items, such as self-corrections and searches for the correct form give evidence for both. It may, however, be impossible to determine exactly how much each contributes to learning. It is also possible that some parts of language are easier to learn via the declarative route, some through the procedural one, as will be suggested in Chapter 9.

The questions of procedural and declarative knowledge can also be seen as related to the questions of competence and performance, although the nature of the relation depends on the view adopted of these concepts. If language is considered to be innate and separate from other cognitive abilities, and performance is of little or no interest, as in the most extreme forms of the TG paradigm, the whole question does not really arise: we are not aware of competence, and what we are aware of does not matter. If, on the other hand, both competence and performance are seen as something to which both implicit and explicit learning can contribute, the question becomes more interesting: as all language teachers know, the fact that learners know something is not always reflected in their performance.

Sharwood Smith (1986, 12–13) has examined the issue of competence[9] and control. In many interlanguage studies it has been found that a learner has acquired a 100 per cent target-like analysis of some area of the language system, but stills fails in performance. This competence-without-performance situation leads Sharwood Smith to conclude that a rule or principle may be acquired (in the competence sense) long before full control over it is established. This course of events, which is in accordance with Anderson's view of learning presented above, could be due to inherent processing problems or to the low priority assigned to the item. Finnish morphology offers ample opportunity for both explanations: word-forms are often quite complex, and the information contained in the morphological units is often redundant (as in the case of adjective agreement) and therefore given low priority by the learner.

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[9]Sharwood Smith's use of the term *competence* is not identical with the TG-meaning of the term, but refers rather to the ability of the learner to use a certain linguistic feature at least some of the time.

In Sharwood Smith's view competence comes first, control later. The learner searches for a system in the target language and occasionally has an insight which takes the form of an analysis of the data. It then becomes a part of the learner's IL grammar. Competence, which Sharwood Smith defines as "abstract mental representations of a whole set of linguistic principles, describable by linguists in terms of rules and conditions (constraints) on those rules, some of which are given and some of which are created on exposure to relevant data" (Sharwood Smith 1986, 14), changes in complex ways, not all of which can be linked with a recent encounter with primary language data. Control mechanisms access knowledge in the long-term memory and integrate the various bits of the information. In production the learner leans more on the well-controlled earlier acquired part of the competence than the newly analyzed parts. In other words, performance does not mirror competence, and the declarative knowledge that the learner has may exceed her/his procedural knowledge.

Another way to solve the issue at hand is to dismiss the competence vs. performance distinction altogether. Suggestions along these lines have been made by the connectionists (see 2.4). Among those writing about the Finnish language, similar ideas have recently been presented by Skousen (1989), Dufva (1992) and Määttä (1994). Whether this view will become the mainstream remains to be seen. In any case, the distinction between procedural and declarative knowledge appears useful for the purposes of this study, where the learners' background involves many types of input which seem to produce different types of learning.

2.4 Mechanisms of processing: rules, connections, analogy and competition

A significant ongoing debate in cognitive science is between rule-based and connectionist models of language (see e.g. Fodor & Pylyshyn 1988; Pinker & Prince 1988; Lachter & Bever 1988; MacWhinney & Leinbach 1991, and more extensively, Lima & Corrigan & Iverson 1994). The current rule-based models are descendants of the transformational-generative theories of language, although the line of descent is not easy to detect, as many generations of models have been superimposed on Chomsky's original ideas. An important assumption underlying these models is that human beings possess innate knowledge. Connectionist models cluster around the Parallel Distributed Processing framework of McLelland and Rumelhart. In what follows only some of the most central features of each group of models are discussed.

The majority of approaches to language processing and learning developed before the mid-1980s fall predominantly into what might be called the rule formulation tradition. This work rests on the assumption that the goal of learning is to formulate rules which capture generalizations in a succint way.

This is one of the strengths of these models: large quantities of specimens can be processed in a uniform way.

Rules

An essential concept in a rule-based model is regularity, since rules can determine or produce only dependable behaviour. Linguistic phenomena are seldom absolutely regular, and this creates a problem for rule-based approaches. The problem can be solved by adding to the number of rules and/or organizing them hierarchically, until all phenomena are covered. In an extreme case a separate set of rules may be required for just one specimen. Alternatively, the cases which do not follow the rules can be listed as exceptions, or even left out of the description as marginal. (As a problem concerning the classification of data this was discussed in 2.1.) From the viewpoint of language processing, this means that the value of a rule-based model is dependent on the data: with regular phenomena rule-based models are elegant and economical, with irregular ones they are not. Since languages contain both kinds, another problem arises: is it feasible to describe language processing in two or more different ways or should one strive for a unitary model?

Since most traditional models of language are rule-based, they are not further discussed here, partly because their general principles are well-known, partly because these are so many that it is not possible to cover them in this context. Some of those which specifically refer to (Finnish) morphology are discussed in Chapter 3.

The advance of computers has affected model-development in many ways. Most of the current models have a computational aspect, regardless of the philosophy on which the model is based. Computers are either used to test models which are created on the basis of natural linguistic data, or models are created to take advantage of the information-handling capacities of computers, and their psychological reality is then tested on human-produced data. The first approach is often initiated by the need for practical applications, such as proof-reading, translating or computer-aided analysis of data for research purposes. It is more often rule-based, since the starting point has been the existing grammars, and the rules have been rewritten in a way that can be handled by computers. This work has led to a great increase in precision and new insights into the ways rules can be expressed and organized.

Connections

Connectionist models of language are based on the second approach, that of assuming that some aspects of human information processing can be modelled with the help of computers. Whether this is assumed to be the case by chance or because computers are built by humans who unconsciously may have modelled their own cognitive processes is seldom explicitly expressed. As the capacity of computers and the architecture of programmes have developed, new possibilities have been opened for modelling language. The most promising

models at the moment are the ones based on parallel distributed processing (PDP).

The best known work in this field has been done by McClelland, Rumelhart, and their PDP Research Group. They contrast the basic principles of their model to the earlier ones as follows:

"In most models, knowledge is stored as a static copy of a pattern. Retrieval amounts to finding the pattern in long-term memory and copying it into a buffer or working memory. There is no real difference between the stored representation in long-term memory and the active representation in working memory. In PDP models, though, this is not the case. In these models, the patterns themselves are not stored. Rather, what is stored is the *connection strengths* between units that allow these patterns to be re-created." (Rumelhart & McClelland 1986, 31.)

The implications of this property of PDP models, both for processing and for learning, are enormous. As knowledge in these models is contained in the connections between processing elements (what is connected to what and what the strength of the connection is), learning consists of changing these connections. The representation of the knowledge is set up in such a way that the knowledge necessarily influences the course of processing: using knowledge in processing is no longer a matter of accessing information in memory and retrieving it for use. Knowledge is intertwined in the processing itself. (Rumelhart & McClelland 1986, 32; Elman 1992, 248.)

For the purposes of this study, it is the connectionist experiments with language learning, rather than general cognitive models or processing of the already learnt material, which are the most interesting. As the knowledge is assumed to be stored as the strengths of the connections, Rumelhart and MacClelland define learning to be "a matter of finding the right connection strengths so that the right patterns of activation will be produced under the right circumstances. This is extremely important of this class of models, for it opens up the possibility that information processing mechanism could learn, as a result of tuning its connections, to capture the interdependencies between activations that it is exposed to in the course of processing." (Rumelhart & MacClelland 1986, 32.)

In rule-based models the goal of learning is the formulation of explicit rules. In PDP-based models it is the acquisition of connection strengths which "allow a network of simple units to act *as though* it knew the rules". Powerful computational capabilities are not required of the learning mechanism[10]. Rather, very simple connection strength modulation mechanisms are assumed. They "adjust the strength of connections between units based on information locally available at the connection". (Rumelhart & MacClelland 1986, 32.) Learning happens in networks with input units, output units and hidden units which connect the other two. In these models a network is allowed to run until

[10]It is another matter that extensive PDP applications require vast computational capacity to be able to handle the required number of connections, even if parallel processing reduces the time needed for computing as compared to serial processing. This, however, is not considered a problem for the human brain, since the number of cells and connections in them is immense.

it eventually settles "into a locally optimal state in which as many as possible of the constraints are satisfied, with priority given to the strongest constraints." The system is said to relax into a solution. (Rumelhart, Smolensky, McClelland & Hinton 1986, 9.)

Rumelhart, Hinton and McClelland (1986, 54–55) assume learning to happen in two ways ("paradigms of learning"), called associative learning and regularity discovery. In associative learning one learns that a particular pattern of activation on one set of units is produced whenever another particular pattern occurs on another set of units. These patterns can be arbitrary. Regularity discovery refers to units learning to respond to "interesting" patterns in their input. This forms the basis for knowledge representation in a PDP system. These two modes of learning blend into one another, but can have different goals. Regularity detectors are needed when there is need to discover the features of a single unit. Associative learning is primarily concerned with storing the relationships among subpatterns for future needs. Pattern association can affect two separate subsets of units or it can be auto-association in which the goal is pattern completion: when a portion of the input pattern is presented, the rest of the pattern will be completed or filled in. (Rumelhart, Hinton & J. L. McClelland 1986, 52.) Both modes of learning, however, work on the same principles and there is no need to separate regular and irregular phenomena for processing, as is the case with rule-based models.

Thus in connectionist models, learning a new language amounts to strengthening the correct connections and weakening the incorrect ones until the connection strength patterns resemble those of native speakers of the language. A feature which makes connectionist models attractive is that they allow and explain errors and the process of forgetting. These human problems are included in rule-based models only implicitly, as problems. They are often ignored if the data for model building does not include such phenomena. If it does, they are glossed over as "imperfect learning" or "overgeneralization of the rule", etc. Such phrases give a name to the problem but do not explain why or how it happens.

In connectionist models, errors are a natural part of the learning process. In the early stages, production is practically guesswork, as increments of connection strengths have not yet had a chance to accumulate and the activation of connections is therefore more or less random, but as the amount of input increases and learning progresses, errors become rarer. Even the U-shaped behaviour often found in language acquisition seems to be present in the learning of the computer models (Bybee 1988, 136–137; MacWhinney & Leinbach 1991, 129–130; 146–147). Also, even at the very advanced stages of learning some errors persist, which is also the case in human learning. It is this good fit with the progress of natural learning which is the strong point of connectionist models.

Forgetting what has previously been learnt is also included in the models. Activations of connections are assumed to weaken slowly with time. With no external input the activation of a unit will decay gradually, rather than go directly to zero. (Rumelhart, Hinton & McClelland 1986, 52.) The idea of

imperfect memory is also included in the Analogical Model of Language presented by Skousen (1989, 86–95, see below).

An intense and ongoing debate between the rule-based models and connectionist models followed the publication of the work of the PDP Research Group in 1986. Fodor and Pylyshyn (1988) argue for the necessity of postulating cognitive structures well beyond what is done in the connectionist models. Pinker and Prince (1988) attack the PDP model, together with all other connectionist models of language, by claiming that language cannot exist or be learned inthe manner assumed by the connectionists. They also point out in some detail errors in the model of Rumelhart and McClelland (1987). These are concerned with learning irregular verbs of English, which is the best known PDP application in the area of morphology (see 3.1). Both are convinced of the necessity of learning rules during language acquisition and accuse connectionists of returning to the associationist ideas of 1950s psychology. The verb learning model is also heavily criticized by Lachter and Bever (1988).

The criticism by Pinker and Prince, and Lachter and Bever, is answered, point by point, by MacWhinney and Leinbach (1991). MacWhinney and his colleagues have developed PDP models further and applied them to the learning of German gender and case (MacWhinney et al. 1989, MacWhinney 1994). All in all, the application of connectionist models to language acquisition and processing is still in its early stages. Both sides have sound arguments on their side, and more work will be needed before a decisive stand can be taken — provided it will be necessary at all, as some seeds for a possible combination of the two views of language processing and learning seem to be suggested in MacWhinney 1994 and Pinker & Price 1994.

A less well-known model of language learning is that presented by Royal Skousen (1980, 1987, 1989, 1992a, 1992b; Derwing & Skousen 1994). His Analogical Model has many similarities with connectionist models, but is of special interest here since it has been applied to Finnish morphology.

Skousen's arguments are based on empirical and conceptual problems which are involved in a structural approach to language, and he lists distinctions between the structural and analogical approaches (Skousen 1989, 7). Most of the statements he makes about the analogical approach could be made for connectionist models in general.

The key concept in Skousen's model is analogy. He considers earlier appeals to analogy imprecise and impressionistic, and proposes an explicit definition of analogy (1989, 6). For Skousen, analogy is not only a tool for coping with irregularities, but he claims, as other scholars have as well, that everything in language is analogical (a discussion of the concept of analogy follows below). The basic types of behaviour — categorical, exceptional/regular and idiosyncratic — can all be handled in the same way: transition from one type of behaviour to another is not well-defined (Skousen 1989, 8, 49). The concept of analogy, however, is problematic: the above definition of it is quite general, while in Skousen's application pertaining to Finnish (1980, also in 1989) analogy is quite narrowly presented as the influence between words which differ from each other only by one phonemic feature, or if such pairs are not found in language, by the smallest possible number of features.

The crucial contribution of Skousen's work is that it appears to combine, and even more importantly, quantify, such factors as the similarity of the occurrence to the given context X, the frequency of the occurrence, and whether or not there are intervening occurrences closer to X with the same behaviour (Skousen 1989, 8). It is obvious that these factors are interrelated, but in many models of language processing they are addressed separately, and their relative importance is not specified.

For the role of frequency of occurrence, Skousen employs the term *gang effect*, also used by Rumelhart & McClelland. It affects the chances of selecting a particular occurrence in the analogical set. Such an effect has been commonly referred to as "rule-governed behaviour". In the Analogical Model, the gang effect can be quantitatively defined. In the same way, the similarity of occurrence, or phonological distance, is quantified. This concept can be compared to that of saliency or markedness in some other models. However, the definition of phonological distance, an important feature from the present point of view (see 5.6.), is not altogether clearly explicated in Skousen's applications.

Among the merits of the model are that it can make probabilistic judgements, which, as shown originally by Labov's work, human beings are also capable of. It also functions on variable and less than perfect data, and allows for less than perfect memory (Skousen 1989, 86–95). If a crucial variable is missing, the analogical approach can nevertheless often predict behaviour of a given context (Skousen 1989, 45).

The ability to account for deviant as well as regular behaviour corresponds to the abundant evidence from language usage: people can deal with improperly formed language. An important consequence of this capability is that Skousen's approach eliminates the need for Chomsky's distinction between competence and performance. This is needed in rule-based models because rules account for what is normal, while performance is left to cope with the "violations" of those rules. (Skousen, 76.)

A major problem in the Analogical Model is the selection of the variables which are used in constructing the analogical sets. Skousen claims that "there is no independent description of the data; there is only predicted behaviour for given contexts. Usage is the description, and performance is competence" (ibid., 76). But is the choice of variables for the analysis not a kind of independent description?

The selection of variables in the applications presented in Skousen (1989) is mainly based on phoneme and syllable structure, but sociolinguistic and psychological variables are also suggested. The number of variables is limited to twelve, due to the limitations of the computer programme used. Proximity is an important factor used in selection (Skousen 1993, personal communication). This seems sensible for phonemic variables but is hard to define for others.

Neither is it clear whether Skousen considers his model to be psychologically real. Coates (1990, 43) in his review of it appears to think so, and the term 'mental model' is also used in an article by Derwing and Skousen (1994, 215). If this is the case, the question of the choice of variables becomes even more important: how would the child (or adult learner) who is only

starting to acquire language determine on what to base the analogical sets? In the case of classroom learning explicit teaching could direct the choice of variables, and the effect of teaching itself could be used as a variable, as is suggested by Coates (1990, 43). As with all analogical approaches, this one also involves the problem that in the early stages of language acquisition learners have few and imperfect models for analogy.

How does the Analogical Model differ from other connectionist models? All of them dispense with the need for rules and can predict behaviour when the data is ill-formed or there is missing information, and they also allow for the gang effect. The most important difference, according to Skousen, is that the other models cannot account for the ability to learn given probabilities. Though certain parameters can be defined, there is no systematic way to set those parameters so that predicted probabilities equal actual probabilities. This is because the models based on the work of the PDP Research Group do not actually define a set of occurrences to choose from, but allow the possible outcomes to compete with each other until stability is achieved. Another difference between the Analogical Model and other connectionist models is that the first includes a way to deal with the possibility of alternative rules of usage (Skousen 1989, 81–82). It is not clear, however, whether these possibilities can be included in other models as well. One could also claim that the fact that the parameters in PDP models are not systematically set in advance makes these models psychologically more realistic, since a language learner in a natural situation has no way of knowing in advance what features of the input will prove to be important for learning.

While categorical behaviour — the mainstay of rule-based models — can be accounted for by connectionist models, it may appear that it would be simpler to leave it to the rules. In particular the Analogical Model seems overly complicated in this respect, at least when the rule is very simple like the English *a/an* rule, which Skousen uses as an example. Skousen points this out himself by stating that "using the analogical approach, we find the solution is not easy, yet the same basic results are obtained" (1989, 54).

A predecessor of connectionist models — albeit unlikely to be known to other connectionists but Skousen — could be seen in the field morphology presented by Paunonen (1976). His view of inflectional morphology is based on the connections both within a paradigm and between paradigms. It will be further discussed in Section 3.2.2.

Since both rule-based models and connectionist models are able to predict linguistic behaviour reasonably accurately, their relative merits must be determined on another basis. This is particularly the case with "mature" language, that of an adult native speaker. In the case of learner language the connectionist models seem to have advantages over the rule-based ones as they seem to be better able to handle imperfect data and erratic behaviour (leakage, in Skousen's terms). Both types of models will be referred to when discussing the data of this study.

The concept of analogy

The idea of analogical processing is by no means an innovation. The notion of relational similarity is as old as Aristotle (Anttila 1974, 334). It has traditionally accompanied rule-based models of learning, just as it has helped historical linguists to explain exceptional developments. It has, however, often performed the role of stuntman, to come on the stage when the situation becomes too difficult for the real actor, the rule. Diachronically, this has happened particularly when a sound change has broken the system down and analogy has been employed to fix it again (see e.g. Paunonen 1974, 33–34).

The role of analogy in learning was already pointed out by Herman Paul in the mid-19th century. For him learning a new language in general is based on rules and examples to which rules are applied. In natural language situations rules are abstracted from models ('Muster'; Paul 1960, 111). Analogy, however, has a role in learning the inflection of a foreign language: a number of paradigms are memorized and as new words are learnt, they are allocated to these paradigms. New forms can then be instantly produced on the basis of analogy. First, conscious reference to the paradigm is needed, but gradually learnt words leave their traces in the brain and new forms can be unconsciously produced. Only the common element between the model and the new form enters the consciousness, while differing elements are inhibited. Eventually the process approaches that which occurred during mother tongue learning. (Paul 1960, 112.)

Paul's description sounds very familiar to many learners of foreign languages. It accounts for the phases of learning in a similar way to that of many modern models, separating conscious and unconscious processes (cf. Section 2.3). He even includes a factor which resembles cue validity: when there is a competition between the form previously learnt and the one analogically formed, it is solved by their relative power (Paul 1960, 114). Analogy is also a creative force: it makes no difference for the course of events whether the result already exists in the language or not (Paul 1960, 110).

If Paul said it all, what remains for present-day researchers to discover about analogy? Attempts to model it on computers have produced the need to quantify analogy, exemplified by Skousen's model. A sharper definition of what constitutes analogy is also sought. Raimo Anttila has contributed a great deal to this work, defending analogical processing even when it was not fashionable. According to him, "language is one manifestation of the innate faculty of analogizing, shown clearly by children even before they have acquired language" (Anttila 1989, 105). He sees analogy as one of the iconic aspects of language, and points out, among other things, that classic proportional analogy is only one subtype. Often proportions do not exist, as in contamination, analogic lag, or anticipation (Anttila 1989, 91).

Esa Itkonen defines analogy in the following way: if in a system A B C are in relation R, it is analogical to a system in which H I J are in relation R', where R' resembles R. A B C are related to each other by contiguity or proximity, R and R' by similarity or resemblance. The first is gestalt psychological analogy, the latter abstract analogy. He also points out that similarity and proximity are

the most important links between phenomena. Proximity is here defined as perceivable similarity[11], while abstract analogy is structural (Itkonen 1992, 40–41; see also Itkonen 1991, 62). The latter type of analogy is called associative learning by Rumelhart, Hinton and McClelland (1986, 54–55, see above). Itkonen claims that all learning is based on analogy (1992, 45) and that since analogy is a creative ability, it is not likely to be mechanized. A reason for this is that in a speech situation information can never be totally predicted. (Itkonen 1992, 47.)

Another concept related to analogy is contamination. It seems that a product of an analogical process can be called a contamination if it is not acceptable. The process itself seems to fit well within the limits of analogy. Similarly, transfer is an analogical process between two languages. It is called interference when the outcome is an error (Sajavaara & Lehtonen 1988, 35).

In many models of language learning analogy has received new names. This may be partly due to a desire to emphasize the new aspects of the model, partly to avoid connotations with imprecise usage of analogy in the past. MacWhinney (1975), for instance, considered analogy a slow way to produce forms, preceded by hesitation. Later he defines the gang effect as "a new form of analogy in which a word that is being processed is compared to a larger number of words than in traditional analogy (where it is compared to only a single word)" (Stemberger & MacWhinney 1988, 108). Thus the gang effect is used to replace analogy, which is seen to refer only to proportional analogy. Itkonen (1992, 46), on the other hand, claims that McWhinney and Bates use the term Competition Model to mean analogy.

The distinction between rules and analogy is by no means clear, either. According to Itkonen (1992, 46), Jackendoff uses the term "preference rule system" to mean analogical interpretation. Laalo (1991, 88), in his critique of Skousen's model, points out that rules do not need to be inflexible and strict. Thus rules and analogy can be seen as alternating forces (as in Paunonen 1974, 33–34) or as two ends of one continuum with overlap or a grey area in the middle, as will be suggested in Chapter 8. Even if rules and analogy can be defined as separate entities, linguistic products can result from either processing mechanism. A correct form does not reveal its origins, and an error can be interpreted either as an outcome of analogy or misapplication of rules. This minefield will be stumbled through repeatedly in Chapters 5–7.

In this study analogy is generally seen as a creative force by which learners produce new forms.[12] The process is based on comparisons with similar or adjacent forms. The similarity, however, does not need to be structural in nature — it may also be semantic or even involve transfer from L1. Nor does it need to be real: a perceived similarity has the same analogical force as a real one as long as the perception is not corrected. Thus the learner's inability to distinguish between some phonemic units of Finnish may give rise

[11]Note that in Skousen's model proximity refers to adjoining units, as two phonemes next to each other.

[12]In Chapter 5 a narrower definition of analogy is used, due to the nature of the data.

to analogy. The function of analogy is to make sense of the learner's current IL system and to keep it as cohesive as possible.

The Competition Model

The Competition Model of Bates & MacWhinney (1987, 1989) is presented here because it has been applied to the learning of inflection in morphologically complex languages such as German, Dutch, Italian, Spanish, Japanese, and Hungarian. Thus, it does not solely depend on data from English, which in the light of recent crosslinguistic research has been proven an exotic language in the sense that its speakers rely heavily on sentence processing devices not commonly employed by speakers of other languages (MacWhinney & Bates 1989, xiv). Recently, a newer version of it has also been applied to (simplified) Finnish (Thyme, Ackerman & Elman 1994). The idea of different linguistic alternatives competing with each other is not a new one; it was already presented by Herman Paul (1960, 114).

In his early work on morphological production (1975), MacWhinney studied the relative importance of alternative ways of producing word-forms and concluded that it requires three essential skills: production by rote, by employing rules, and by analogy, in this order of preference. By rote he means that forms are memorized but unanalyzed, by rule that forms are produced by mechanically applying a simple rule, and by analogy that the form is compared to another form. The difference between a rule and an analogy in his terminology is that if the comparison involves several similar items under specific conditions, the processing is rule-based, while analogy involves comparison between two items only. That not all forms are produced by rote is easily shown by the fact that speakers are able to produce forms of nonsense items, which have to be processed either by rules or by analogy. He found little clear evidence for the use of analogy in actual speech processing.

MacWhinney's view of the structure of morphological storage is eclectic: it combines word-by-word memorization, the basic-form-and-rules approach of the IP models, and the analogical organization of WP models. MacWhinney does not state the mechanisms and sources of analogy very explicitly, however, so it is not clear whether his analogy is paradigmatic or not.

Later MacWhinney, together with Bates and several others, developed and refined his ideas by means of extensive testing and crosslinguistic evidence. The result, the Competition Model, is not a formal model of linguistic competence, but of performance. It is not, however, a "performance model" distinct from some other, more formal "competence model". It should rather be thought of as a "processing model", which focuses on the psychological status of language processing (MacWhinney 1987, 301) and on "cross-linguistic variation in the mapping between form and function in language comprehension, production and acquisition" (Bates & MacWhinney 1987, 159). In doing so it combines many of the notions discussed in Sections 2.1.–2.3. Grammatical categories, for instance, are considered to have prototypical members but also to be heterogeneous: a grammatical category can include members which overlap with the prototype but not with each other. They are connected to each other by

family resemblance. Category assignment is the joint product of maximum overlap with the category that is ultimately assigned and minimum overlap with neighbouring categories. (Bates & MacWhinney 1987, 167.) The Competition Model also allows statistical properties of the input to play a major role in determining the order of acquisition as well as the nature of the mature state (Bates & MacWhinney 1987, 157–158).

An important aspect of the Competition Model is its functional basis: it is defined as "a particular instantiation of a general functionalist approach to language performance and language acquisition". Its proponents believe that the "forms of natural languages are created, governed, constrained, acquired, and used in the service of communicative functions" (Bates & MacWhinney 1987, 159–160). Language is seen as consisting of vertical correlations between function and form, horizontal correlations between forms themselves, and horizontal correlations between functions. The mappings that drive the system are the vertical ones, and thus the main attention is on correlations between function and form. A one-to-one relation between forms and functions is not required. (Bates & MacWhinney 1987, 163–165.)

The key concept of the Competition Model is that of *cue*. The winner in the competition between different linguistic possibilities is defined by cue validity and cue strength. Cue validity is the product of cue avalailability times cue reliability. Availability refers to the ratio of the cases in which the cue is available over the total number of the cases in a given task domain. Reliability is the ratio of the cases in which a cue leads to the correct conclusion, over the number of the cases in which it is available. Cue strength is the probability or weight that the organism attaches to a given piece of information relative to some goal. (Bates & MacWhinney 1987, 164–165.)

These factors can be compared with notions presented in many earlier models of language learning, such as frequency of occurrence, regularity, and saliency. The difference is in the degree of specification. They are also quantifiable, thus approaching the connectionist models. Cue cost which consists of perceivability and assignability has fewer ancestors. Perceivability is the extent to which a listener encounters difficulty in trying to detect a cue; assignability refers to the ease with which a given cue can be assigned to a role. (Bates & MacWhinney 1987, 179–180.)

The main limitation of the Competition Model, for the study of the acquisition of Finnish as a second language, is that it was originally created for L1 acquisition. It has been applied to SLA, too, and the results support probabilistic models instead of rule-based models. As Kilborn and Ito note (1989, 262): "At the same time, however, the second language results also look quite different from comparable studies of first language acquisition within the Competition Model, and may suggest some further constraints on the learning component of that model."

For the present purposes it is also a disadvantage that the majority of the applications concern reception. As Bates and Devescovi point out, studying production is more difficult since there are many ways in which the informant can respond, even in a structured experimental setting. The variables become too many. (Bates & Devescovi 1989, 226.) Furthermore, the bulk of the studies

deal with sentence processing. However, the model is in a continual state of evolution, and new applications include SLA, morphology, and production.

A basic problem in language acquisition research is how to account for what is universal, and how to account for what is variable across natural languages and across individuals. Nativist approaches, like the Government and Binding Theory, include implicational universals, a pool of structural possibilities in which each choice carries important structural consequences: if X then Y. Once a parameter is chosen, there is no turning back.[13] This presents the problem of a single specified order and implies that the adult "steady-state" can be modelled in terms of the presence or absence of certain structural types. (Bates & MacWhinney 1987, 157–158.)

A major opponent of the Competition Model is the Learnability Theory presented by Pinker (1984). It is based on the Lexical Functional Grammar, which generates two structures for each well-formed sentence in the langugae: a constituent structure and a functional structure. Pinker (1984, 31) assumes that it is this rule system that the child acquires and that the child knows "prior to acquiring language, the overall structure of the grammar, the formal nature of different sorts of rules it contains, and the primitives from which those rules may be composed". It is thus firmly based on the nativist view of language acquisition.[14]

An interesting feature of Pinker's rule-based theory is that it assumes paradigm representation: "Instead of classifying declensional information solely by appending grammatical features to the lexical entries for each affix (and thus having the affixes serve as indexes to that information), the grammatical information itself can also serve as an indexing system, under which particular affixes are listed. I assume that the adult grammar represents information about affixes in a paradigm or matrix representation" (Pinker 1984, 174). He admits that a fully inflected word can be simply stored in the lexicon. But it is insufficient to have lexical paradigms: as the inflectional system is productive, there must be a general rule schema to derive new forms from the old ones. (Pinker 1984, 176.)

Overall, it seems that at the moment strictly rule-based models are borrowing features from the "softer" models, while some non-rule-based models are becoming formalized in their computer applications. It remains to be seen whether this development will lead into a further multiplicity of theories or models, or into a merger of the present ones.

The ideas of language learning and processing presented in this chapter are utilized in the data analysis of this study, although reference to this chapter will not be provided every time that words such as rule, analogy, connection or

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[13]It has, however, been suggested by Pinker (1987) that parameters themselves can be encoded in probabilistic terms.

[14]Another important nativist theory of language acquisition is the Parameter Setting Theory of Roeper and Williams (1987). Although nativist theories have been a central part of linguistics in the past three decades, they are not further discussed here, as they refer only to L1 acquisition.

competition are used. The relevance of each of these notions is further considered in the concluding discussion (Chapter 8).

2.5 Errors and crosslinguistic influence in morphology

The concepts of error and crosslinguistic influence, or transfer, inevitably occur in any study of learner language. If the language of learners does not differ from the products of native speakers in some way, it is not worth a separate study. The differences must have a name, and one of the most common ones is *error*. In explaining errors, crosslinguistic influence is one potential factor.

Together with *error*, such terms as *inaccuracy, difference, deviation, difficulty* and *problem* have been used in the SLA literature to indicate items which separate learner language from target language (see e.g. Ellis 1985, 30–31). They are not necessarily synonymous, but even when they are used in the same sense, the choice depends on the author's views and preferences. I have previously used *deviation* (*poikkeama* in Finnish, Martin 1989) for errors in the speech of American Finns. In this study I will use the shorter and clearer term *error*.[15] An error here is a feature of an isolated product of a learner, and the use of the term does not reflect any evaluation or judgement of his/her language skills. Deviation, to a greater extent than error, inherently involves the presence of a norm or a line of development with which the performance is compared. The terms difference, difficulty and problem, as well as inaccuracy, are needed for other purposes.

Error is often used to refer to competence, *slip* (or yet another alternative, *mistake*) to performance. Children and learners are said to commit errors, whereas competent native speakers produce slips which they are supposed to be able to correct themselves. This distinction is only maintained in this study for ease of discussion in the comparison of the test results of learners and native speakers. Theoretically, it is not at all clear that the morphological errors/slips of learners, children and native adult speakers would be inherently and qualitatively different, as will be seen from many examples in this study, and as is also argued by Dufva (1992, 41–50).

For errors to exist there must be a norm by which they are recognized. In studies of exceptional language forms (as listed in Chapter 1) it is very often the standardized form of a language which is established as the norm. This has been the case even when standardized language has not been available to the speaker, as in studies by psychologists where dialectal forms used by children are considered errors.[16] This is hard to justify: what else could a three-year-old possibly speak but the dialect of her/his parents and peers? The question of

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[15]Many SLA researchers automatically connect the term *error* with a research paradigm called Error Analysis. This, however, is not the intention here.

[16]For an example, see Lyytinen 1978, 26, 52, 66.

linguistic norms and their influence on research paradigms has already been discussed in Chapter 1.

The theoretical problems posed by attempts to define an error are considerable: the standard language does not include all the variation allowed for native speakers. The limits of usage of native speakers are not known. How can anything then be defined as deviation from it? The acceptability of learners' productions can be tested on a group of Finns, but this only alleviates the problem, as it does not guarantee that the Finns would never produce the forms they reject in the test. Even a strictly language-internal definition of an error does not work in this sense: learners and Finns alike sometimes produce forms which violate the phonotactic sequencing rules of Finnish. This in turn raises the question of the psychological reality of such rules.

In practice the only possibility is to trust one's own intuition and that of some fellow researchers who are acquainted with the data: anything that looks like a morphological error has been isolated for further examination. The advantage of this procedure is that it reflects reality. Those errors which identify a foreigner's speech as deviant and potentially hamper communication are likely to be included, while those which pass unnoticed are not.

The term *correct* is generally used in this study rather loosely to refer to a form which native speakers would normally use in the same context. It does not mean that it is the only possible form, nor does it indicate any "official" standard. For nonce words in Chapter 5 it has the very narrow definition of a form being modelled directly on the corresponding real word-form.

In linguistics, errors are traditionally classified according to linguistic levels (morphological, phonetic, etc.). This is related to the modularity hypothesis of language production. In psychology, explanations for linguistic errors have been more holistic. Recently, in linguistics, the levels of language have also been seen as influencing each other, and explanatory evidence is also sought outside the language system (Dell 1992, 138; see also Dufva 1992, 16–21). The latter framework is the one adopted here: only morphological errors are included, but explanations are sought from many sources.

Besides the traditional linguistic levels, other classification criteria have been suggested: speech vs. writing, production vs. perception, omission vs. addition, paradigmatic vs. syntagmatic, rare vs. frequent occurrence, intrinsic vs. extrinsic similarity constraints on the interchanging units (see e.g. Zwicky 1982, 117–123; Shattuck-Hufnagel 1982). Classification parameters could also include the severity or importance of the error (marginal or unimportant vs. central or serious), which become crucial when the focus of the study is on interaction.[17] In this study classification is an aid, not the aim, and consequently only two principles have been applied: the study is limited to production errors that

[17]In this study, the interactional aspects of learner communication play almost no role. Inflectional errors rarely prevent interaction, although they may hamper it to some extent (see Suni 1995). This is not to say that interaction and morphology have no connection; after all, inflection exists for the purposes of communication. However, these aspects of learner behaviour are studied by other members of the project *Finnish as a Second or Foreign Language* (see Preface).

appear to have something to do with morphology, and the examples are classified for the maximal ease of presentation.

Failures or errors in the production of linguistic items can depend on one of the memory faculties (intake, storage or retrieval), while successes and correct forms require a sufficiently good functioning of all the parties to the production process. This is one of the reasons why errors are used as evidence in studies of language production: they provide an opportunity to pinpoint the phase at which the problem arises. A variable error, for instance, must be conceived in retrieval, since the same form is sometimes produced correctly and cannot therefore reflect a problem at the intake or storage phase.

A learner's error may be due to an intake problem. The input may be erroneous, as in the case of learners talking to each other, although erroneous input does not necessarily increase the number of errors in production (Wesche 1994, 237). Even when the input is correct, the intake may be faulty: an item can be misheard or incompletely heard due to noise, or it can be misread due to inattention or lack of reading experience. It can be taken as another item, due to an inability to distinguish between sounds or letters of the language to be learned. L1 may interfere when the input is analyzed, or the analysis may fail or be incomplete due to lack of experience of analyzing the L2 forms.

A learner's error may also be due to a storage problem. For the purposes of this study, an item is correctly stored if it is stored as the items of the same kind are generally stored. As the memory is not the focus here, it is not essential to define the functioning of the storage more precisely. During storage, the item may be lost or changed. It is not relevant here whether the loss of an item is real or perceived, permanent or temporary. If an item is not available for production when needed, it makes little difference whether it is totally gone from the storage, too faded so that it is irretrievable, or just buried too deep.

An item could also be imagined to undergo change while in storage. Apart from fading, it is hard to picture how this could happen without interference from new material. It is conceivable, however, that a non-target-like item could be considered correct by a learner and used without such feedback from interlocutors, which would make the learner focus on the error. In the long run, however, the learner would store new items of the same kind, target-like this time, and eventually revitalize the old erroneous item analogously to the new ones.

Finally, a learner's error may be due to a production problem. The causes of errors in production are explored throughout this study as the data are presented, analyzed and discussed.

In the learning process, errors are to be expected. In teaching, all the details of a complex system cannot be included in one lesson, and students, unaware of exceptions in the system, produce erroneous forms. In spontaneous acquisition errors are to be expected when the data are not yet sufficient for a comprehensive analysis. The situations are essentially the same, differing only

by the setting in which the input is received.[18] Errors are an important part of the concept of interlanguage (IL): learners test their assumptions, which are based on the language (and instruction about the language) they have received, by producing forms which fit the rules of their current IL grammar and may or may not be target-like.

Erring in this sense is the other side of the learning ability of all organisms: "Only those with the ability to learn, can err" (Dufva 1992, 51). This makes some errors inevitable, even desirable. In the analysis of learner language it is not possible to know in advance which deviant-looking forms turn out to be learning-enchancing, which are temporary mix-ups and not worthy of further attention, and which are potential fossilizations to be shed.

One direction in the search for explanations for errors in SLA is the influence of L1, often referred to as transfer. In an SLA situation crosslinguistic influence is inevitable: "Whenever a speaker-hearer has recourse to several languages, those languages are bound to interact in his or her message-processing system under the influence of a set of factors whose true nature for the most part still remains unknown" (Sajavaara & Lehtonen 1988, 35).

In the behaviourist paradigm, transfer was usually equated with interference, caused by the established habits of L1 and leading to errors. This view led to error analysis, which for a while was an important area of SLA research, and which in turn was abandoned in favour of more positive approaches towards learner output. In the cognitivist paradigm transfer is seen as a problem-solving procedure, or strategy, by which L1 is utilized to solve problems in L2 learning or communication (Faerch & Kasper 1986, 49). To avoid the potentially negative connotations of the word transfer, the term *crosslinguistic influence* is now often used.

The terms *positive* and *negative transfer* can be specified, as Sajavaara and Lehtonen (1988, 35) have done, as the positive or negative "*outcome* of cross-language influence, depending on whether the interacting languages are congruent or not in terms of the category in question". In this view the process of transfer itself is neutral, while the outcome may be an added area of ability in the target language as well as an error. In a similar vein, Sharwood Smith (1982) calls negative transfer *interference* and positive transfer *facilitation*.

Faerch and Kasper (1986) discuss the cognitive dimensions of crosslinguistic influence in speech production. The distinction between declarative and procedural knowledge is essential for their view of transfer. Speech production is seen in terms of a striving for communicative goals at the levels of proposition, illocution and modality. Transfer enters in the planning phase involved in the attempt to achieve these goals. Thus transfer may occur

[18]For a recent account of the role of input and interaction in second language acquisition see Wesche (1994).

at the level of making the decision about the need to say something.[19] Crosslinguistic influence may also affect the degree of implicitness, as well as the ways the initial proposition is expressed, particularly as linguistic problems arise in executing the plan.

Two aspects of procedural knowledge, which Faerch and Kasper (1986) use in classifying different kinds of transfer, are attention and automatization. Attention may be focal or subsidiary, and automatization involves the frequency of use of the item in question and the complexity of the required compilation process. In strategic transfer the learner's focal attention is directed towards a planning problem and its solution, resulting in the use of "foreignized" L1 items or literal translation. In automatic transfer, automatized sub-routines of declarative knowledge are activated while attention is focused on something else. An example of this is the use of L1 (or Ln) conjunctions in L2 speech.

Neither attention nor automatization are dichotomous concepts. The third type of transfer, subsidiary transfer, refers to a variety of cases along these continua. It differs from strategic transfer in that attention is not focused on the production problem at the time of planning, but may focus on it post-execution, as a result of monitoring. "An essential aspect of subsidiary transfer is therefore what types of L1 declarative linguistic knowledge become activated and how this knowledge interacts with IL knowledge" (Faerch & Kasper 1986, 60).

Opinions on the importance of crosslinguistic influence in morphology differ a great deal. In a research framework where learners start the acquisition process from L1, and proceed by testing which parts of it can be used in L2, transfer is obviously a key concept. However, unless the L1 is morphologically very similar to the L2 (e.g. as Estonian is to Finnish), this approach is not likely to produce immediate results. Compared with Finnish, the L1 morphology of most learners is simply too different. Thus, the only examples of learner products in which direct morphological crosslinguistic influence can be easily seen are from Estonian speakers.[20]

In their 1986 article Faerch and Kasper suggest that subsidiary transfer occurs at all linguistic levels. They have no convincing examples of inflectional morphology, however. Later they revise their IL hypothesis. They state that a separate IL representation may be more adequate for learners whose L1 differs widely from the L2 than in situations where the learner's L1 and L2 are closely related and one-system processing may be more widely utilized. They also admit that the IL hypothesis may be more relevant for some levels than some others, e.g. morphology. (Faerch & Kasper 1988, 191.)

This view is reinforced by the opinions of many teachers of Finnish as a second language, who claim offhand that there is no transfer (or interference) from the L1 (except for Estonian or Carelian, etc.). This reflects the underlying notions that transfer is something negative and that it can be seen in the

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[19]An example of this would be the need that many Americans feel in Finnish discourse to say something to occupy the space of leave-taking phrases like *have a nice day* or *take care*, while Finns often depart with a mere greeting.

[20]Among the informants in this study there is only one Estonian.

product, like English suffixes tagged onto Finnish stems. In morphology, however, it is hard to pinpoint crosslinguistic influence as a cause of deviant outcomes. Direct transfer requires some kind of contact points between the systems: if the two systems have nothing in common, there is no route available for the transfer process.

Although word-internal inflectional influence is limited to closely related languages,[21] morphological transfer can be seen on a different level. Speakers of a language like English, in which there is often no formal distinction between parts of speech — nouns can be used as verbs or adjectives, etc. — sometimes extend this feature to Finnish as well, attempting, for instance, to attach verb endings to a noun stem. Also, if a grammatical notion, such as aspect or definiteness, which is not usually morphologically coded in Finnish, is morphological in the L1, learners may search for inflectional devices for its expression. This type of transfer could be called functional.

Another problem for crosslinguistic research is to account for the difference between the results of transfer and the results of (quasi-)universal information. Most learners of Finnish have categories such as noun, verb, adjective, pronoun, or number in their L1. They also know that plurality and time are expressed somehow. If they use this information in Finnish, is it crosslinguistic influence?

Neither should transfer in reception and transfer in production be equated. Features common to languages such as those listed above may aid in reception, at least as predictors of what might be expressed by morphological devices. They are of no help in production, where ideas have to be given a concrete form. All in all, "what is reflected at the surface as items transferred from one language to another may actually be due to several different phenomena which relate to the processing of linguistic and non-automatic processes, gaps in the information stored in memory, various types of formal or message reduction, – – and the effects of language teaching" (Sajavaara 1986, 67).

As the role of crosslinguistic influence in morphology is minor and usually indirect, it has not been considered necessary to limit this study to the speakers of any one language. The effects of a learner's mother tongue are discussed when necessary, but generally the variety of L1s is not seen as a problem but as a rich data source.

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[21]A morpheme-order error of the type *vaimonille* (see 7.2.2) could be a product of crosslinguistic influence. The only other examples, to my knowledge, where word-internal patterns of L1 could be seen as transferred to words of L2 are from American Finnish, of the type *laisin* : *laisimen* (< *licence*). Similar forms can be found in Finnish dialects (*Austin* : *Austimen* 'a make of cars'). However, such examples are established loans, comparable to items of the L1, and thus not examples of transfer.

3 MORPHOLOGICAL MODELS AND FINNISH MORPHOLOGY

The position and scope of morphology within linguistics is a function of time, place and aim. Between the philosophers and grammar-writers of the ancient cultures of India, Egypt, Greece or Rome and today's computer-assisted linguists there is plenty of space for variance in views and opinions. However, not only have the trends of each historical period influenced grammarians, but also their environment: the language(s) spoken by a scholar have undoubtedly shaped his views as well. At times this has been seen as a weakness — grammar should ultimately be universal — while other trends have allowed different theories for different languages. Furthermore, in addition to time and the cultural and linguistic context, the purpose of grammar-writing — e.g. theory building, mother tongue teaching, foreign language teaching, translating, etc. — has also influenced the status of morphology. In this chapter, some general models of morphology will first be considered, followed by specific descriptions of Finnish.

3.1 General morphological models

Theory or model?

One of the basic questions is: What should presentations of morphology be called? Grammars? Theories? Models? Descriptions? The question becomes even more complex when the learning dimension is involved and presentations of morphology are viewed with solutions to language acquisition problems in mind.

The use of the above concepts in the field of language acquisition has been discussed in Roeper (1987, 309–310). He defines grammar as "a set of principles"

and language "includes the interaction of principles with many other aspects of mind". Theory is

> a set of deductive principles that state the relationship between innate knowledge and a representative sample of input sentences from any human language. The generative power in language ability comes from combining a set of inputs with grammatical principles. A theory has only principles in it. A theory may or may not be successful.

Language learning, however, involves countless factors outside the deductive principles, also known as rules, which are extremely difficult if not impossible to squeeze within the severe limits of theory. An argument for the more humble *model* is presented by Bates and MacWhinney (1987, 174), who refer to psychology, but actually apply their framework to language acquisition:

> A theory is a set of inter-related hypotheses that can be directly tested and rejected by some line of evidence. – – A model has much less internal coherence, insofar as it reflects an open-ended or 'bottom-up' attempt in the strict sense; it can only be confirmed or disconfirmed in pieces. – – When a model undergoes too many *ex post facto* repair attempts, it finally becomes a patchwork of assumptions that has no architectural center – – the model collapses.

The choice of the term reflects the view adopted toward language: language seen as a formal system has a theory, while language as a means of human interaction is presented in the form of models.

The word *model* is used in this study to denote all those presentations which explicitly aim at some level of generality, be their starting point that of "pure" linguistics or that of SLA. This is also the term used by Hockett (1954) in his seminal article on morphological models. The term *model* does not exclude, however, the use of the word *theory* and its derivations in its other senses, particularly as the opposite or counterpart of practice. *Description* is then left to refer to a specific account of a certain language and, in traditional manner, *grammar* refers to presentations which include other areas or levels of language besides morphology.

WP, IA and IP

The immense variety and often cyclical developments within morphology have been condensed in the classic article by Hockett (1954) into a more limited set of morphological models: the Word and Paradigm model (WP), the Item and Arrangement model (IA), and the Item and Process model (IP).[22]

By a "model of grammatical description" Hockett means "a frame of reference within which an analyst approaches the grammatical phase of a language and states the results of his investigations" (p. 210). He claims that

[22]It is worth noting that although Hockett's terminology is usually seen in the domain of morphology, he does not (at least explicitly) limit his discussion to morphology, but considers the classification as a general one applying to all levels of grammar.

although each grammatical description could be called a model, they can be seen to cluster within certain archetypal frames of reference. Of these Hockett seems to favour the WP model, even though it is only briefly discussed on the first page. The remainder of the article is devoted to a comparison of the IA and IP models.

In a simplified way one can say that the essence of the IP model is that the differences between partially similar forms are expressed as processes in which one form yields another. In the IA model no processes exist, only items (morphemes) and their arrangements relative to each other. Thus, the abstract level of the same set of surface forms consists of lists of basic forms and rules in an IP model, and of lists of morphemes and their possible arrangements in an IA model, with the addition of statements about the phonemic shapes (allomorphs) of the morphemes.

The IP approach is older than the IA one. A good part of Neogrammarian work was of the IP type, although features of the classical tradition of the WP approach also remained. After a half century of American Structuralism, within which the IA model was created, the IP model surfaced again during the peak of the Generativist period of the 1960s and 1970s.

The properties of the IA and IP models and the concepts employed by their creators and users will not be discussed here in detail, partly because they are familiar to readers with a basic knowledge of the linguistics of this century, partly because neither model as such is used to account for the data of this study. However, some of the major arguments of both sides, which have a bearing on the latter parts of this study, are briefly presented below.

One of the major problems in the IP model is the choice of the basic form. The process must have a starting point. The supporters of the IA model considered this priority of one form over others an arbitrary decision which should not be made, and later the issue has been discussed extensively within the generativist framework (for Finnish, see e.g. Campbell 1975; in this study the basic form question is approached in Section 3.2.3). Similarly, in the IA model the central problem is the choice of the items, i.e. what constitutes a morpheme. The position of zero morphs and discontinuous morphs in particular has created a great deal of discussion.

In its purest form IA allows only two kinds of item: morphemes and sequences of morphemes. In addition, there are concepts like order, construction, and hierarchical structure. In some forms of IA some morphemes are considered markers of constructions. This, however, brings back the problem of some units of phonemic material being given a different status from others.

A criterion often used in the evaluation of competing models of grammar is economy. Hockett (1954, 231) remarks that this question was never evoked within IA as far as the number of morphemes was considered. On the other hand, it is considered very important for the classification of morphemes: the number of types has to be as small as possible. In IP, singular processes have to be listed together with those concerning thousands of cases, unless some kind of classification of processes into types is postulated. This suggestion of Hockett's (1954, 232) was carried out by the generativists, for whom the

economy of a model is of great importance, in the postulation of deep structure forms and rules.

Another point of criticism against the IP model is that linguists working within this framework often phrase their statements as if language were alive and had a mind of its own: for example, it "employs" or "exploits" certain techniques (Hockett 1954, 211). The IA defence of this is extreme formalism. But formalization can also lead into what Hockett (1954, 223) calls "the most embarrassing tactical trouble inherent in IA: machinery which has to be in our workshop for use in certain marginal cases tends to obtrude itself where it isn't wanted." Furthermore, Hockett points out that IP can also be formalized.

TG and morphology

The formalization of grammar was later carried much further by the generativists, but in many of their grammars there was no place for morphology at all. Questions of both inflectional and derivational morphology were discussed under either syntax or phonology. This approach was partly due to the strong influence of the English language, where the role of inflectional morphology in particular is minor (F. Karlsson 1973, 76). However, the independence of morphology has always been defended (e.g. Matthews 1974 and Kiefer 1970). Several linguists working with Finnish (Paunonen, Skousen, Anttila and T. Itkonen, for example) also argued for an independent status for morphology, either explicitly or implicitly. Nevertheless, "morphology was something of a stepchild of linguistics" (Hammond & Noonan 1988, xiii).

Within the generative paradigm it became apparent by the early 1970s that the transformational approach to word formation was misguided (Hammond & Noonan 1988, 4). The first comprehensive model of word formation within the generative paradigm was published by Aronoff in 1976. Other important attempts to include morphology in generative theory, either in relation to phonology or to syntax, were Lexical Phonology (Kiparsky 1982, Mohanan 1986) and Extended Word Paradigm (S. Anderson 1977, 1982, 1988). These theories share a fundamentally rationalist approach to science, allowing no historical or experimental data, and are clearly nonfunctionalist in their orientation (Hammond & Noonan 1988, 17).

A concern for the naturalness and psychological reality of grammar brought forth new approaches, particularly in Europe. The most important of these "natural generative grammars" are those by Mayerthaler (1980) and Dressler (1985), who introduced the question of the semiotic appropriateness of different morphological processes to different morphological functions. These theories are based on a functionalist approach and are empirically oriented, with experimental evidence in a central position (Hammond & Noonan 1988, 17).

Regardless of the research paradigm or theoretical framework, grammarians dealing with English tend to lean towards derivational morphology, while inflectional morphology has received much less attention. This is natural, since the English language has very little in the way of inflection, and derivation has provided many more interesting problems for study.

Eclectic Matthews

Even during the heyday of the TG research paradigm there were individual grammarians who focused on morphology. Matthews (1974) came to its defence in his textbook *Morphology*, whose subtitle "An introduction to the theory of word-structure" effectively delimited the scope of morphology. Matthews considered the theoretical arguments for and against each of the models presented by Hockett, although he was quite clear about his partiality for the then long-neglected WP model. He also offered extensive illustration and evidence from a variety of languages. In general, it seems that it has been the theoretical linguists with little practical experience with languages other than English who have been the most eager to do away with morphology.

Matthews (1974, 6–7) listed some of the arguments the generativists had presented against an independent grammatical level called morphology. The most important was that there is no theoretical need for a distinction between phrase level and word level statements. Furthermore, all languages do not have words, and a grammar with a morphology could therefore not be universal. Matthews's counterarguments were less theoretical: the intuitive knowledge of most people maintains that languages are built of words. Moreover, studies of many different languages customarily have large sections on morphology. Matthews (1974, 8, 16) considered this kind of arguments valid, because "the theory of grammar should not become divorced from the exigencies of ordinary description" or, in other words, "the study of morphology is important because it is there".

Matthews also presented theoretical arguments for the relative merits of each of Hockett's models. His views are relevant and consequential in this study because he respected the viewpoint of language learning, bringing evidence not only from native speakers but also from learners and teaching practices.

According to Matthews (1974, 67), in the WP model "the word is its central unit, and the grammatical words are the minimal elements in the study of syntax. At the same time, the intersecting categories form a framework or matrix within which the paradigm of a lexeme may be set out." In this context Matthews also stated his view of learning: "In learning a new language we are often obliged to learn these various differences by rote. Since we usually succeed it may not greatly matter, from the practical viewpoint, WHAT precisely a theoretician of language will say that we have learned. But there are obviously descriptive generalizations to be made." Since learners make generalizations, regardless of how they are taught, Matthews concluded: "To capture them we need a model by which we can study the parts of word-forms, in addition to (or instead of, some theorists would say) a model by which we classify words as wholes."

The central process in the WP model is analogy, although in traditional studies it was often left implicit, while learning explicit rules played a more substantial role (Matthews 1974, 68–69). Another central feature of WP is that morphemes "are not sequentially organized but are properties of each word as a whole" (Matthews 1974, 144).

The accumulation and interaction of several inflectional items within one word is often encountered in learning Finnish morphology. Matthews discussed this in several contexts. In the WP framework he used the term *exponent*, which was defined as "features which identify a morphosyntactic property". He divided these phenomena into cumulative exponence (combination of items without internal changes), fused exponence, which results from assimilation and similar processes, overlapping exponence, in which one item stands for more than one exponent, and extended exponence, where the same exponent is in more than one position within a word (Matthews 1974, 144–150). In his discussion of leading forms (Matthews 1974, 72–73) he also implicitly approached the question of whether words with multiple inflectional items should all be derived from the root/leading form or as a chain from one to another. This question will be revisited in Chapter 9.

In accordance with his eclectic and practical view of morphology Matthews considered the IP model useful for English but rejected it for Latin (p. 120). He considered the WP model appropriate for Greek and Latin, among others, but remarked that these languages also tend to require "at least a partial process treatment" (Matthews 1974, 145). He also stated: "We should begin to ask whether it is right to or necessary to apply the same theoretical model to every type of language" (Matthews 1974, 123).

The return of the paradigm

The concept of paradigm, together with noun declensions and verb conjugations, was assigned a very marginal status in the generativist era until interest in it surfaced again in the 1980s, particularly in the works of Wurzel (1984) and Carstairs (1983, 1988). Since this question is important for this study, this aspect of Carstairs work is brought up here, unlike most other theoretical morphological models based on the generative framework.

Carstairs introduced the concept of paradigm economy, which addresses the question of whether there is any constraint on the number of distinct inflectional paradigms into which the inflectional resources of a language may be organized. The minimum in a language which has any inflectional alternation at all is two, and the maximum can be mathematically calculated. According to Carstairs, it is possible also to predict the actual number, not only the mathematical one. His Paradigm Economy Principle states that the inflectional resources of a language must be organized into as few paradigms as is possible to put all the inflections to work. (Carstairs 1988, 73.) This principle is, of course, in accordance with the principle of maximal economy, which is used in the evaluation of theories or models.

Although Carstairs (1988, 75) may have good theoretical grounds in arguing that only affixal inflections should be allowed their own paradigms and that non-affixal (non-concatenative) inflection is not sufficient ground for setting up a distinct paradigm, his solution is not viable for Finnish, certainly not for a learner of Finnish. His concept of what constitutes an inflectional paradigm is too abstract for practical applications in a language in which stem changes are quite widespread.

Carstairs (1988, 77) states, as an answer to potential counterarguments, that "the fact that two words which are the same for paradigm-economy purposes may be different for other morphological purposes is no embarrassment; it simply illustrates the increasingly evident variety of distinct organizational principles and constraints of a purely morphological kind to which inflection is subject". He considers the paradigm-economy constraint necessary to counter the assumption that "inflectional morphology is just a hodgepodge of language-particular idiosyncrasies". It is questionable, however, how the overall economy of a morphological model is served by limiting the number of paradigms in the extreme if, as a result, it is necessary to introduce other "distinct organizational principles" to cover what a given language actually entails.

Another paradigm-based morphological theory is presented by Stump. He finds evidence for assuming that regularly inflected forms are generally not lexically listed (Stump 1991, 680). He extends the concept of paradigm to both inflectional and derivational morphology, stating that in both areas there is a basic member or root. In "the domain of morphosemantics, the null hypothesis is that morphological structure is simply isomorphic to logical structure. Paradigm functions make it possible for a word's structure to stray from these expected relations, and in this way they provide the means to resolve a wide variety of morphosemantic mismatches." (Stump 1991, 722.)

Like *analogy* in the previous chapter, *paradigm* also seems to be an elastic concept, the exact meaning of which it is not easy to pin down. Anttila (1974, 331) talks about paradigmatic weave as an inevitable starting point for both the linguist and the learner, and states that the question is not what linguists want to believe but how much the language user depends on the horizontal or vertical axes. In Finnish morphological thinking the paradigm has always held a strong position, as will be seen in Section 3.2.

Schematic Bybee

In the 1980s several scholars started to formulate morphological models which were no longer based either on the original transformationalist ideas or on their more or less revised successors, which see language as an autonomous system. The most important one for the purposes of this study is the one presented by Joan L. Bybee. It has a functional base, employs evidence from language acquisition, and addresses questions of inflection, not only word formation.

Bybee (1988, 119) sees morphology as lexical organization. While most morphological models have focused on the rules, and representations have only been seen as feeding into the rules, she focuses on the lexicon and considers rules as generalizations that arise from representations. Representations are the contents of morphology: static, fixed, individual and idiosyncratic. Rules are the dynamic parts, the general statements which range over representations. Many types of rules exist and they differ in their freedom of application.

Bybee's model (1988, 125) does not have a lexicon and a morphological component as separate parts of the grammar. The model only has a lexicon: morphological facts are described in terms of mechanisms necessary for storage. These are the ability to form networks among stored elements of knowledge (i.e.

lexical connections) and the ability to register the frequency of individual items and patterns (i.e. *lexical strength*).

Lexical words (or stored items, which can actually be larger or smaller than words) are pairings of sets of semantic features with sets of phonological features. Lexical connections are relations between words, set up according to shared features. Segments of words, such as grammatical morphemes, are seen as one kind of shared feature. Thus *cats* is connected both with *cat* and other plurals. "The word is not physically dismembered, but its parts are nonetheless identified" (Bybee 1988, 127). The advantages of this approach to segmentation are that it uses mechanisms necessary for other linguistic and cognitive functions and that it allows the description of morphological relations in a gradient fashion. (Bybee 1988, 125–128.)

The degree of relatedness between words is determined by the number of phonological and semantic connections. The concept is needed because it has been experimentally shown that speakers can consistently rank pairs of words for semantic and phonological relatedness and that recognition of words can be speeded up by priming with closely related words, more than by distantly related words. Among inflectional phenomena there are those which affect the meaning of the whole word more than others, e.g. aspect or tense affect the meaning more than person. Bybee claims that the more closely related two forms are semantically, the more similar they are phonologically. (Bybee 1988, 129–130.)

There are different degrees of relatedness among the forms of a paradigm, depending on the semantic relatedness (Bybee 1988, 122). This notion — that not all forms are in equal relationship to other forms of the same paradigm — is often intuitively recognized in the way material is organized for the students, but the actual relationships among the various paradigmatic forms of Finnish nouns have not been investigated.

A theoretical construct which distinguishes Bybee's model from earlier ones is lexical strength. The lexicon is not a dictionary, as pictured earlier: not all forms have the same status in it. The influence of frequency of use for access to words can be experimentally shown. Frequently used forms accumulate lexical strength, while seldom used ones lose it. The notion of lexical strength is needed to account for the maintenance of irregularity and suppletion in paradigms, which is something that models with a one-to-one mapping between semantic features and affixes cannot account for. (Bybee 1988, 131–132.)

One of the key concepts of Bybee's morphological model is that of schema. Schemas are product-oriented; products form a schema, not the starting points (Bybee & Moder 1983, 263). Morphological rules do not have a representation which is independent of the lexical items to which they apply. Rather, they are highly reinforced representational patterns, i.e. schemas. (Bybee & Slobin 1982, Bybee & Moder 1983, Bybee 1988). A schema is an abstraction from lexical forms which share semantic properties. The schema resembles a prototype and works on the basis of family resemblance, rather than categorically. The features

of a schema are probabilistic, not categorical.[23] Even a regular behaviour can be seen as a schema, the probability of which is extremely high.

Bybee's schemas are not located outside the lexicon, but are tied to the forms from which they arise. The tie is clearer for some schemas than others; in particular, those schemas which apply to a small number of words are closely tied with those words. (Bybee 1988, 135.) Token frequency and type frequency affect the productivity of schemas in different ways: high type frequency will strengthen the schema, while high token frequency has little effect on it. This is because very frequent forms tend to be accessed without forming connections to other items. (Bybee 1988, 138.)

Bybee's morphology and the connectionists' ideas of cognitive processing share many features. They have also been applied to the same material: the irregular verbs of English. Bybee notes that Rumelhart and McClelland's pattern associator — given a fairly realistic input in terms of frequencies of regular and irregular verbs — shows the same U-shaped behaviour in learning irregular verbs which has been found in studies of L1 acquisition. It does not only learn to produce regular past tenses and the irregular ones given in the input, but it also learns subregularities among the irregular verbs. (Bybee 1988, 136–137; Rumelhart & McClelland 1987.)

Criteria for the choice of a model

As Hockett points out (1954, 232), apart from considerations of economy and aesthetics, the value of a model depends on its use. He sets out, however, criteria for scientific grammars (generality, specificity, inclusiveness, productivity and efficiency) which have often been applied by grammarians. He also concludes that no existing version of either IA or IP meets these criteria. The same can surely be said of the current models of morphology: none is perfect. The major problem is that the most general, efficient and productive models tend to become so complex that they seem intuitively impossible for human consumption. The models which best seem to account for all the specific variations present in natural language, on the other hand, are often incomplete and can only be proven to work in part.

There is also the question of whether morphology needs to be described within the same theoretical framework as phonology or syntax. Can theories be different on different levels? The early TG-grammarians demanded unity, but lately more leeway has been allowed. Aronoff (1976, 1), for instance, states that "a theory of morphology must be integrated or at least integrable into a fairly specific general theory of language. As a subsystem and a subtheory, morphology may have its own peculiarities; a system can be unified without being completely uniform". On the other hand, scholars concentrating on morphology have often built their theory on morphological data and behaviour, with little heed for syntax, for instance. Furthermore, does morphology need to

[23]In this repect, as well as many others, Bybee's schemas have similarities with Lakoff's work on categories (see 2.1).

be internally uniform in nature? This question seems to divide models: there are those who believe in one kind of processing only, be it rules, paradigmatic analogy or schemas, but also those, like Matthews and MacWhinney, who suggest that even within one language many ways of storage and processing may be used.[24]

The development of morphological theory — like theoretical evolution in many fields — seems cyclical. Many basic ideas become central, then fade to the background and appear again rejuvenated. Currently, at least some of the rejuvenation comes from the study of cognition, making morphological models better applicable to questions of language acquisition, since the ability to learn is an important part of human cognition. Like linguistics in general, morphology has also benefited from the application of computers, which has made the use of extensive data and many types of simulation and modelling possible. Hopefully research on SLA will also eventually contribute to the development of morphological models.

3.2 Finnish morphology

Some terminology related to Finnish morphology is introduced in Section 3.2.1, for the benefit of readers unfamiliar with the Finnish grammatical tradition. In 3.2.2 some descriptions of Finnish morphology are summarized. The parts of the Finnish nominal inflection system which are necessary for understanding the data analysis in Chapters 5–7 are described in 3.2.3. The frequencies of certain grammatical items are also presented here. Some inflectional details are explained as they occur, particularly in Section 5.5 and Chapter 7.

3.2.1 Basic terms of Finnish morphology

Since most research on the Finnish language has been written in Finnish, it is necessary to outline which English counterparts of the terms have been chosen for use in this study. The following list of terms is offered for this purpose only, and should not at this point be taken as representing any theoretical stance. The English translation equivalents are those proposed in the list compiled by Hakulinen and Ojanen (1976), where these are applicable; others have been chosen by the author. The usages in Chesterman's translation of F. Karlsson's *Finnish grammar* (1983a) have also been consulted.

Some terminological choices have been made with the Finnish reader in mind, such as the use of *type* instead of *class*, and *quantitative* and *qualitative consonant gradation*. Other terms could be used in English, but since the Finnish equivalents of these are customary in the Finnish literature and therefore familiar to most readers, they are used here.

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[24]This view has also been adapted by Lindgren (1990) for explaining diachronic developments.

Finnish words can be divided into three inflectional categories:

(1) Nouns, adjectives, numbers and pronouns, which are all declined, usually along similar lines, although there are forms typical of only one of these groups;

(2) Verbs, which are conjugated; and

(3) Particles, which are generally uninflected, although some have a partial declension.

Words which in English are called *common* and *proper nouns* are referred to as *substantiivi* in Finnish, while all the words in the first category have the general title of *nomini*. Both are often translated by the term *noun* in English. In Karlsson (1983a) the term *nominal* is employed for *nomini*. This practice is followed here as well, as it makes clear the difference between the main category and the subcategory.

Consonant gradation (astevaihtelu) involves the plosives */k, p, t/*. If a word is subject to consonant gradation, certain forms of the paradigm have what is called the *strong grade* of the plosive, while others have the *weak grade*. The gradation affects the stem of the word; historically it has also affected some affixes. The gradation may be *quantitative* (i.e. the alternation affects the length of the plosive) or *qualitative* (i.e. the alternation affects the quality of the plosive, even changing it into a non-plosive).

Vowel harmony refers to the phonotactic feature of Finnish which prohibits */a, o, u/* from co-occurring with */ä, ö, y/* in simple words. */e, i/* can be combined with either group, although stems with no other vowels but */e/* and/or */i/* tend to be combined with the */ä, ö, y/* variants of endings. If an item has two alternant forms due to vowel harmony rules, the vowels are marked with capitals (*A = a/ä, O = o/ö, U = u/y*). Consonant gradation and vowel harmony, as well as their position in Finnish morphology, are further discussed in 3.2.3.

The *stem (vartalo)* is what remains of a word when inflectional affixes have been removed. Derivational affixes are here considered parts of the stem because derivational morphology is excluded from the present study. A *consonant stem* is a stem which ends in a consonant. A *vowel stem* is a stem which ends in a vowel. Words subject to consonant gradation also have *strong* and *weak stems*, depending on which grade of the alternating consonant occurs in the stem in question. A *closed syllable (umpitavu)* ends in a consonant. An *open syllable (avotavu)* ends in a vowel.

The *base* (or *basic form, perusmuoto*) is the form from which other forms are made (by using rules or other devices). (See 3.2.3. for further discussion).

Type (*noun type, inflectional type, declensional*[25] *type, taivutustyyppi*) refers to the class or category to which a word belongs if words are divided into subgroups for purposes of describing inflection. The number of types, as well as the criteria for this classification, depends on the grammatical model, although some kind of classification into types is present in all models of Finnish inflection.

Word-types are usually referred to by sample words. Thus descriptions of Finnish often talk about the *risti*-type or the *ajatus*-type. This naturally assumes good knowledge of Finnish since there is not always any independent way of knowing how these words are inflected, although a great number of words can be assigned to types on the basis of the phonological form alone. This practice is also used in this study, but, when there is any danger of confusion, an inflected form is given in brackets or the stem changes are indicated (for instance *-s:-kse-*). When several word-types sharing similar characteristics are referred to, they are named by their common property: for instance all word-types ending in *-s* in the nominative are called *s*-words. For certain purposes even larger groups of words need to be discussed, and they are indicated by a slash: all words ending in either *-e* or *-i* in the nominative are called *i/e*-words, as opposed to *i:e*-words, which traditionally indicates the word-types which end in *i* in the nominative but have a vowel stem ending in *-e-*, and may or may not have a consonant stem as well. Similarly, *i:i* refers to words with no vowel change in the singular.

In addition to commonly used terms like *suffix* (or *ending*) for indicators of case and occasionally for other inflectional morphemes, and *marker*, which in this study is mainly needed for the indicator of the plural, the term *inflectional formative* will also be employed. This choice is further discussed in 3.2.3.

3.2.2 Descriptions of Finnish morphology

Considering the complexity of Finnish morphology, it could be expected to be the subject of active research and teaching in Finland. In a way it is: there are extensive monographs on the morphology of Finnish dialects and closely related Finnic languages. There is also an extensive morphological archive, collected by students and researchers following a scheme set out by T. Itkonen (1969). It is possible to look up enormous quantities of word-form samples from all parts of Finland, partly elicited, partly transcribed from interviews.

A look at school grammars, however, shows that morphology is treated as a matter of minor importance. Also in *Virittäjä*, the most important publication of Finnish linguistics, the articles on syntax, phonetics, etymology and derivation, together with articles concerned with the purity and standardization of Finnish, by far outnumber those on inflectional morphology. The reason is obvious: a native speaker needs little morphological advice, and thus morphology is not a practical problem. The researcher into native Finnish is

[25] *Inflection* and *declension* are used synonymously in this study, as the inflection of verbs is not discussed.

interested in the rare exceptional forms and dialectal variety, not in the common forms known to everybody. Only research in the marginal areas, such as the study of child language or aphasic language, has addressed the core area of morphology. Even the century and a half of teaching Finnish in the schools for the Swedish-speaking population has failed to provoke any extensive research efforts in this field.

Until the last two decades, the theory of morphology has also attracted little explicit attention. All Finnish grammars include morphology, but the theoretical basis of the description is often not laid out: it is left for the reader to infer. The first exception was Kalevi Wiik (1967), who applied the tools and framework of transformational grammar to the Finnish inflectional system. The most thorough and extensive discussion of various theoretical approaches to Finnish morphology can be found in Karlsson (1982b; see also Karlsson 1977). Some aspects or specific areas were also theoretically approached in many articles before Karlsson (e.g. Campbell 1975, Paunonen 1976, Skousen 1980). Raimo Anttila and Esa Itkonen have also addressed many important morphological questions from a theoretical angle (see Section 2.4. and below), and recently Urho Määttä has thoroughly explored functional explanations in Finnish morphology (1994).

Historical notes

The earliest Finnish textbooks, written in the seventeenth century, have been analyzed by Vihonen (1978). The first Finnish grammar by Petraeus (1649) was, as were all grammars of the time, based on Latin categories, and intended for "the Swedish, German, Scotch and other aliens, for whom it was embarrassing that they did not know if they spoke Finnish right or wrong" (Vihonen 1978, 29).

In the seventeenth and eighteenth centuries only some Swedish civil servants needed to acquire a functional command of Finnish to deal with the Finnish-speaking majority population. The separation of Finland from Sweden in 1809 gradually led to the increased importance of the Finnish language. The School Act of 1842 made Finnish a subject of instruction for the Swedish language schools in Finland.[26] The earliest textbooks were grammars written in Swedish. The first textbooks with didactic ambitions were those by V. R. Kockström and J. F. Ollinen. From the 1930s on Harry Streng wrote several textbooks and laid the foundation for the teaching tradition which has lasted until the present time. (Geber 1982, 116.)

Kalevi Wiik (1988) has compared the presentation of noun declension in Finnish and Estonian grammars over the last 350 years. He divides the history of the treatment of declension into the following periods:

[26]In practice this intially meant all secondary schools, since the first secondary school where the medium of instruction was Finnish was not founded until 1858.

(1) Grammars written before 1824 (including that of Kustaa Renvall, which was written earlier, although published only in 1840). The typical feature is that the nominative is used as the basic form from which the other forms are derived.

(2) Reinhold Becker (1824) brings into use the concept of stem and uses the strong vowel stem as the starting point for the process of declension.

(3) The latter part of the nineteenth century is called by Wiik the period of abstractivism. Under the influence of Elias Lönnrot historical explanations were brought into grammars, thus postulating an abstract base form on which current forms were based.

(4) At the turn of the century E. N. Setälä separated synchronic and diachronic descriptions of language. He also introduced the set of four noun forms ("the principal parts of nouns") on which all others could be based.

(5) The period of abstract generativism, represented by Wiik (1967).

(6) The period of natural phonology and emphasis on psychological reality, starting in the 1970s.

International trends in morphology are to some extent reflected in the descriptions of inflection, although the change of direction between the first and second period owes more to the fact that v. Becker's grammar was no longer intended for learners. However, the development of scientific grammars naturally influenced the choices made in pedagogic grammars all along. The Neogrammarian tradition, introduced by Setälä, has been particularly strong. Structuralist thinking was less important in the development of morphological descriptions of Finnish, although the description of inflection in *Nykysuomen sanakirja* (the older standard dictionary of Finnish, hereafter NS) could be seen as a part of this tradition.

Current descriptions

Finnish word-forms can be described in several ways. The simplest way is to list all words with all their forms. This has not been seriously advocated by any scholars of Finnish. As was pointed out by Karlsson (1982b: 22–24 and 356–358), it would be very cumbersome in Finnish, where each noun has about 2,200 and each verb 12,000 forms. Furthermore, a bare listing of word-forms would not include any information about the structure of the language or about the relationships of the word-forms to each other. The only achievement of a model of this type would then be define (at least implicitly) what a word is.

Another overall view of morphology found in Finnish grammars suggests that morphology consists of a list of basic forms and a rule system by which all forms can be produced from the base form, i.e. the Item-and-Process model of morphology. The choice of the basic forms varies, as does the formulation of rules. Rules may be either phonological or morphological in nature (see for example consonant gradation, Section 3.2.3). They may be descriptive, asking the reader to look for certain features and then to replace them with others under given conditions, or formal and explicit, as in TG-grammars. They may also build on historical information about sound changes. The most recent and

comprehensive description of this type can be found in Karlsson (1982b), or in his grammars intended for non-native speakers (Karlsson 1982a, 1983a).[27]

That rule systems function in a computer was first demonstrated by Kalevi Wiik in 1967, and later for instance by Eugen Holman's CALL-programme Finnmorf in 1986, as well as by several more sophisticated programmes.[28] There is no perfect rule-solution, however: many words need to be dealt with separately, since their inflection cannot be deduced from the base form alone. Furthermore, there is often more than one possible form for one function (there can be as many as five plural genitives), or there are other types of exceptions.

The approach found in the monolingual dictionaries (NS and its newer version *Suomen kielen perussanakirja*, hereafter SKP) lists the partial paradigms of nominal types and verb types, with a model word for each, i.e. the Word-and-Paradigm model of morphology. The entries in the dictionaries are provided with numbers to indicate the inflectional type. The lists of types do not include the variety caused by consonant gradation, i.e. words like

kanto : *kannossa* '(in) tree stump'
kannu : *kannussa* '(in) jug, pitcher'

both belong to the same type. In the older dictionary version the existence of consonant gradation is indicated by an asterisk, with no examples or explanations. The newer dictionary includes a consonant gradation chart (see p. 61), which is referred to in the entries for words subject to gradation.

The number of inflectional types varies. NS has 85 nominal types and 45 verb types, SKP 51 and 27 respectively. E. N. Setälä (1966) lists 29 nominal types, Raun (1959) 10, and Cannelin only 5 (1932, 10–32). This variety illustrates the basic dilemma in the description of Finnish morphology: if the number of word-types is reduced, the number of rules will have to be increased, and vice versa. This controversy is related to two theoretical problems: the existence and position of morphemes and allomorphs in the description, and the choice (or even existence) of basic forms. These are discussed in more detail in 3.2.3.

The theoretical question of whether morphemes or allomorphs should be the basic units of morphological description is quite important in Finnish. It is intimately related to the general morphological approach chosen: in a competence-centred framework it is possible to assign allomorphs to a secondary role. They can be derived from abstract morphemes by contextual rules. In a paradigm presentation, allomorphs must appear as such (cf. Paunonen 1976). For a learner, allomorphs are very real. The degree of their independence in a learner's grammar is likely to vary, as will be seen in the discussion of the data below. It may not only be dependent on language-internal factors but also on individual cognitive differences (cf. Anttila 1974, 336).

The fourth type of description is generally not found in the research literature but in textbooks of Finnish as a second or foreign language. It shares

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[27]Karlsson (1982b, 365) points out, however, that in addition to rules, paradigms are also needed for the description of language.

[28]For a list of computational models of Finnish morphology, see Kettunen 1991.

properties with all the approaches above: the learner is usually advised to memorize some word-forms as such, apply certain rules in the formation of others, and use some paradigms as models for yet another set of words. The approach is usually not explicitly based on any theoretical view of either describing or learning morphology, but on the experience of the teacher-writers about what seems to be the easiest way for their students to learn. Older textbooks generally tend to rely more on rules and the newer ones on model paradigms.

It is also possible to read a description in more than one way. For instance, F. Karlsson's *Finnish Grammar* (1983a), intended for L2 learners of Finnish, is written within the IP framework, but after formulations of rules, tables of examples are given. The tables are usually set out in such a way that a reader who prefers a WP type framework can simply study the concrete forms in the tables as such, without paying attention to the rules, and get at least a preliminary picture of Finnish inflection.

Functional approaches

A functional view of language is implicitly present in many descriptions of Finnish morphology (Määttä 1994, 260). It is seldom explicitly displayed or defined, as the tradition in Finnish linguistic writing has been to leave the theoretical framework of the study for the reader to infer. Thus Määttä's extensive work is most welcome in unveiling the functionalism in Finnish morphological research. Instead of attempting to summarize it, I will only add some remarks below.

Functional explanations of Finnish morphology are most apparent among the supporters of the paradigmatic view of morphology, also called field morphology.[29] This view is best argued for by Paunonen (1976). A key concept in his theory is the allomorph, which is given an independent position, while the abstract concepts of morpheme (in the IA theory) or base form (in the IP theory) are rejected as psychologically unnatural. Groups of word-forms are described as paradigms which interact dynamically with each other. These paradigms form an inflectional field, held together by associative forces within and between the paradigms. These forces include both semantic and structural analogies.

Paunonen's model recognizes the interplay of stem allomorphy and suffix allomorphy, which makes his model particularly interesting for a study of learner language. Learners, unlike native speaker grammarians, do not know the outcomes of grammatical processes in advance, and thus often experience difficulty trying to apply rule-based models which list the two sets of rules separately (see p. 194).

Another example of a very different functional approach is Antti Iivonen's list of functional uses for quantity dichotomy (1978). In learner language

[29]The term *field morphology* is ambiguous in English. Here it refers to a morphological model in which word-forms are seen to form many kinds of associative connection. It does not refer here to morphological field work, which has also had an important status in Finland.

semantic influences were sought in Martin (1995a). Some initial attempts towards the functional organization of a grammar can also be seen in new teaching materials of Finnish as a second or foreign language (Vähämäki 1994, Leney 1993).

The descriptive grammar of Finnish by Sulkala and Karjalainen (1992) has some functional features, but the authors have been limited by the structure of the book, dictated by the publisher of the series.[30] The book aptly illustrates the conclusion reached by S. N. Sridhar (1989, 223–224) in his study of ten languages (including Finnish) and 300 informants: his results "lend strong support to the functionalist programme in linguistics and psycholinguistics". However, his functionalism is not of the naive variety which sees "linguistic structure as a mere epiphenomenon of cognitive structure", but he supports a complex form of functionalism that recognizes the independent effect of typological constraints on language structure.

Määttä's focus is metatheoretical. His functionalism is largely evolutionary. The starting point is the principle of morphological isomorphism, which he equates with the one form — one function principle (1994, 1). In this study, functionalism will be seen from a much wider perspective. This will include Määttä's theoretical perspective, the language-specific view of Sridhar above, the many forms — many functions view of the Competition Model (see 2.4), as well as the learners' practical need for expressions for their ideas.[31] I will also include the possibility that the interlanguage of learners may reflect form-function correspondences between L1 and L2 (cf. Wenzell 1988, 96). This comprehensive view of functionalism is in accordance with the eclectic nature of this study: explanations are to be sought from wherever they may be found.

The descriptions of Finnish morphology mentioned in this chapter were not written with the production processes of learners in mind. For this reason the comments presented here have little bearing on the usability of these descriptions for their original purposes, but are only valid in the context of this study, where they are used in an attempt to build a working model of Finnish morphology for the benefit of learners.

3.2.3 Features of Finnish nominal inflection

Finnish is usually classified as an agglutinative language. This is true in the sense that morpheme boundaries are fairly clear for linguists, although not necessarily for language users. Moreover, the abundance of stem changes obscures the word-internal structure. Historical development has led from clear boundaries into a greater degree of opaqueness of word-forms and towards more analytical expressions (for examples see F. Karlsson 1975, 60–61). For learners, however, agglutination is an important starting point, as combining

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[30]The series consists of descriptions of many languages, with a uniform table of contents. Linguists can thus easily look up data from different languages for comparison.

[31]This last area, the functional vs. formal approach in language teaching, has been thoroughly discussed from a historical viewpoint in Laihiala-Kankainen (1993).

units is a familiar and simple cognitive operation. Thus a balance between emphasizing regularity and focusing on alternation must be found.

In this chapter some features of the nominal inflection system are explained, particularly to assist readers who do not know Finnish. The descriptions are based on the morphological models mentioned in 3.2.2 and limited to phenomena necessary for the data analysis. Information about consonant gradation (and to a lesser extent, vowel harmony) are needed for understanding some features of the data. The basic form question is naturally more important in the IP-models, while the principal parts of nominals are essential for the WP-descriptions. The inflectional suffixes and properties of various word-types are reviewed to the extent that they occur in the data. Finally, some information about the frequency of nominal types and case usage is presented.

Consonant gradation

Consonant gradation involves the stem plosives */k, p, t/*, which can occur in either a strong or a weak form. The list of the alternating pairs with sample nominals is given in Table 1 (SKP 1990, XIX).

TABLE 1 Pairs of alternating consonants with sample words.

	nominative	genitive	
kk:k	takki	takin	'coat'
k:kk	hake	hakkeen	'chips'
pp:p	kaappi	kaapin	'cupboard'
p:pp	opas	oppaan	'guide'
tt:t	tyttö	tytön	'girl'
t:tt	kate	katteen	'coverage'
k:0	reikä	reiän	'hole'
0:k	aie	aikeen	'intention'
p:v	sopu	sovun	'harmony'
v:p	taive	taipeen	'bend'
t:d	satu	sadun	'story'
d:t	keidas	keitaan	'oasis'
nk:ng	aurinko	auringon	'sun'
ng:nk	rengas	renkaan	'ring'
mp:mm	kumpi	kumman	'which'
mm:mp	lumme	lumpeen	'water lily'
lt:ll	ilta	illan	'evening'
ll:lt	sivellin	siveltimen	'brush'
nt:nn	hento	hennon	'slight'
nn:nt	vanne	vanteen	'hoop'
rt:rr	virta	virran	'stream'
rr:rt	porras	portaan	'stair'
k:j	arki	arjen	'workday'
j:k	hylje	hylkeen	'seal'
k:v	suku	suvun	'family'

Consonant gradation affects about 21% of Finnish words (Karlsson 1982b, 323), nominals, verbs and particles alike. The strong form can usually be found in the nominative and the weak one in the genitive stem. There are certain groups of nominals, however, where the weak grade is found in the nominative and the strong grade in the genitive stem. This is often called *reverse gradation*. Apart from the *k:v*-gradation, the table above contains examples of both kinds of gradation.

In this study the term *consonant gradation* is used to refer to the two-way relationship between a strong and a weak grade, i.e. gradation is potentially present whenever a word contains a voiceless stop at the beginning of the last syllable. This usage differs from that of F. Karlsson (1983a, 30), where the "form to which the rules of consonant gradation are applied is called the 'strong grade', and the resulting alternative form is called the 'weak grade'". Thus the strong stem is considered to be non-graded and gradation is the process of weakening under certain conditions. The two usages are based on two different views of inflection. As, in my view, inflection is not based on rules alone, I consequently do not consider the strong grade automatically to be any more basic than the weak grade, but treat them as equal alternants, unless there is evidence to the contrary.

More generally, the position given to consonant gradation in descriptions of Finnish depends on the overall linguistic framework adopted. Karlsson's view is primarily processual, reflected in the use of the term *gradation*. Räisänen (1991), among others, supports the paradigmatic view of morphology, and thus regards gradation as a pair of alternating stem forms. This view is closer to the one adopted in this study, although processual explanations are also explored in the analysis of the data.

Consonant gradation can be seen as either phonologically or morphologically conditioned. In earlier descriptions, phonological constraints take precedence: the strong grade appears at the beginning of an open syllable, the weak grade before a closed syllable (see e.g. Setälä & Sadeniemi 1966, 35; L. Hakulinen 1979, 60–65). Phonologically, consonant gradation is thus a balance phenomenon: the addition of a consonant at the end of a syllable causes the consonant at the beginning to weaken. Exceptions are explained as historical relics: syllables which were formerly open have become closed and vice versa, but the stem consonant has remained unchanged.[32]

Synchronically, consonant gradation is morphologically conditioned (F. Karlsson 1974, 92–102; Hammarberg 1974). The main argument for this is that phonological conditioning no longer functions with any regularity. This is shown by the numerous forms with a weak grade in an open syllable and a strong grade in a closed syllable (e.g. *osoite* : *osoitteen* 'address'). Certain forms (usually the nominative, partitive, essive and illative in the singular) have a strong stem, while others build on the weak stem. Words ending in *-e* or a consonant (*-s*, *-n*, *-l*, *-r*) have reverse gradation: the nominative and partitive

[32]For further information, and a description of the consonant gradation system, see Karlsson (1983b, 31–33), and, for the historical development of the system, (Hakulinen 1979, 60–65).

singular have the weak grade, while all other cases have the strong stem. Gradation is triggered by case endings, but not by possessive suffixes. In his grammar for learners Karlsson combines phonological and morphological rules (1983a, 30–35).

Neither phonological nor morphological arguments explain all incidences of consonant gradation. Proper nouns, baby talk, slang, new loan words, acronyms and affective language often include items which are not graded, despite containing a phonotactic string which is normally subject to gradation (Yli-Vakkuri 1976, 53; Leiwo 1982, 64; Laalo 1983, 83; Räisänen 1991, 109). Consonant gradation is thus also lexically conditioned. Novel words tend not to be graded, but the item does not need to be new in the language as a whole, only new to the speaker concerned (Yli-Vakkuri 1976, 60). Thus the limits of gradation are not only lexical, but also individual, as is also seen in Chapter 5. Sometimes uncertainty about the status of a word is reflected as variation: a Finnish neighbour of mine used the forms *hildit*, *hiltejä* and *hiltit* (< *hilti* 'a type of small explosive') within one utterance.

Quantitative and qualitative gradation are different in nature. The former is literally a matter of gradation of the length of the consonant. The latter is synchronically not gradation but alternation between two different phonemes. They may have common roots but in contemporary Finnish they are different in nature. Quantitative consonant gradation is more resistant to erosion than qualitative gradation (Yli-Vakkuri 1976, Räisänen 1991). The latter often results in phonotactically rare combinations of sounds or in a change of the number of syllables, which reduces the probability of gradation (Räisänen 1991, 117). Karlsson (1982b, 330–331) even claims that the words subject to qualitative gradation are marked.

Quantitative gradation is applied to the great majority of words, old or new. Thus, its phonological constraints are by no means synchronically dead; native speakers of Finnish feel the need for its balancing effect in their language and apply it accordingly. For learners the situation is different. Once they have a grasp of the general morphological and/or phonological constraints on gradation, qualitative gradation presents problems similar to those met by native speakers: Which words are subject to gradation and which are not? Quantitative gradation involves an additional difficulty: the quantity itself. Most learners find it easier to distinguish between *t* and *d*, *p* and *v*, etc. than between long and short plosives, although the phonology of L1 obviously greatly influences this ability.

The physical length of a sound in Finnish cannot be said to be either short or long in any absolute sense, but its duration depends on the structure of the word, and on many other factors (see Lehtonen 1970). The perception of quantity is thus not based on the actual length of the consonant alone but also on other information, such as semantic, syntactic and morphological cues and the rhythmic structure of the word as a whole. However, fortunately for learners who struggle with the interpretation and production of consonant length, the closure duration for the plosives is a relevant parameter in the geminate vs. non-geminate distinction. This has been experimentally shown by Tapio Hokkanen (1992, 47–48), who concludes that although the perception

curves overlap, the results suggest that the boundaries between each quantity class are quite clear. Duration is thus a crucial cue for the perception of different grades. The two-peaked distribution of duration also serves as a "natural" explanation for the pair-wise operation of gradation.

Vowel harmony

The raison d'être given for vowel harmony has usually been ease of pronunciation, the economical use of the speech organs (see e.g. L. Hakulinen 1979, 22, 33–34). Its role as a boundary marker has also been mentioned. In addition to these, the main reason given by Karlsson is added word-internal cohesion (1982b, 104). Suomi (1983, 1984) points out that vowel harmony, or the lack of it, is no guarantee of the word boundary. Also, if ease of pronunciation is the reason, why do not all languages have vowel harmony? He bases his arguments on the analysis of vowel quality, and concludes that speakers of a vowel harmony language benefit from predictions concerning the second formant of non-initial syllables, whereas speakers of languages with no vowel harmony do not. This directly relates to a structural difference between the sound patterns of those languages.

One might assume that vowel harmony constitutes a learning problem somewhat similar to that presented by qualitative consonant gradation (see e.g. Leiwo 1977, 85, 206). After all, mastering vowel harmony requires that the learner can distinguish and produce sound segments to recognize and use words, and to choose the correct alternative suffix for a given context. Furthermore, new words are not always subject to vowel harmony constraints (Karlsson 1982b, 100–104; Laalo 1983, 83). Both vowel harmony and consonant gradation are also used as predictors to aid reception.

In practice, however, both learners and their interlocutors[33] agree that vowel harmony errors are relatively insignificant in communication. Apart from new loans and slang, vowel harmony is automatic in the speech of native speakers of Finnish. This may cause them to perceive vowel harmony even where it is not present, thus helping them to interpret speech containing vowel harmony errors. This reduces their morphological significance: the vowel choice in an affix is of little significance. As the focus of this study is on the stem variants, while affix variants are only discussed insofar as they affect stem choices, vowel harmony is of importance only in the interpretation of the test results in Section 5.2.

The basic form question

Rule-based processing requires a starting point. Paradigm members can theoretically be equal, but one member is usually chosen as more basic than the

[33]On several occassions, I have asked teachers of Finnish to rate errors as to their seriousness. Almost unanimously consonant gradation errors are graded as more serious than vowel harmony errors. Similarly, learners report that vowel harmony errors are seldom corrected by interlocutors.

others. This tendency is demonstrated in the naming of the inflectional types of Finnish (*risti*-type instead of *ristin*-type, for instance). This basic form, which serves to identify the lexeme in general, can also be called the *leading form*, or *unmarked form* (Matthews 1974, 72; 150–151). The candidates for the basic form in Finnish are the singular nominative form and the inflectional stems. The arguments for the choice spring from both theoretical and practical sources.

Ample psycholinguistic evidence is listed in support of the nominative by F. Karlsson (1982b, 197–200): child language data show that children base declension on the nominative, although some examples of stems as basic forms can also be found. Data from adult aphasic patients show similar tendencies. New loan words tend to accumulate in inflectional types in which declension can be based directly on the nominative. The nominative is also the most frequently occurring case.

Furthermore, unknown words are generally declined by having the forms based on the nominative (Yli-Vakkuri 1976, see also Chapter 5 of this study). Speech errors of American Finns tend towards the nominative, although again there is some contrary evidence as well (Martin 1989, 171–193). Moreover, in Chapter 7 of this study many examples show that learners base declension on the nominative, although it is not possible to say whether this is a natural psychological tendency or due to teaching practices.

On the basis of their processing experiments, Niemi et al. (1994) conclude that the nominative singular is the easiest to process and thus the psychologically real base form of Finnish nouns. Similar evidence for German is found by MacWhinney et al. (1989).

Since v. Becker's 1824 grammar the strong vowel stem has competed with the nominative for the position of the basic form. The arguments for the basic position of a stem form originate from the need to simplify the rules required for the production of other forms. From the paradigmatic point of view, replacing the nominative by a stem reduces the number of declensional types, since noun stems are inflectionally less ambiguous than nominatives.

Even if Karlsson argues for the psychological reality of the nominative basic form, in his teaching grammar he bases the listing of vowel changes alternately on the nominative (e.g. *tunti*) or on the stem (e.g. *lapse-*, *naise-*; 1983, 40–41).[34] To the reader the use of the stem comes as a surprise, as s/he is left to wonder how the stem can be found. The weak vowel stem is explicitly used as a basic form in one textbook (Lepäsmaa & Silfverberg 1987). Many other textbooks list the nominative and genitive singular side by side, thus implying the equal status of the two stems.

For the native speaker grammarian the stem may offer advantages for economy of description. For the learner, however, the practical and psychological reality is more important. If the learner is to function on the strength of a dictionary and a grammar book, the use of the nominative as the base of the declension is unavoidable, as stems are rarely listed in dictionaries

[34]It cannot be determined whether the strong stem or the weak one is intended here, as the examples are not subject to gradation.

of Finnish. Furthermore, learners who use native speakers as their vocabulary source are likely to be given nominatives rather than stems. The simplest possible grammar is not always the psychologically most real one, nor is it the one which learners acquire (Campbell 1975, 25). For the purposes of this study, the nominative is thus a more suitable basic form than the stem.

Principal parts of nominals

The principal parts of nominals in Finnish are customarily taken to be the following: *nominative singular : partitive singular : genitive singular : partitive plural.* This set of forms is considered to give enough information to allow one to produce the other forms, although they do not guarantee 100% success even when no "rules" are violated. The forms necessary for complete prediction of the paradigm vary from one word-type to another, as does their number (see Paunonen 1976).

The above order was chosen for this study[35] because the phonological properties of the various noun types are discussed, and the nominative and partitive singular are always in the same grade (either both strong or both weak), while the genitive singular is always in the opposite grade. The nominative — genitive — partitive order can be defended for teaching purposes as giving the more frequent stem first, the genitive stem being the base for the local case formation and many other purposes (comparison, derivation). It has also been promoted in teaching because of its rhythm, which has been found to aid memorization (Erik Geber, personal communication).

Among teachers of Finnish as a second language there is disagreement on the order of the forms to be given. Aaltio (1973) lists the genitive before the partitive singular, but in the more recent edition of the same book (1984) the order has been reversed, even if the genitive is still taught well before the partitive. Nuutinen (1983) does the same: the partitive is listed first but taught second. Lepäsmaa & Silfverberg (1987) list the forms vertically, which seems to discourage reading them in succession, in the order of nominative — partitive — stem (not genitive). They also teach both the partitive and all local cases before the genitive. Hämäläinen (1988) both lists and teaches the genitive first.

Notes on suffixes

The Finnish language has a large array of affixes, but only *case*[36] *suffixes* (or *endings*) and *plural markers* are within the domain of this study. Some case endings have only one form (e.g. *-n* for genitive singular). Many have two variants, the choice between them being subject to the vowel quality in the stem

[35]However, the principal parts are not automatically listed for every word in this study, but the set of forms given will depend on the issue at hand.

[36]For a list of the Finnish cases see Table 2 (p. 75).

(e.g. *-ssA* in *talossa* 'in a house' or *metsässä* 'in a forest'). In the singular, only the partitive and the illative have a more complex morphology.

For the partitive singular, distribution of the alternate endings (*A*, *tA* and *ttA*[37]) can be described by rules, which can, to a great extent, be based on the phonological characteristics of the nominative:

For words ending in a vowel:
(1) If the nominative ends in a short vowel other than *-e*, add *A*, e.g. *talo/a* 'house';
(2) If the nominative ends in a short *-e*, add *ttA*, e.g. *perhe/ttä* 'family';
(3) If the nominative ends in a long vowel, add *tA*, e.g. *harmaa/ta* 'grey'.

For words ending in a consonant:
(4) Generally add *tA*, e.g. *kevät/tä* 'spring', except
(5a) If the nominative ends in *-nen*, replace *-nen* by *-stA*[38], e.g. *suomalainen : suomalaista* 'Finnish';
(5b) If the nominative ends in *-UUs*, replace it by *-UUttA*, e.g. *uutuus : uutuutta* 'novelty';
(5c) For foreign names and other words, add *-iA*, e.g. *Saab : Saabia*.

These rules cover the great majority of the partitive singular forms in Finnish. The exceptions constitute about 1.4% of Finnish nominals. This consists of the *i:e*-words which have several alternatives (*suomi* : *suomea* 'Finnish', *kieli* : *kieltä* 'language', *vesi* : *vettä* 'water', etc.), the *e:e*-words (*nalle* : *nallen* 'teddy bear') and the names of properties or characteristics which are mainly derived from adjectives and do not end in *-UUs* (*rikkaus* : *rikkautta* 'richness'). The new or rare words in all of these groups remain problematic for many learners (as they are for native speakers, as indicated by the nonce word inflection task in Chapter 5), while the commonly used *i:e*-words, in particular, are soon memorized.

The illative singular also has three endings (*Vn*, *hVn* and *seen*, e.g. *talo/on* 'into a house'; *työ/hön* 'to work'; *Lontooseen* 'to London'). The rules for the choice of the ending variant based directly on the nominative are more complex than they are for the partitive — even if the illative also has the strong grade like most nominatives. This is partly because the number of syllables in the stem is an additional factor. For this reason the illative formation rules are based on the vowel stem (see e.g. Karlsson 1983a 103–104; the rules in other textbooks are very similar).[39] Once the strong vowel stem is known, the rules themselves are about equal in complexity with those for the partitive. There is, however, the complication of consonant gradation: the vowel stem is normally learned as the genitive stem, which has the weak grade for most nominals. The strong vowel stem has often not occurred before the illative is encountered. Thus the illative formation, starting from the nominative, consists of several steps:

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[37]It can be argued that the first *t* is a part of the stem, as it historically is, but here the position of F. Karlsson (1982b, 280–281), based on synchronic variation, has been adopted.

[38]In the rules (5a)–(5c) a part of the stem is included, not only the ending, as this is what happens (at least in the surface form).

[39]As the illative case plays a very minor role in this study, the rules are not outlined here.

(1) Form the genitive stem (or access the genitive from memory and remove the *-n*).
(2) Check consonant gradation. If it exists, choose the strong grade.
(3) Apply the illative formation rules. This requires counting the number of the syllables in the stem and checking the number and quality of the stem-final vowels.

A rule of thumb to the effect that one must "take the consonants from the nominative and the vowels from the genitive" combines the first two steps and may simplify the process a little, but it does not apply to all word-types. No matter how the rules are formulated, they remain complicated for the learner. This is even more so because all other local cases — which are usually handled as a group in teaching and textbooks — can be formed directly from the genitive by replacing the *-n* with another ending.

The plurals of nominals in Finnish consist of a stem, including the potential derivational markers, a plural marker, and a case ending (plus a possessive suffix and clitics). The plural marker for the nominative (which has no case ending) is *t*, e.g. *talo/t* 'the houses'. Otherwise the plural marker is *i* or *j*, e.g. *talo/i/ssa* 'in houses' or *talo/j/en* 'of houses'. The case endings are largely, but not always, the same as in the singular. The interaction of the stem-final elements, the plural marker, and the case ending produce a great variety of word-final strings which are largely the reason why so many word-types have been established in descriptions of Finnish (see 3.2.2).

In addition to endings and markers the term *inflectional formative* will also be employed in this study. It has been borrowed from Matthews (1974, 74–75), who uses it to "refer to elements at any stage throughout the derivation". The examples he gives reveal that "derivation" here does not mean derivation of new words, but what could be called the process of inflection, which potentially includes several steps, and it refers to "every 'paradigm-forming' element". Thus, Matthews uses it to cover with one word the items which are traditionally called endings and markers in Finnish grammars. In the present study this distinction is kept and the term inflectional formative is used — differing somewhat from Matthews' usage — as a general term to refer to inflectional units which in linguistic analysis can be said to consist of more than one morpheme, but which are perceived as one unit.

An example of an inflectional formative would be the *-iä* in *kenkiä* 'shoes', which has been 'borrowed' to form **keittiä* (< *keitto* 'soup', pro *keittoja*). Specifically, this and other similar units used to build plural partitive forms will be called *plural partitive formatives*. Inflectional formatives in learner language may consist of not only inflectional morphemes but also parts of the stem or derivational morphemes and cannot therefore always be separated from the stem along the morpheme boundaries. A subtype of an inflectional formative is the /*t*/ which occurs in many verb suffixes and stems. Cathey and Wheeler (1986, 132) actually divide the Finnish verbal endings into those which involve /*t*/ and those which do not. A similar solution was independently reached by Martin (1989, 265–268) in a discussion of the problems which American Finns have in verbal morphology.

Psycholinguistically, inflectional formatives resemble portmanteau morphs. At least in the Finnish tradition this term refers to morphs which cannot be

divided into segments but contain two grammatical functions which in other contexts are expressed by separate indicators (Hakulinen & Ojanen 1976, 117). From the viewpoint of the person who said *keittiä* the *-iä* could then be interpreted as a portmanteau morph: it comprises two functions, those of the plural and the partitive, but is seen as a whole which can be separated from one stem and attached to another. However, the term portmanteau morph is normally used to refer to items which occur in the standard language and are the results of a historical development which has led to the disappearence of the morpheme boundary, as in the case of the Finnish inessive suffix *-ssA*, which has developed from the two-morphic combination *-s+nA*. Their position in the language system is very different from the items I call inflectional formatives, which are (possibly transient) phenomena of learners' interlanguage or native speakers' temporary products.

Characteristics of some word-types

At the core of this study are the stem changes which occur as inflectional morphemes are added. Some are automatic in the sense that the phonological shape of the form in question determines what can occur in other forms. Many forms, however, are enigmatic (Paunonen 1976). These are discussed below. For a more complete presentation of the Finnish nominal inflection system for speakers of other languages, see Karlsson 1983a or White 1993. Some details of the system are also explained in Chapters 5–7 as they occur in the data.

In the singular, the words which end in a vowel other than *i* or *e* are nearly non-ambiguous, apart from the consonant gradation. Thus only the *i/e*-words are discussed here.

It is not at all within the Finnish grammatical tradition to present these words as one group. However, when both singular and plural forms are examined, the alternation of the two vowels in many words is confusing for learners. Examples of these are:

tuli : tulen : tulia : tulien 'fire'
tuoli : tuolin : tuoleja : tuolien 'chair'
nuori : nuoren : nuoria : nuorten 'young'
nalle : nallen : nalleja : nallejen 'teddy bear'
paperi : paperia : papereita : papereiden 'paper'
perhe : perhettä : perheitä : perheiden 'family'

Nominals with an *-i* in the nominative may have either an *e* or an *i* in the stem. The *e*-stemmed ones have an *i* in the plural (but not in all forms, e.g. *nuorten*) and the *i*-stemmed ones have an *e* or both *i* and *e* (*tuolien*). From the *e*-stem it is not possible to predict with certainty whether the nominative ends in an *e* or an *i*.

The alternation may not seem unpredictable for speakers of Finnish, who have established paradigm patterns and a secure phonemic system, but for a learner (and for Finnish children) the variety of types poses a problem. Thus it is the learners' view of Finnish which is respected here. The group is also growing continuously, as most borrowed nominals (*filmi* : *filmin* 'film'; *karaoke*

: *karaoken* 'karaoke') and many newly derived or coined ones (*jätski* : *jätskin* 'ice-cream'; *levyke* : *levykkeen* 'diskette') fall into this category (cf. also Karlsson 1982b, 207, Martin 1993a, 98).

Traditionally the nominals with the *-e*-nominative are divided into two categories:

> 1) Those which formerly ended in a consonant, with the consequences still visible in the inflection:
> *hame* : *hametta* : *hameen* < **hameh* : **hamehta* : **hamehen*.[40] 'skirt'
>
> (2) Those which show no sign of a former consonant:
> *nalle* : *nallea* : *nallen* '(teddy) bear'.

This division is problematic for the learner, since the inflection cannot be predicted by the nominative. This is shown by the fact that new words may have two competing paradigms among native speakers. This is the case currently at least with *psyyke* : *psyykeä/psyykettä* : *psyyken/psyykkeen* 'psyche' (Laalo 1989). Furthermore, the use of a historical explanation as a basis for the division would seem to indicate that the words belonging to the first group all share the same crucial historical phase. This, however, is not the case: the first group is productive and includes a large number of new words which never had the final consonant, but nevertheless display the same behaviour as the older words.[41]

It can be argued that the two types above differ in the nominative, as the first type produces the lengthening of the following consonant in standard spoken continuous Finnish (*hame* + *kin* > *hamekkin* 'skirt, too'; *hamep päälle* '(put) a skirt on'). This feature, however, is not present when single words are discussed (as they often are in teaching situations) or when the word is in final position in an utterance. Nor is it used in all dialects, and there is no sign of it in writing. Furthermore, as the length distinctions beyond the first one or two syllables are one of the last things learners acquire, it is probable that many learners simply never hear any difference between people who say *sadetakki* 'rain coat' and those who say *sadettakki*. Thus this feature is not likely to help learners to distinguish between paradigms.[42]

The situation with the *i*-nominatives is even more complicated. In its list of inflectional types, NS has 28 types in which the model word ends in an *i*. In

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[40]The asterisk here indicates that the form is not current in the language of most speakers, while it may exist in certain dialects.

[41]The list of inflectional types in SKP has three other types ending in an *-e* (at least in pronunciation), with the model words *filee, rosé* and *parfait*, which are excluded here as rarities, and *tee*, which can be included with other one-syllable nouns ending in a long vowel – if it needs to be included anywhere, since it rarely causes any inflectional problems.

[42]When discussing this issue with linguists I often receive quite adamant statements about how obvious this distinction is for speakers of Finnish. However, I know of no studies in which the position of this feature in the linguistic cognition of Finns has been experimentally tested.

SKP these have been reduced to 14. Both figures include *vanhempi* 'older', a comparative which is exluded here except for the test presented in Chapter 5. Several of the distinctions only exist in the plural — and even there the differences are sometimes matters of the popularity of the various alternatives. Consequently, for a discussion of the singular forms, the system can be reduced to the following classes:

(1) No stem vowel changes: *tuoli* : *tuolia* : *tuolin* 'chair'.

(2) The nominative has an *i*, the stem vowel is an *e*: *ovi* : *ovea* : *oven* 'door'.

(3) The nominative has an *i*, the stem vowel is an *e*, with no vovel in the partitive form: *kieli* : *kieltä* : *kielen* 'language, tongue'.

(4) Other changes in addition to the ones above: *vesi* : *vettä* : *veden* : *vetenä* 'water'.

This type of division can be found in many textbooks, and it effectively reduces the number of model paradigms to be remembered. For the learner, there are two kinds of problem with this commonly used approach to nominal inflection. The first set of problems arises from the fact that this classification obviously does not cover everything that can happen to the shape of the *i*-nouns in the course of inflection. In addition to many sporadic changes, as in *lumi* : *lunta* : *lumen* 'snow' or *lapsi* : *lasta* : *lapsen* 'child', which are accounted for in the NS and SKP noun inflection charts, there is the whole area of consonant gradation. One of the main problems with the traditional approach to word-types seems to be that word-types and consonant gradation are described and taught as if they did not affect the same words (see Chapter 8 for further discussion of this issue).

The issue of *i/e*-words is further confused by nominals with either an *e* or an *i* as the last vowel of the stem in at least one form of the paradigm, even when neither is the final vowel of the nominative (as in *puhelin* : *puhelime/n* 'telephone'; *suomalainen* : *suomalaise/n* 'Finnish'; *sormus* : *sormukse/n* 'ring').

In addition to *i/e*-words, words with a nominative-final consonant have complex paradigms. A large group are the *s*-words. Problems with them are cognitively very similar to those with *i/e*-words: it is not always possible to predict other paradigmatic forms on the basis of given forms. NS lists ten types of *s*-words; in SKP they are reduced to five by combining those where the differences are only stylistic or archaic. One of the types covers ordinal numbers, which are excluded here, and another is *mies* 'man', the inflection of which is unique. The remaining three types, however, are all common and include a large number of words:

(1) The *-s:-kse*-type (*ajatus* : *ajatusta* : *ajatuksen* 'thought') includes over 4000 lexemes and seems to be the most productive one, as words from other types tend to gravitate towards it. This is shown by an example from a radio announcer's *aamuhartauksen* (pro *-hartauden*, 'morning prayers', genit.sg.) or by *porsakset* (pro *porsaat*, 'piglet', nominat.pl., Dufva 1992, 64), and by many slang words such as *sarjis* : *sarjiksen* 'comics', or *koris* : *koriksen* 'basketball'.

(2) The *-s:-de*-type (*rikkaus : rikkautta : rikkauden* 'richness') is exceptional in also the partitive (*rikkautta* instead of **rikkausta*, which is the partitive formation of most other words which end in a consonant (see above). The 4,000+ words belonging to this group are originally names of properties and characteristics, derived from adjectives (*rikas* 'rich' > *rikkaus* 'richness') or nouns (*mies* 'man' > *miehuus* 'manhood'). Membership of this the type is thus based on productive derivation. Nearly 90% of the words in this group can be distinguished on phonological criteria, since they end in *-UUs*, a combination not found in the other groups of *s*-words (Karlsson 1982b, 205), but the remaining words have no phonological properties which would separate them unambiguously from the words in Group 1.

(3) The *-Vs:-VV*-type (*vieras : vierasta : vieraan* 'guest') contains about 750 words and is not productive, but many of the words are quite frequent.

(4) NS or SKP do not mention loan words and names ending in *-s* as a separate type. Instead, they are assigned to the *kalsium : kalsiumia* -type, as *csardas : csardasin* 'a Hungarian dance' or the *ajatus*-type, as *kustos : kustoksen* 'a professor who chairs a doctoral disputation'. For a learner, who is not always aware which words are loans, the *-s:-si* inflection is a fourth possibility for the *-s*-words.

In the plural (with the exception of the nominative), Groups 1 and 2 above collide for most forms (*ajatuksia — rikkauksia* but *ajatuksien/ajatusten — rikkauksien/*rikkausten*). Thus, plural forms alone do not contain enough information for type assignation. Forms of *-s* words can also be confused with other word-types: *kirves : kirveen : kirveitä* 'axe', cf. *perhe : perheen : perheitä* 'family'; *nainen : naista* 'woman' cf. *mies : miestä* 'man', etc. In short, as in the *i/e*-group, for the inflection of an *s*-word more information is needed than is contained in a single form.

Words with other final consonants in the nominative have similar features:

suomalainen : suomalaista : suomalaisen : suomalaisia 'Finnish'
puhelin : puhelinta : puhelimen : puhelimia 'telephone'
työtön : työtöntä : työttömän : työttömiä 'unemployed'
tytär : tytärtä : tyttären : tyttäriä 'daughter'
sammal : sammalta : sammalen : sammalia 'moss'

The *n*-words cause fewer problems than *s*-words since their paradigms are fairly predictable on the basis of the nominative, and most exceptions such as the superlative forms (*avain : avaimen* 'key' but *pahin : pahimman* 'worst') or numbers (*kahdeksan : kahdeksan* 'eight') are not included in this study. Words ending in consonants other than *s* or *n* are not numerous, and they will not be further discussed here.

The problems of plural stem formation usually involve the sound changes which occur as the plural marker *i* is combined with the stem. Words ending in O or U undergo simple combining:

talo : talo/j/a : talo/i/ssa 'house'
hylly : hylly/j/ä : hylly/i/ssä 'shelf'

The only learning problem here is the choice between the two shapes of the plural marker (*i/j*), with the *j* occurring between two vowels (see p. 195).

Learners have more problems with the vowel changes which affect the final vowel of two-syllable nominals ending in an *A*. The vowel choices are determined by phonological factors:

> (1) Words ending in an *ä* always drop the final vowel before the plural marker *i*.
> (2) Words ending in an *a* drop the final vowel, if the first vowel of the word is an *o* or *u*.
> (3) The word-final *a* changes into an *o* if the first vowel is an *a*, *e* or *i* (no other vowels are possible due to the vowel harmony constraint).

The existence of such rules means that the learning of these plurals does not need to be lexical, but the choice can be triggered by phonology. The rules in question, however, are complex and hard to employ in speech or even in writing. Furthermore, these rules are also unusual in that the first vowel of the word also matters, not only the end of the word. In addition to learning the rules it is necessary to learn an exception to the general strategy of paying attention to the word-final sounds.

The test data does not include polysyllabic nominals ending in *A*, nor did many occur in the spontaneous data. This group is large and includes many very common words (*ikkuna* 'window', *lusikka* 'spoon', etc.). The plural formation rules usually presented for this group are complex and involve such features as the part of speech (noun vs. adjective) (see F. Karlsson 1982b, 337–442; G. Karlsson 1978). As this group of words plays a very minor part in this study, they are not summarized here.

In actual learning situations L2 learners meet word-forms in a non-systematic way. For instance, there is no way of keeping learners from encountering local case forms before they know either the nominative or the genitive of the word in question. It is obviously both wasteful and impossible to tell them not to use new words before the paradigms have been properly presented in the classroom. Yet, if they do, they often make wrong assumptions about the other forms, which, at worst, leads into the fossilization of erroneous language. It is this problem of learning Finnish which this study focuses on.

Frequencies of nominal types

In most descriptions of Finnish morphology little attention is paid to the relative frequencies of the word-types. This misleads both the teacher and the learner since all types are presented as equally important, sometimes the rarest exceptions taking more space than the very frequent types. This is because the purpose of most studies is either to establish a complete picture of the nominal forms in a given variety of Finnish, or to instruct the native speaker. Both goals require concentrating on those features which little is known about.

The notable exception is F. Karlsson's thorough study of Finnish phonology and morphology, which lists statistics on practically every feature of Finnish sound and form structure (1982b). The bases of calculation for the numbers of individual words in each nominal type are the NS and the Reverse

Dictionary of Modern Standard Finnish by Tuomi (1980), which lists the NS material alphabetized from the end of the dictionary entries.[43]

Although the number of items of each word-type gives some indication of how important the type in question is to learn, the determining of the order in which the nominal types are presented to the learner cannot be based on these frequencies alone. Exceptional words are often very commonly used; it is because of their frequency that they can afford to stay exceptional and still be remembered correctly. A good example in Finnish is *mies : miestä : miehen : miehiä* 'man', which is uniquely inflected.

In addition to single exceptions, a word-type with few items can also have more occurrences in everyday speech than a type with a much larger number of items. A good example are the *i:e* words. In NS there are only 264 of them — as opposed to 8,559 *i:i*-words. The difference in current Finnish is even greater, since many of the *i:e* words listed in NS are no longer used, while the *i:i* group grows daily with new loan words. However, the *i:e* minority of less than three percent includes many very common words. Among the first 100 words of the Frequency Dictionary of Finnish (Saukkonen et al. 1979), there are 11 *i:e* words and no *i:i* words. Among the first 1000, there are 35 *i:e* words and 24 *i:i* words. Thus the simpler type clearly constitutes a minority of the most frequent words.

The input for a learner, however, does not normally equal the material of the Frequency Dictionary, which consists of newspaper and magazine articles and scripted radio speech. Most learners meet words of the *i:i* type, such as *posti* 'post office', *pankki* 'bank' or *hotelli* 'hotel', on their first day in the country, although the Frequency Dictionary would have us believe that these words are relatively rare. It is because of the lack of word frequency studies of spoken everyday Finnish that frequency calculations are not generally used as the basis for the curriculum in Finnish as a Second Language.[44]

Even if textual frequencies of input words are difficult to determine, calculations of items in each word-type do reveal something of the Finnish noun inflection. It can be estimated, for instance, that about 43% of all nominal paradigms in the singular contain no sound changes, i.e. endings can be added directly to the nominative. This figure is based on the statistics in Karlsson (1982b, 201) and his estimation that about 21% of Finnish words are subject to consonant gradation (1982b, 323)[45]. In addition, there is a large group of words

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[43]The NS includes material which is no longer in common use, but unfortunately statistics based on the newer SKP were not available at the time of writing.

[44]A notable exception is the teaching material developed by Hannele Branch in London.

[45]The following groups listed as separate types in NS have been excluded since their inclusion in NS is not systematic: comparative forms, superlative forms, ordinal numbers, past participle forms and derived adjectives ending in *-tOn*. This may mean that the percentage of words with no changes is slightly larger than 43%, since for instance all members of the *-tOn*-group are subject to consonant gradation, therefore reducing the consonant gradation percentage of other groups from the estimated 21%. Since all these figures are only gross estimates, however, the potential difference is not of great importance.

(7,332, 18%) ending in *-nen*, which are usually learnt early, since the members of the group are easy to recognize, and their inflection is uniform. With these two groups excluded, a good third of all Finnish nouns still remains: their paradigms contain either consonant gradation or other sound changes, which are not always predictable on the basis of the nominative alone.

Frequencies of the Finnish cases

Räsänen (1979) has calculated the frequencies of the Finnish cases both in written texts (including both fiction and non-fiction, the total number of nominal forms being 21,174) and in oral discourse (interviews with speakers of several dialects, 3,037 nominal forms). Since the oral sample is rather small, only the combined figures are presented in Table 2.

TABLE 2 (Räsänen 1979, 25). Frequencies of the Finnish cases in combined written and oral samples.

	sg.	pl.	total	%
nominative	6,288	1,481	7,769	32.1
genitive	2,428	646	3,074	12.7
accusative	—	—	1,724	7.1
nom. as acc.	339	333	—	—
gen. as acc.	1,010	—	—	—
-t	—	42	—	—
essive	452	70	522	2.2
partitive	2,810	1,323	4,133	17.1
translative	418	59	477	2.0
inessive	1,141	219	1,360	5.6
elative	788	208	996	4.1
illative	1,426	219	1,645	6.8
adessive	893	218	1,111	4.6
ablative	258	48	306	1.3
allative	476	152	628	2.6
abessive	44	0	44	0.2
comitative	—	33	33	0.1
instructive	188	100	288	1.2
prolative	9	—	9	0.04
lative	92	—	92	0.4
Total	19,102	5,109	24,211	100

Räsänen has not calculated the percentages of the cases separately for the singular and the plural. In Table 3 this has been done for the nominative, genitive, and partitive.

TABLE 3 Frequencies of the nominative, genitive and partitive cases in the singular and plural.

	singular		plural	
	n	%	n	%
nominative	6,288	32.9	1,481	28.9
genitive[46]	2,428	12.7	646	12.6
	3,438	18.0	—	—
partitive	2,810	14.7	1,323	25.9

The average frequency of all singular forms is 3.7 times that of the plural forms. The partitive singular, however, is only twice as common as the partitive plural, while the translative occurs seven times more often in the singular than in the plural.

There are no similar calculations available for contemporary spontaneous spoken Finnish — the form of language most needed by learners — but it is unlikely that the frequency rankings of usage between the cases would be totally different, although minor differences are likely to exist.

[46]The first line gives the number of the "real" genitives, the second line the combined number of "real genitives" and accusatives which have the genitive form.

4 DATA AND APPROACH

The usefulness, advantages and weaknesses of various types of data for the purposes of this study will be discussed in Section 4.1. The actual data are described in Sections 4.2.–4.4. Since the properties of the data and the method of the study are inevitably interlinked, the discussion in 4.1. also includes methodological statements, although I prefer to use the term *approach* for the various questions relating to the use of data. This is because of the eclectic nature of this study: anything that seems useful in achieving the aims of this study, whether it is borrowed from the traditional descriptions of Finnish, international SLA research, or elsewhere, will be utilized.

4.1 Approach to the data, from data to approach

The subject of this study is to analyze central aspects of the Finnish nominal inflection system from the viewpoint of learners' production problems. It is, therefore, learners' linguistic products that are the main source of information: they define what is central and what is particularly problematic.

There are two major requirements for linguistic data: they it should be as natural or authentic as possible and they should contain enough examples of the items under inspection. As a result of what Labov (1972, 209–210) has called the observer's paradox, speech and writing samples are seldom absolutely natural: a researcher's presence and the research subject's knowledge of being observed or recorded are likely to influence linguistic behaviour, while without the presence of a researcher, or some kind of organized collection method where the subject her/himself does the recordings, no data can be collected.

The problem is particularly acute in studies of variation or other sociolinguistic behaviour. In a study of a morphological system it is less likely to affect the results: no one speaker's products and no one communication

situation are of great importance for the study. It is conceivable that the speakers interviewed for this study display fewer morphological errors in their speech and writing when no teacher or researcher is going to hear or see their language and they feel more relaxed about it. It is equally conceivable that they produce just as many or even more morphological errors in such a "natural" situation, but are less self-conscious about them (not correcting them even when perceived, not stopping to try to find the correct form, etc.). Since it is the quality of the errors that is studied here and not their overall statistical frequency in an informant's production, this makes little difference.

It is conceivable that error frequencies within different morphological types might vary from one speech or writing situation to another, for instance that there would be more errors in the inflection of nouns ending in *-s* in speech situation 1, while in speech situation 2 errors in the nouns ending in *-e* would increase, independent of the rate of occurrence of words of these types in the two situations. However, I know of no evidence which would show this to be the case, nor can I see any intuitive reason for this kind of behaviour.

There is another statistical matter which is of importance here, however. Although the errors in this study are classified and analyzed by type, what is central in the morphological production system is also partly a matter of frequency: more errors are likely to occur affecting the tokens of a problematic frequent word-type than affecting tokens of an equally problematic but very rare type. A frequent word-type is therefore more central in the system. Similarly the production of a complex morphological phenomenon will be likely to involve more errors than that of a simple one, and will hold a more central position in the learning process for this reason. Close attention must therefore be paid to the interplay of the parameters of frequency and complexity. In this study, however, the problem is not approached by counting errors and correct forms within each type, but by analyzing the features of the morphological system of Finnish as to complexity and by focusing on the areas where errors concentrate.

Speech and writing obviously produce different kinds of data, involving different types and numbers of errors. The unlimited processing time for morphological production in writing means that the products better reflect the actual ability (or competence) of the learner than the morphological products in a speech sample, where the time pressure in processing is an additional factor.

Furthermore, pronunciation and spelling problems affect the products in different ways. In spoken language both the quantity and quality of sounds, intentionally or otherwise, can be made ambiguous in such a way that it masks morphological problems: if speakers are uncertain about some inflectional forms, they can pronounce them indistinctly. The quantitative aspects of Finnish phonology in particular offer abundant opportunity for this. In addition, learners often have difficulties in producing certain sounds, and it is impossible to determine, whether there was a morphological error or not, and if there was an error, what it was.

Conversely, the listener may interpret pronunciation problems as problems of inflection. Also, the inability to accurately interpret the phonological properties of Finnish input may lead to the acquisition of forms which seem

morphologically incorrect, even if the form is derived according to correct morphological principles.

It is not as easy to hide morphological problems by ambiguity in writing: one has to choose to write either *t* or *d*, *e* or *ee*, etc. Apart from bad handwriting, the reader has fewer problems of interpretation than the listener. On the other hand, it is not always possible to separate spelling errors from inflectional errors. Incorrectly interpreted spoken input (or misread input) can also be reflected in written language.

For the reasons outlined above, both spoken and written data are used in this study: they reflect different aspects of language production skills and to some extent cancel out each other's weaknesses. The mode of each example is shown by its code (see Section 4.4 and Appendix 3), and the effects of the mode, in greater detail than above, appear in the explanations of the examples.

In addition to questions relating to the observer's paradox, the use of statistical information, and the mode of the data, a choice must also be made between collecting continuous speech and/or written samples (hereafter referred to as spontaneous data) and having the informants produce test words or sentences (hereafter test data). In this study both are utilized because there is evidence that the distribution of grammatical variants in learner speech is sensitive to linguistic context (for an extensive discussion of this issue see Tarone 1988; Ellis 1994, 119–159).

Spontaneous data give a reasonably authentic general picture of the informants' ability to inflect nouns in speech and writing, but it has some drawbacks as far as more detailed examination goes:

> (1) Not all words and word-types occur in free discussions, certainly not frequently enough. This can be because these words or word-types are genuinely rare, but also because speakers have the very human tendency to avoid problems. Morphological difficulties result in code-switching (Martin 1989, 168) and in the use of paraphrases.
>
> (2) Not all forms are equally frequent. The singular forms outnumber plural forms by 3.7 to 1, and some cases are quite rare (Räsänen 1979, 25, see also 3.2.3).
>
> (3) In free conversation or writing speakers/writers only use words they know. Consequently, no information can be acquired about how new words are approached.

These problems can be avoided in tests, where the learner is forced to produce certain forms of words chosen by the researcher. Tests can also be designed to elicit information on only one aspect of language proficiency at a time.

The inherent disadvantage of test data is the unnaturalness of the language production situation: nobody normally goes around inflecting individual words which s/he has perhaps never seen before (and which may not even exist in the language). Even tests with full sentences or even longer texts are unnatural: normally one produces a sentence or a text with the language skills one has, taking alternate routes to the communicative goal if the first route runs into a morphological obstacle. In a test situation the word and the form are given by the researcher, leaving no escape routes. For most language learners, however, test tasks are more familiar than they are to native speakers of the target

language, since they resemble the exercises found in textbooks or used in the classroom. All the informants in this study, both those from whom the spontaneous data was collected and those who participated in the test described below, had had at least some formal instruction in Finnish. Thus the format of the test caused them no particular problems.

The third type of data employed in this study is interviews with some learners, where they were asked questions designed to probe their conceptions about producing Finnish inflectional forms. This data is referred to as introspection or interview data. Its methodological properties are discussed in Martin 1993c, and so this data will be only briefly described in 4.3.

The starting point in this study is global: the problems learners display in producing Finnish nominal forms. The ultimate goal is to reduce these problems, the immediate one to analyze and describe some central parts of the Finnish nominal inflection system in a way which makes sense of the production problems. Since it is both intuitively obvious and demonstrated by previous research (Martin 1990, 1992, Aalto 1991) that there are many reasons for these problems, some relating to the language itself, others to the learning process, yet others to general cognitive principles, no one methodology is sufficient.

Data has two functions in this study: the production problems of my students, as demonstrated by their speech and writing, have provided the topic. They have made me focus on certain areas of Finnish morphology which have then been examined in the light of several disciplines: general morphological theory, theoretical descriptions of the Finnish language, SLA models, and general cognitive principles. From each of these areas some ideas or models have been chosen as having explanatory potential for the performance of the learners. These models are then juxtaposed with the actual language data, and conclusions as to their suitability for the purpose or their explanatory power are drawn.

The approach may seem circular: from data to models to data. This is not the case, however, since the set of data from which the research problem arose is not the same set of data which is used in Chapters 5–7, although both represent similar learners (adults with secondary education with both a formal and informal language acquisition background — see Chapter 1). Furthermore, the focus of the study is on determining the model(s) with the greatest explanatory power, rather than on classifying a set of data. For these reasons I have not concentrated on any small homogeneous group of learners nor on just one L1 or only one type of language learning situation (only formal instruction or only natural acquisition), but have preferred to collect many kinds of material from a large group of learners. A model intended to be as general as possible must be based on data which provides examples of as many kinds of linguistic behaviour as possible.

4.2 Test data

To probe morphological production processes it is necessary to differentiate between new words and familiar words, since they are likely to be treated differently. Unknown words do not occur in spontaneous speech, so for the data on their inflection one must rely on tests. It is impossible, however, to know in advance which words are certain to be unfamiliar to all informants. The general level of language skills is not necessarily an indicator of the size and even less of the contents of the vocabulary: I have met foreigners who know the Finnish names for all fish, trees and mushrooms but have almost no verbs or lack basic household vocabulary. For this reason nonce words must be used to ensure that the required forms cannot be produced from memory.

The main aim of the test described here was to determine if the presence of a model word would aid in the inflection of unfamiliar (nonce) words. For this purpose a list of 60 words was devised. It consisted of 30 common nominals, very likely to be familiar to all subjects. The choice was based on the vocabulary of the most commonly used textbooks (such as Aaltio 1985, Hämäläinen 1988, Lepäsmaa & Silfverberg 1987, Nuutinen 1983). It was not compiled, for instance, on the basis of the Frequency Dictionary of Finnish, since the corpus used for this dictionary is quite different from the input that learners are likely to have. The 30 nonce words were formed by changing the first letter of each familiar word.

Since the pairing of each real word with its nonce word counterpart would have made the task too obvious, an alphabetical order was chosen. The list of nonce words was prepared before the list was alphabetized, in order to provide a random mixture of the two types of word. The result was that only one pair of words (*rilta — silta*) was not separated by other items in the list.

The nominals chosen for the test cover many common nominal types. The types with very few members (like *lapsi* 'child' or *mies* 'man') were excluded; so were those which only have members outside the domain of this study (for instance, ordinal numbers and participles). To study the influence of consonant gradation there are two representatives of certain types (*koulu — katu, perhe — osoite*[47]). A very large group of words excluded from the test are the nominals which have more than two syllables and end in a vowel. In particular, those ending in *-A* can be divided into types in so many ways that they could not be included in the test. However, they will be discussed in Chapter 7.

Even with these limitations, a fairly long list of words, doubled by their nonce counterparts, was required to get an overall picture of the learners' inflectional strategies. To keep the task manageable for the subjects, the number of forms that they were asked to write had to be kept to the minimum.

The nominative was chosen as the cue form for reasons given in 3.2.3. The genitive singular was selected because the genitive stem always differs from the

[47]The glosses for the test words are given in 5.5, where each individual word is discussed. They will not be repeated in other sections of this study.

nominative when any consonant or vowel changes occur in the singular paradigm. It is thus maximally informative about the subjects' ability to produce paradigmatic stem changes. Another alternative could have been a local case, for instance the inessive, which utilizes the same stem as the genitive. It would have had the advantage of providing more concrete images than the genitive: *koulussa* 'at school' is probably a cognitively more independent unit than *koulun* 'of school'. However, not all words are equally likely to be used in any given local case: *koulussa* is far more common than *kadussa* 'in a street', because of the nature of the referent, although *koulu* and *katu* per se are both very frequent lexemes. The genitive form in Finnish is used for so many semantic and grammatical functions that it occurs frequently, regardless of the meaning of the word. The results show that this aspect is even more important than was anticipated.

The partitive plural exemplifies most of the problems involved in plural declension. It was also chosen partly because of its frequency, which is clearly higher than that of other plural cases (see 3.2.3.), partly for the reasons stated above: the probability of occurrence of the local cases depends on the meaning of the word. Moreover, the partitive plural is also often the first plural form taught, apart from the nominative plural, which is based on a singular stem and thus not representative of the other plural forms. The partitive plural is also the form on which students are expected to base the other plural forms, and it is listed as one of the principal parts of nominals.

The subjects were asked to write the genitive singular and partitive plural form of each word. At the beginning of the test two sentences were given to show what the required forms were:

> Näen **talon.**
> Tuolla on paljon **taloja.**

There were also two example words (*luokka; olut*), whose required forms (*luokan* : *luokkia; oluen* : *oluita*) were completed on the form before the test with the teacher's assistance. The results show no signs of any of the informants not knowing what they were expected to do.

The test was administered by the regular Finnish teacher of each group, during class time. The instructions were given in Finnish on the test sheet and repeated by the teacher both in Finnish and in English or Swedish, depending on the language which was generally used in instruction. The students also had a chance to ask questions.

The subjects were not told that some of the words were not existing Finnish words. The instruction stated that some words would be familiar, while many would not. The informants were asked to write as rapidly as they could, and not to spend a long time pondering each word. Nevertheless, the slowest students spent about 40 minutes completing the list.

All 35 learner-subjects were adults participating in two courses of Finnish for Foreigners in the summer of 1992. The test form was completed by all students in the intermediate groups. The division into elementary, intermediate and advanced groups was based on self-evaluation, previous studies, and

interviews by teachers at the beginning of the courses. The subjects' level in Finnish was not measured by any independent tests.

The intermediate level was chosen on the assumption that the various word-types of Finnish would have been covered in their previous studies, which — on the basis of the interviews conducted after the tests (see 4.3) — was generally true. All informants had learned Finnish as adults, although some had occassionally heard it spoken as children. None spoke or had spoken Finnish at home, nor did their parents use Finnish as their common language. All informants had at least secondary education. One person had not participated in formal teaching before the course in question, but had acquired Finnish spontaneously during her two-year residence in Finland and was actually one of the most proficient speakers.

Learners were interviewed after the test. Several mentioned having noticed that many words in the list formed pairs. Some asked directly if all these words really existed. At this stage all subjects were told that half of the words did not exist.

The same word list with the same instructions was completed by 25 Finnish university students of social sciences and economics. The control group was not interviewed after the test. The results of the test group and the control group will be discussed in Chapter 5. The actual answers given in the test are available in Appendix 1.

4.3 Introspection data

Adult students bring to the classroom all their previous experiences and views about language learning and their impressions about themselves as language learners. They will also "seek to understand the nature of the system within which they should operate. If the teacher or teaching materials do not make this clear, the adult learner will seek systematic explanation elsewhere" (Rivers 1980, 56). This information and this zeal is rarely utilized in curriculum planning, and even less in research. This is at least partly due to the traditional view of learners as objects of teaching, rather than as adult subjects of learning.

Another reason for ignoring the explicit opinions of the students is that language learning is regarded as an unconscious process, of which the learner can have no knowledge (Stern 1987, xi–xii). The learners' comments may also seem too obvious, uninformed or unhelpful, or they may go against the teacher's approach to language learning (Fanselow 1987, x; Cohen 1987, 83). Within the cognitive framework of language learning, however, in which the learner is seen as an active subject, it is important that the learner and the teacher are aware of each others' positions towards language learning. Regardless of whether learners' views represent the most modern knowledge of how language is learned, they are likely to learn better if the teaching is in accordance with how they believe they learn best. It is also possible to discuss attitudes and notions which hinder learning if they are first made explicit.

In addition to teaching and curriculum planning, students' own descriptions of their learning and linguistic processes can and have been used as evidence in research. The perceived value of this type of data has suffered ups and downs in the history of psychology and linguistics during the past 100 years. It was first used by psychologists at the end of the nineteenth century, and its inherent qualities were also studied. In the behaviourist era it was rejected as totally unscientific, but the cognitive trends of recent decades have revived it. Its methodological characteristics in linguistics have been discussed for instance in Coulmas (1981) and in Faerch & Kasper (1987).

The usefulness of introspection data depends on the aims and methods of a study. One of the most serious problems in using introspective methods relates to memory. When a person tries to verbalize the strategy s/he has just employed, it is conceivable that memory structures other than the one actually used in the task are activated, particularly the ones which have been previously activated in similar tasks (Ericsson and Simon 1987, 41). In this study this is not an important problem, since the focus is on the strategies that the learners generally use, not those employed on any one occasion. On the contrary, the activation of earlier similar experiences was enhanced in the interviews by asking questions about how the learners usually perform in similar tasks.

In this study the stance is taken that language learning (like other cognitive processes) involves both conscious and unconscious processes, or both declarative and procedural knowledge (see 2.3). This view has been discussed for instance by Ericsson and Simon (1987), Grotjahn (1987) and Dechert (1987, 97). According to Dechert,

> Human information retrieval is partly declarative, and, as such, accessible for verbalization, and partly proceduralized and, therefore, not accessible for verbalization.

Ericsson and Simon (1980, 247), on the basis of their extensive methodological review, grant introspection an even more important role:

> – – verbal reports, elicited with care and interpreted with full understanding of circumstances under which they were obtained, are valuable and thoroughly reliable sources of information about cognitive processes.

In my view, however, language processing and learning is so multi-faceted that in practice it is virtually impossible to devise experiments which would reliably explore all these dimensions by introspection. This means that only a part of these processes can be accessed by introspection. Yet it can yield useful information about them. There is also evidence that students' beliefs about their language learning influence their learning. Students describe learning strategies consistent with their beliefs and what they believe influences how they go about learning a language. (Wenden 1987.) For a study of adults with a formal language learning background it is then important to include the view held by learners as well.

The aim of collecting introspection data for this study was to see whether learners can describe inflectional processes at all, and if they can, what kind of

views they have about them. The introspection was retroactive for the most part, although some informants thought aloud while working with the sample words. There was no attempt to probe procedural knowledge: all questions were aimed at eliciting information on the declarative knowledge of the nominal inflection possessed by the informants.

Introspection data were collected in the summer of 1992 from 18 of the 35 students who completed the test described in 4.2. Some of the informants came to the interview immediately after the test, some had to wait for their turn, but all were interviewed on the same day on which they took the test. All interviews were conducted and transcribed by the present writer. The informants spoke mostly in Finnish, but were encouraged to use English, Swedish or Norwegian when it was obvious that it was difficult or impossible for them to explain their strategies in Finnish.

The course of the interview was the same in all cases. There was a warm-up conversation, during which information about the language learning history of the informant was obtained (L1, other languages known, educational background, occupation, how and where Finnish had been learned). Then I asked if they had found the preceding test easy or difficult and how they had tried to find the required form if they had not known it offhand. Most informants found it difficult to explain this, so I asked what they usually did if they needed to use a word in a sentence and only knew the basic form. I gave them words to inflect which I expected to be unfamiliar to them (and which indeed turned out to be the case), and asked them to produce other forms and think aloud as they were doing this. At this point most informants started to volunteer information about their strategies, either for individual words or for learning the Finnish morphological system in general.

When the conversation seemed to be coming to an end, I asked the informants to read aloud eight sentences with gaps in them, with the required word in brackets and the case ending given. The sentences were very simple and the words familiar, such as *talo* 'house', *tyttö* 'girl', *joki* 'river', etc. Many informants either thought aloud or otherwise explained about their strategies as they read the sentences. Some read through the task fluently without stopping, and I asked them a few questions afterwards. Those who hesitated in reading were questioned after each sentence.

The conversations were transcribed and translated by the present writer. As it is the content of the extracts which is discussed, the translations do not include all the repetitions and hesitations of the originals. The Finnish of the learners is not always grammatically correct, and this has been conveyed in the translations of them.

The comments made by the learners can be divided into three groups: those concerning the Finnish language itself (easy, difficult, etc.), those pertaining to the learner's general language learning strategies, and those which more directly answered my questions about inflectional strategies. The latter will be discussed in Chapter 6. The other results, as well as some methodological questions, are presented in more detail in Martin 1993c.

4.4 The spontaneous data

The spontaneous data used in this study is from the corpus collected by the Finnish as a Second and Foreign Langugage Research Project (FSFL). This corpus consists of tape-recorded or videotaped conversations between native speakers and learners, sometimes with more than one learner present. In some recordings the speakers have been free to choose the subject of the conversation, in others they have been given a task to perform or a picture to describe. Some of the picture descriptions are recorded as a component of the tests for the National Certificate of Language Proficiency in Finnish. The corpus also includes written material from students of Finnish at the Jyväskylä University Language Centre. All the informants whose samples have been utilized in this study are adults with secondary education. The duration of the recordings is about 15 hours. The corpus and its description are available in Word Perfect -form on diskettes.[48]

The parts of the corpus used for this study were transcribed by the present writer or by research assistants of the FSFL project and checked by the present writer in doubtful cases. The transcription system is the one presented in A. Hakulinen (1989, 8), but as the present study focuses on morphology, the indicators of interactional aspects of the conversations have been removed for the sake of clarity. The examples have been transcribed at the phonemic level. The function of punctuation in the transcriptions differs from that of a normal text, with no capitalization and with commas indicating pauses and dots indicating ends of utterances. The same conventions have been followed in the translations. The original spelling of the learner has been retained in the written examples. In translations of these, the normal English spelling has been used.

The extracts have been coded for mode (oral/written), situation (interview/test), gender and L1. Each code is preceded by # to separate it from the other text. The codes are listed in Appendix 3. In one case the first language is indicated by o (other), even if known, since so few people with the L1 in question live in Finland that the identity of the speaker could easily be revealed. For the same reason, some identifying information has been replaced by – – in some examples. In a group recording the speaker is indicated only by an 0, since with many speakers it has not been possible to identify the speaker.

There are great differences between the speakers recorded for the FSFL corpus as to the frequency of morphological errors. Some seem to have almost none, some make them very often. This is partly due to the different stages of language learning which the informants represent: some have only been in Finland for a few months, some for several years. Some have studied Finnish extensively, some have little formal language learning background. The only group not represented are the speakers from the very early stages of language

[48]The corpus also contains short compositions by students in Swedish language schools from several areas in Finland. There are also classroom recordings with the aim of collecting the speech of the teachers, but which contain learner utterances as well. These have not been used in this study.

learning.[49] This is because the recordings are conversational situations and the informants were chosen so as to be able to communicate in Finnish sufficiently well to discuss at least some subject areas.

For the analysis in Chapter 7, I have collected all the morphological errors found in the FSFL corpus as defined above. The numerous errors which are syntactic in nature (morphologically correct form in the wrong sentence position) have been excluded; so also have those in which the error is not inflectional, e.g. *oregaana* pro *oregano, kaavi* pro *kahvi, oppielija* pro *opiskelija*. When these forms have been inflected and it is not possible to see whether the error is due to memory error in the stem or an inflectional error, they have been included (e.g. *esimereks* pro *esimerkiksi*).

[49]The FSFL corpus also contains some material from beginners and school-aged children, but this was not utilized in this study.

5 INFLECTION OF CONTEXT-FREE WORDS

The results of the test described in 4.2. will be discussed in this chapter. First, several hypotheses will be introduced. The tables of correct responses to real words and similar responses to nonce words will be presented in 5.1. Then, the figures reflecting the variability of answers will be presented in 5.2. The inflectional complexity of the test words in relation to each other will be discussed in 5.3. The general level of difficulty of the test, defined in terms of missing and inappropriate answers will be discussed in 5.4. Finally, the test responses will be discussed in detail, word by word, in 5.5. Conclusions will be presented in 5.6.

When designing the test I formulated the following hypotheses:

1) Real, familiar words will produce more correct answers than nonce words.

2) There will be more correct answers for the genitive singular than for the partitive plural.

3) Nonce words will produce a greater number of different answers than real words.

4) There will be a greater number of different answers for the partitive plural than for the genitive singular.

5) The morphophonological complexity of the word will determine the ranking of the words, in terms of the number of correct answers.

"Correct answer" for a nonce word is here defined very narrowly as an answer which is similar to the correct answer for the corresponding real word in all respects except for the initial letter, by which the given nominatives differ, and the potential consequences for vowel harmony, which follow from the difference in the nominative. These answers are called rhyming answers. As one aim of the test was to see if the availability of an analogical model will help in inflection, analogy is here, as opposed to other parts of this study, also understood in a narrow sense, as proportional analogy.

Responses will be counted as "different answers" if they differ in any way, even if the differences bear no morphophonological significance (such as spelling errors in the given stem).

The morphophonological complexity of a word is defined as meaning the number of graphemic[50] changes in the stem between the given nominative and the requested form (genitive singular/partitive plural). Thus a word like *koulu* is maximally simple, as there are no stem changes, while *onneton,* for instance, is at the other end of the continuum, with both consonant and vowel changes of many kinds. Each elision, addition and change of a phoneme is counted as one change. Below the real test words are listed in an ascending order of complexity.

1. No stem changes:

koulu : koulun : kouluja

2. No stem changes in the singular, one in the plural:

laiva : laivan : laivoja
päivä : päivän : päiviä
tuoli : tuolin : tuoleja

3. One stem change in the singular, none in the plural:

katu : kadun : katuja
keitto : keiton : keittoja
perhe : perheen : perheitä
tauko : tauon : taukoja

4. One stem change in the singular, one in the plural:

jalka : jalan : jalkoja
kampa : kamman : kampoja
kauppa : kaupan : kauppoja
kenkä : kengän : kenkiä
kukka : kukan : kukkia
leipä : leivän : leipiä
lyhyt : lyhyen : lyhyitä
nimi : nimen : nimiä
silta : sillan : siltoja
vieras : vieraan : vieraita

5. Two or more stem changes in the singular, one in the plural:

avain : avaimen : avaimia
isompi : isomman : isompia
järki : järjen : järkiä
kauneus : kauneuden : kauneutta
kerros : kerroksen : kerroksia
osoite : osoitteen : osoitteita

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[50]For the purposes of this test, phonemes in Finnish are isomorphous with graphemes.

poika : pojan : poikia
puhelin : puhelimen : puhelimia
vesi : veden : vesiä

6. Two or more stem changes in the singular, two or more in the plural:

nainen : naisen : naisia
onneton : onnettoman : onnettomia
opas : oppaan : oppaita

The outcome of the test in relation to Hypotheses 1 and 2 will be discussed in 5.2, and to Hypotheses 3 and 4 in 5.3. Hypothesis 5 is examined in 5.4.

Although some of the test results have been quantified, statistical measures are used very sparingly. In addition to cross-tabulations and calculations of some mean values, the statistical significances of the results relating to the hypotheses above have been calculated (t-tests for Tables 6, 8—11, correlations for Table 14, chi-square tests for Tables 15–17). The main aim of the test, however, was not to collect data for statistical conclusions about the learners' ability to inflect certain words — which would demand a much larger population and several independent instruments for reliable results — but to sample the overall morphological relations of various word structures at the intermediate level of acquisition of Finnish. Thus a major part of the analysis is the qualitative discussion of individual test words.

5.1 Correct responses and their rhyming counterparts

In a nonce-word test it is somewhat problematic to determine which answers can be considered "correct" or even feasible. Potentially, this is a problem for existing words as well, as many Finnish nominals have several variants of one paradigmatic form, particularly in the plural. However, in the test in question words were chosen so that they only have one possible genitive singular and partitive plural form each, i.e. one correct answer. This was confirmed by the results of the Finnish control group: apart from minor dialectal variation (see *tuoli* in 5.5), variable responses to the real words were not a problem. The few answers which were considered incorrect were other forms of the same paradigm (e.g. partitive singular instead of partitive plural).

The inflection of the nonce words by the learners produced a great variety of answers, and it turned out to be impossible to draw a line between correct and non-correct answers, particularly since there is little previous information about the behaviour of Finns in a similar task (see, however, Leskinen 1981, Yli-Vakkuri 1976). To study the limits of production of a comparable population of Finns, a control group was tested. The overall result was that the variety of nonce word-forms was not drastically smaller among the Finns than it was among the learners. Since numerous factors seem to influence the responses, the quantity of this variety is presented in 5.2, and described word by word in 5.5. The figures in the tables of this chapter only refer to the numbers of the

answers which are "correct" in the sense of being a rhyming[51] pair of the real word. In other words, they reflect the ability or willingness of the subjects to employ model words in their production in this task, or else their ability to apply the same set of rules or other means of morphological production in both cases. From the perspective of the language system the figures below reflect the degree to which the various word-types are seen as productive categories. The percentages of the correct answers for the real words are listed in Table 4 and the percentages of the rhyming answers for the nonce words in Table 5.

TABLE 4 Percentages of correct answers for real words.

	gen.sg.	(%)	part. pl.	(%)
	test group (N=35)	control group (N=25)	test group (N=35)	control group (N=25)
avain	51.4	96.0	34.3	96.0
isompi	20.0	84.0	60.0	100.0
jalka	62.9	100.0	48.6	100.0
järki	25.7	96.0	31.4	76.0
kampa	57.1	100.0	31.4	100.0
katu	68.6	100.0	57.1	100.0
kauneus	11.4	100.0	22.9	80.0
kauppa	77.1	96.0	48.6	100.0
keitto	65.7	100.0	51.4	92.0
kenkä	54.3	100.0	57.1	100.0
kerros	45.7	100.0	37.1	100.0
koulu	91.4	100.0	65.7	100.0
kukka	74.3	100.0	60.0	96.0
laiva	97.1	100.0	48.6	100.0
leipä	77.1	100.0	48.6	96.0
lyhyt	45.7	100.0	17.1	96.0
nainen	74.3	100.0	60.0	100.0
nimi	65.7	100.0	40.0	96.0
onneton	14.3	96.0	17.1	100.0
opas	17.1	96.0	22.9	96.0
osoite	17.1	100.0	14.3	100.0
perhe	51.4	100.0	60.0	100.0
poika	85.7	92.0	57.1	100.0
puhelin	48.6	96.0	31.4	100.0
päivä	82.3	100.0	65.7	100.0
silta	54.3	100.0	37.1	100.0
tauko	37.1	100.0	45.7	100.0
tuoli	65.7	100.0	34.3	64.0
vesi	71.4	100.0	40.0	84.0
vieras	42.9	100.0	48.6	96.0
Total	55.1	98.4	43.1	95.5

[51]The term *rhyming* may not be totally appropriate here as the words were not presented as pairs. However, it was chosen because it only describes the product, without reference to any particular method of production.

The overall success rate for the learners, including both forms, is 49.1%, for the control group 97.0%. In other words, the learners at the intermediate level have mastered about one half of the inflectional system of the native speakers, as measured in the terms of this test.

The genitive singular errors of the control group are mainly orthographic or dialectal (*avaimmen* pro *avaimen, poijan* pro *pojan*). The partitive plural errors also include partitive singular forms for non-countables (*vettä* pro *vesiä, kauneutta* or *kauniita* pro *kauneuksia*) and dialectal forms (*lyhyviä* pro *lyhyitä, tuolia* pro *tuoleja*). In addition to such errors there is one which may reflect a potential trend for change in the system: *opaksia* pro *oppaita* (see 3.2.3). In some cases it does not seem to be clear even to native speakers how to form a plural for a word which is rarely pluralized: *järki* produced four different partitive plural forms.

The responses by the learners show a great deal of variation between individual words, from 97% of correct genitive singular answers for *laiva* to 11% for *kauneus*. Some of the learners' errors are similar to those produced by the control group: orthographic errors or choices of wrong forms. Whether they are products of an incomplete knowledge of the system or slips of the pen is impossible to judge. There are, however, a great many errors which clearly show that the learner in question has not yet achieved control over the Finnish nominal inflection. These will be discussed in more detail in 5.5.

TABLE 5 Percentages of rhyming answers for nonce words.

	gen.sg. (%)		part. pl. (%)	
	test group (N=35)	control group (N=25)	test group (N=35)	control group (N=25)
asaite	8.6	12.0	8.6	12.0
enneton	11.4	64.0	11.4	72.0
halka	34.3	36.0	22.9	32.0
hesi	42.9	32.0	37.1	68.0
hieras	37.1	80.0	40.0	76.0
härki	0	36.0	48.6	72.0
ipas	17.1	44.0	11.4	28.0
ivain	31.4	80.0	22.9	72.0
jampa	31.4	20.0	31.4	88.0
kainen	51.4	52.0	28.6	48.0
käivä	68.6	96.0	42.9	96.0
leitto	68.6	96.0	60.0	100.0
lerros	37.1	92.0	31.4	92.0
limi	40.0	40.0	28.6	56.0
muoli	42.9	56.0	2.9	22.0
osompi	11.4	68.0	54.3	92.0
patu	42.9	32.0	51.4	100.0
pauko	20.0	20.0	31.4	80.0
poulu	77.1	96.0	45.7	96.0
pukka	71.4	100.0	42.9	88.0

	gen.sg. (%)		part. pl. (%)	
	test group	control group	test group	control group
pyhyt	37.1	72.0	20.0	76.0
raiva	80.0	100.0	25.7	48.0
reipä	40.0	60.0	34.3	88.0
rilta	48.6	60.0	34.3	100.0
tauneus	5.7	88.0	28.6	88.0
tauppa	77.1	92.0	31.4	96.0
tenkä	42.9	80.0	42.9	84.0
terhe	37.1	80.0	31.4	72.0
toika	31.4	20.0	51.4	52.0
tuhelin	37.1	84.0	22.9	92.0
Total	39.4	62.9	32.6	73.2

The learners produced a rhyming genitive singular form nearly 40% of the time, while the rate for the control group was almost 63%. Rhyming answers for the partitive plural were less frequent with the learners (32.6%), but more frequent with the control group (73.2%). The reason for this is obvious: as the learners did not often know the appropriate partitive plural form of the corresponding real word, they could not possibly use it as a model, the way the Finns could, while the genitive singulars of the real words were more familiar to the learners, and therefore more reliable models. The overall percentage of the rhyming forms for the learners was 36.0%, for the control group 68.1%.

At the beginning of the test some efforts to interpret the nonce words as existing words can be seen among the Finns (for example, reading *asaite* for *ansaite* and *härki* for *härkin*, see 5.5). Nevertheless, it is likely that the native speakers soon noticed that many of the words did not exist and that they were rhyming pairs of the real words. Even so, only about two-thirds of their nonce forms rhyme with the real word-form.

In Table 6 the answers for the real words and nonce words are compared to test the first two hypotheses presented at the beginning of this chapter.

TABLE 6 Percentages of correct/rhyming answers to real words and nonce words.

	gen.sg. (%)		part. pl. (%)	
	test group (N=35)	control group (N=25)	test group (N=35)	control group (N=25)
real words	55.1	98.4	43.1	95.5
nonce words	39.4	62.9	32.6	73.2
all words	47.3	80.7	37.9	84.3

The table shows that if the "correct" answer for a nonce word is defined as a rhyming answer, both groups did significantly better with real, familiar words than with structurally very similar nonce words ($p < 0.001$ for both groups and both forms), as predicted in Hypothesis 1. This indicates that a great deal of morphological processing is lexically controlled.

There are, however, several words in the list which have more than one potential inflectional model if they are sought outside the list of test words, as the testees naturally would. However, it is not possible to draw up a list of all potentially correct answers for the nonce words by resorting to such outside models. This is because to do so one would have to determine the limits for analogy (see further in 5.6). As long as they are not explicitly established, Hypothesis 1 cannot be confirmed, if correctness is to be given any but a very limited interpretation.

Hypothesis 2, that there will be more "correct" (i.e. rhyming) answers for the genitive singular than for the partitive plural, is confirmed for learners by Table 6, both for real words ($p < 0.001$) and for nonce words ($p < 0.001$). For the control group, the difference between the two forms of the real words is not statistically significant, while the difference for the nonce words is significant ($p < 0.05$), but not of the kind predicted by Hypothesis 2. In other words, the Finnish group was more insecure about the genitive singular forms of the nonce words than of the partitive plurals. This is partly due to the words ending in *i*, which were produced as either *i*- or *e*-stemmed in the singular but often collapsed to the partitive of *e*-stems in the plural (e.g. *hesi* : *heden/hesin/hesen* : *hesiä*).

The interpretation of these results as to the usability and usefulness of proportional analogy as an inflectional strategy depends in many ways on the interpretation of the other responses given in the test. These will be discussed in 5.5, and the conclusions from the test as a whole will be drawn in 5.6.

5.2 Variability of test responses

The numbers of correct and rhyming answers provide information about how difficult the task as a whole was for the subjects and how well they were able to handle the Finnish nominal inflection system. Another quantitative way to look at the results is to examine how many different responses each word produced. Together with the information in 5.5 they provide a basis for conclusions about the inflectional complexity of various nominal types.

The variability of the answers can be calculated in more than one way. The most obvious is to look at the number of answers which differ from each other in any way, however minor the difference. The first two columns in Table 7 present this data.

The figures in the two columns on the right represent variation, from which all answers given by only one informant have been removed. This has been done because some variation seems clearly accidental and adds nothing to

a study of inflection. The excluded forms are often misspellings of the type, where dots are missing over an *ä* or *ö*, a *j* has been added (*vesijä* pro *vesiä*) or replaced by an *i* (*poian* pro *pojan*), and other similar errors. Nonetheless, many of the forms produced by one person only are inflectionally interesting. They will be discussed in 5.5.

Both the overall variation and the modified figures are necessary, since an answer given by only one person cannot be reliably classified. It may be a slip, or it may be a random guess by a subject who finds the task overwhelming but wants to complete the questionnaire. It can also be an example of genuine morphological processing based on solid knowledge of the system, and, in an extreme case, even the only correct answer to a difficult task. With the exception of the correct answer for a real word, it is impossible, however, to judge which of the forms offered by only one person fall into each category.

The real words and nonce words are listed together, since the figures reflect the possibilities for the variation which each word has, regardless of whether it is familiar or not. Each real word and nonce word is listed as a pair, alphabetized by the real word. The crucial factor behind the results presented in 5.1 was the difference between knowing the word (and thus presumably its inflection), as opposed to having to inflect words which have never been heard before. Here the emphasis is on the number of the inflectional possibilities that each phonotactic string has in the learners' mind.

TABLE 7 Numbers of different responses given by the test group (N = 35). Columns 1 and 2: total number of answers. Columns 3 and 4: number of answers given by at least two subjects.

	1 gen. sg.	2 part. pl.	3 gen. sg.	4 part. pl.
avain	8	18	3	4
ivain	9	14	3	4
isompi	16	10	4	1
osompi	12	9	5	1
jalka	7	8	3	3
halka	5	16	3	3
järki	9	11	5	2
härki	10	9	6	4
kampa	5	11	2	3
jampa	5	9	3	2
katu	3	10	2	3
patu	5	6	2	2
kauneus	12	14	5	4
tauneus	8	16	5	3

	1 gen. sg.	2 part. pl.	3 gen. sg.	4 part. pl.
kauppa	2	9	2	3
tauppa	2	8	2	2
keitto	5	7	2	2
leitto	4	8	2	2
kenkä	6	11	2	2
tenkä	9	12	2	2
kerros	11	11	4	2
lerros	8	12	3	3
koulu	4	5	1	1
poulu	5	6	1	1
kukka	4	11	2	2
pukka	3	10	2	3
laiva	2	9	1	2
raiva	4	9	3	4
leipä	2	12	2	3
reipä	7	15	3	2
lyhyt	6	13	3	2
pyhyt	7	10	3	3
nainen	5	8	1	1
kainen	8	14	3	5
nimi	6	10	2	3
limi	4	10	2	3
onneton	12	14	5	3
enneton	13	16	5	5
opas	11	13	4	3
ipas	12	14	5	6
osoite	6	17	5	5
asaite	5	16	4	6
perhe	4	9	2	1
terhe	4	12	2	3
poika	3	11	2	2
toika	7	12	3	2
puhelin	9	14	5	4
tuhelin	9	10	5	3
päivä	5	7	1	2
käivä	8	9	2	4

	1 gen. sg.	2 part. pl.	3 gen. sg.	4 part. pl.
silta	5	13	3	3
rilta	8	12	3	3
tauko	9	9	2	3
pauko	5	8	2	4
tuoli	4	8	2	2
muoli	4	9	2	2
vesi	6	7	3	1
hesi	5	12	3	3
vieras	6	13	4	2
hieras	8	9	4	6

It is clear that there was a large number of answers given by just one person. Once these are removed, there is total agreement on the inflection of the words *koulu, poulu* and *nainen.* In addition, genitive singulars are limited to one for *laiva* and *päivä,* and partitive plurals for *isompi, osompi, perhe* and *vesi.* The greatest number of different answers given by at least two persons is six (*asaite, hieras, härki, ipas*).

Generally, more plural than singular forms have been suggested. Exceptions to this are the words *härki, isompi* and *osompi,* which have more singular than plural forms, and *kerros* and *tauko,* for which the numbers are equal.

In the tables below the number of the answers given for the real and nonce words, and genitive singular and partitive plural respectively, are compared. In Table 8 the figures are taken from Columns 1 and 2 in the above table, in Table 9 from Columns 3 and 4.

TABLE 8 Total number of different responses given by the test group (N=35; $\bar{x}$ = average number of forms/word).

	gen.sg.		part.pl.		both forms	
	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$
real words	193	6.4	324	10.8	517	8.6
nonce words	203	6.7	332	11.1	535	8.9
all words	396	6.6	656	10.9	1052	8.8

Table 8 shows that the differences between the real and nonce words are minor, and statistically insignificant, although they are consistently in the same direction. Thus, Hypothesis 3 (nonce words will produce a greater number of different answers than real words) is not supported.

The number of different genitive singular forms is significantly lower than the number of partitive plural forms both for real and for nonce words ($p < 0.001$), as was predicted by Hypothesis 4.

TABLE 9 Numbers of different responses given by at least two subjects of the test group (N=35; $\bar{x}$ = average number of forms/word).

	gen.sg.		part.pl.		both forms	
	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$
real words	84	2.8	74	2.5	158	2.6
nonce words	93	3.1	96	3.2	189	3.2
all words	177	3.0	170	2.8	347	2.9

When all answers given by just one informant are excluded, the trends change: relatively, the difference between the real words and nonce words grows, while the difference between the genitive singular and the partitive plural disappears. The latter is due to the exclusion of the partitive plural answers given by only one person, as the sheer length of the partitive plural formative gives conciderable opportunity for variation.

The difference between the nonce and real words is statistically significant both for the genitive singular ($p < 0.05$) and for the partitive plural ($p < 0.01$) and thus supports Hypothesis 3 in that once answers given by only one person are ignored, the patterns of variation begin to emerge among the nonce words. Many learners simply knew the correct answer for the real words, and the guesses, by those who did not, constitute a smaller fraction of the total of the answers for the real words than for the nonce words, which do not really have one correct answer.

For comparison, the overall variability for the control group is presented below in Tables 10 and 11, which correspond to Tables 8 and 9 above for the learners. The complete list of the numbers of answers on which these tables are based is in Appendix 2.

TABLE 10 Total numbers of different responses given by the control group (N=25; $\bar{x}$ = average number of forms/word).

	gen.sg.		part.pl.		both forms	
	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$
real words	42	1.4	48	1.6	90	1.5
nonce words	92	3.1	121	4.0	213	3.6
all words	134	2.2	169	2.8	303	2.5

The differences between the real and nonce words are very significant ($p < 0.001$), while the difference between the genitive singular and partitive plural is significant for nonce words ($p < 0.05$), but not for real words.

The variability of the responses of the control group is far smaller than that of the test group. Although some individual nonce words (*asaite, enneton, härki, kainen*) produced a great variety of different answers by the Finns and by the learners, the overall average of answers per word is more than three times higher for the learners. This clearly reflects the learners' incomplete control of the limits of the inflectional system. For the real words the difference of the averages is even higher (1.5 for Finns, 8.6 for learners).

TABLE 11 Numbers of different responses given by at least two subjects of the control group (N=25; $\bar{x}$ = average number of forms/word).

	gen.sg.		part.pl.		both forms	
	n	$\bar{x}$	n	$\bar{x}$	n	$\bar{x}$
real words	30	1.0	32	1.1	62	1.0
nonce words	63	2.1	60	2.0	123	2.1
all words	93	1.6	92	1.5	185	1.5

When misspellings and idiosyncratic or dialectal one-time answers are removed, the differences between the real and nonce words remain significant ($p < 0.001$), but the differences between the two forms are not significant.

As can be expected, the Finns are in almost total agreement on the real words. The only two words for which an alternative partitive plural was produced by more than one person were *järki* (*järkiä/järkejä*) and *tuoli* (*tuoleja/tuolia*). Also, for the nonce words the alternatives stabilized at an average of two, while the learners averaged about three alternatives in the corresponding count.

5.3 Order of difficulty of the test words

The relative order of the test words, based on the percentage of "correct" answers, will be listed and discussed in this section. Several disclaimers concerning the term "correct" were presented in 5.1. Nevertheless, the figures are used here since no other clearcut indicator of correctness can be postulated. The words most affected by the definition of correctness are individually considered. The ranking of the words must not be considered absolute, as the differences in the percentages are often small. The words are therefore discussed in terms of small groups which share certain features, even if they do not appear exactly next to each other in the list.

The order of difficulty is first presented for the genitive singular forms (Table 12), then for the partitive plural forms (Table 13). Finally the figures are combined (Table 14) for a comparison with the hypotheses underlying the test. The combining has only been done for the real words, as the hypothesis for the order of difficulty was proposed for the real words only.

TABLE 12 Ranking of the test words by percentage of "correct" genitive singular responses by the test group (N=35).

Real words		Nonce words	
laiva	97.1	raiva	80.0
koulu	91.4	poulu	77.1
poika	85.7	tauppa	77.1
päivä	82.3	pukka	71.4
kauppa	77.1	leitto	68.6
leipä	77.1	käivä	68.6
nainen	74.3	kainen	51.4
kukka	74.3	rilta	48.6
vesi	71.4	muoli	42.9
katu	68.6	patu	42.9
tuoli	65.7	hesi	42.9
keitto	65.7	tenkä	42.9
nimi	65.7	limi	40.0
jalka	62.9	reipä	40.0
kampa	57.1	tuhelin	37.1
kenkä	54.3	pyhyt	37.1
silta	54.3	lerros	37.1
avain	51.4	terhe	37.1
perhe	51.4	hieras	37.1
puhelin	48.6	halka	34.3
kerros	45.7	jampa	31.4
lyhyt	45.7	ivain	31.4
vieras	42.9	toika	31.4
tauko	37.1	pauko	20.0
järki	25.7	ipas	17.1
isompi	20.0	enneton	11.4
opas	17.1	osompi	11.4
osoite	17.1	asaite	8.6
onneton	14.3	tauneus	5.7
kauneus	11.4	härki	0

For the genitive singular formation the easiest words are two-syllable words with no consonants subject to consonant gradation (*laiva, koulu, päivä*). Next are the words with simple consonant gradation (*kauppa, leipä, kukka, katu, keitto*) and words of high frequency with more substantial changes of the stem shape (*poika, nainen, vesi*). The very familiar *tuoli*, which actually is as easy as *koulu*, is much further down in the list, together with *nimi*.

The words containing a combination of two different consonants subject to gradation are in the middle of the list (*jalka, kenkä*, etc.). Next are the ungraded *-in:-ime* words and the *-e:-ee* words. Both contain regular but memory-taxing

stem changes. Next comes *kerros*, the *-s* word of the most productive type, with the other *-s* words following in the order expected: first, *vieras*, the *-s:-Ø*-type without consonant gradation, next *opas*, which adds the gradation, and finally *kauneus*, which is semantically abstract and contains the largest number of paradigmatic changes.

The word *lyhyt*, which belongs to a type with very few words and is therefore a good candidate for lexical acquisition, is about on par with the first *-s* words. Below them are the words with *-rk-:-rj-* and *-k-:-Ø*-alternations (*järki*, *tauko*), whose phonological shape is altered more by consonant gradation than that of most other words. Comparative inflection (*isompi*) is complex, and may not have been learned at all by many subjects at the time of the test. At the bottom of the list is also an *-e:-ee* word with reverse consonant gradation and a caritive adjective.

Morphophonemic alternations appear to account for the order of difficulty, except for the most common words: *poika*, whose genitive has an exceptional consonant variant and is likely to have been memorized, and *nainen*, which exemplifies a type which is extremely frequent at the early stages of learning Finnish (see 7.1.3). Another example of the effect of frequency is *vesi*, which in teaching materials is often used as the model word for its type.

Consonant gradation can be divided into three categories as to difficulty. The easiest are the quantitative changes together with the qualitative changes of the type *t:d* and *p:v*. Next are the combinations of two consonants, and finally the changes involving *k*, where the shape of the word changes (similar results were found in the language of American Finns, Martin 1989, 171–183).

The number of alternations is also significant: the representatives of the types with most changes are the furthest down on the list. Reverse consonant gradation combined with other changes accounted for most of the problems, as well as the unusual *-s:-d* alternation of *kauneus*.

With familiar words memorization of the genitive form is always a possibility. Not so with nonce words: for their inflection either a model, a set of rules, or some other processing method must be employed. However, there is no way of proving that the test word-forms containing no or simple regular phonemic changes were produced by any given process. One could, for instance, look at *kainen* and remember the rule that words ending in *-nen* change the second last *n* to *s*, or one could compare it to *nainen* and inflect *kainen* to rhyme with it. In a written test with sufficient time, both strategies can conceivably be used for even the most complex words, provided that the learner has memorized all the necessary rules, their hierarchical order, and the constraints of application.

Comparison of the lists of the real and nonce words indicates that the similarities between the two lists are greater than the differences. In terms of what was presented above, both lists have the major groups of words in the same order. There are some noteworthy exceptions, however. The word *poika* is near the top of the list, while *toika* is towards the end. This can be seen as evidence for the lexicalization of the forms of *poika*. A similar but smaller difference pertains to *leipä* and *reipä*, *jalka* and *halka*, as well as *kampa* and *jampa*: the familiarity of the word has increased the chances of consonant gradation. It

is also possible that some of the learners recognized nonce words as such and knew that novel words are not always subject to gradation.

The words *keitto* and *leitto*, like *kerros* and *lerros*, and *lyhyt* and *pyhyt*, seem to be far apart, but the actual percentages of correct inflection are fairly similar. The very last items on the list clearly suffer from the low percentage of correct answers for the real words: most subjects simply did not know how to inflect the word-type.

TABLE 13 Order of the test words by percentage of the "correct" partitive plural responses of the test group (N=35).

Real words		Nonce words	
koulu	65.7	leitto	60.0
päivä	65.7	osompi	54.3
perhe	60.0	patu	51.4
kukka	60.0	toika	51.4
nainen	60.0	härki	48.6
isompi	60.0	poulu	45.7
poika	57.1	käivä	42.9
katu	57.1	pukka	42.9
kenkä	57.1	tenkä	42.9
keitto	51.4	hieras	40.0
laiva	48.6	hesi	37.1
jalka	48.6	reipä	34.3
kauppa	48.6	rilta	34.3
leipä	48.6	jampa	31.4
vieras	48.6	lerros	31.4
tauko	45.7	pauko	31.4
vesi	40.0	tauppa	31.4
nimi	40.0	terhe	31.4
kerros	37.1	kainen	28.6
silta	37.1	limi	28.6
avain	34.3	tauneus	28.6
tuoli	34.3	raiva	25.7
puhelin	31.4	halka	22.9
kampa	31.4	ivain	22.9
järki	31.4	tuhelin	22.9
opas	22.9	pyhyt	20.0
kauneus	22.9	enneton	11.4
lyhyt	17.1	ipas	11.4
onneton	17.1	asaite	8.6
osoite	14.3	muoli	2.9

The reasons for the ranking of the real words are less clear for the partitive plural forms than for the genitive singular forms. The overall success rate is lower, as was expected (55.1% vs. 43.1%, see Table 6). If the formation of the partitive plural is considered to be independent of the other forms of the paradigm, i.e. if the partitive plural were formed on the basis of the nominative alone, it would be expected that the words which employ the default procedure would be the easiest: no changes within the stem, plural marked with an *i*, and

partitive with *A*. Not surprisingly, *koulu+i+a* is at top of the list, but so is *päivä* > *päiviä*, which loses the stem vowel, while *katu+i+a*, *keitto+i+a* and *tauko+i+a* are further down although they do not differ from *koulu* in any way, as far as the partitive plural form is concerned.

At least two explanations can be provided for the above results. The fact that *i* changes to *j* between two short vowels increases the memory load, comparable with the loss of the final vowel, bringing the *kouluja* type on par with *päiviä*, as far as complexity is concerned. The two-syllable nominals ending in an *-A* which change the vowel (*laivoja, jalkoja, siltoja, kampoja*) are generally located further down the list than the ones which drop the stem vowel, suggesting that the vowel change is a slightly more complicated phenomenon than the loss of it.

Another explanation for the order is that *katu, keitto,* and *tauko* all include a consonant subject to gradation. Even if gradation is not applied in the partitive plural of these words, having to consider the possibility may have lessened the chances of success. Also *kukkia, poikia, kenkiä* and *leipiä* have proven to be more difficult than *päiviä*, although the surface differences between the given nominative and the partitive plural are the same.

The lay-out of the test may have affected the results here, with the nominative given on the left, the space for the genitive singular in the middle, and the space for the partitive plural on the right side of the page. Had the nominative been in the middle, with the other forms on both sides of it, the genitive might have had less influence on the partitive plural results. However, the nominative — genitive — partitive order is used in many teaching materials, and it may have aided recollection of the teaching contexts in which the words had been previously encountered.

A particularly striking example of consonant gradation affecting inflection is the difference in the success rates between *perhe* and *osoite* and, to a slightly lesser extent, between *vieras* and *opas*. Both are examples of reverse gradation.

As compared with the genitive list, *isompi* is much higher on the partitive list. This is clearly connected with the internal complexity of the word-type: *isompia* can be guessed, as it is a prototypical partitive plural form, while *isomman* must be known. The result would seem to go against the suggestion above — consonant gradation has not affected the success rate in this case — but this is due to the low number of correct answers in the genitive singular: to many subjects the inflection of this word-type is totally unfamiliar.

The well-known *vesi* and *nimi* are below the middle of the list, probably because the correct plurals resemble partitive singulars of other word-types, and many subjects have tried to avoid this perceived similarity, either by using an *e*-stem or by adding a *j* or choosing the *-tA* partitive ending. The same applies to *järki*, with the *rk* combination adding to the complexity.

The fact that *nainen* is again fairly high on the list, in spite of the complexity of its inflection, is explained by its frequency, both as a type and as a lexeme. The other words which end in a consonant and consequently involve stem shanges are all towards the bottom of the list.

The correlation between the real and the nonce words is less evident with the partitive plural than it was with the genitive singular. The main reason is

the fairly low overall percentage of correct forms for the real words (43.1%). If there is uncertainty concerning the inflection of the model word, the inflection of a nonce word cannot be anything but random. Some of the principles suggested above seem to apply, but there are also other tendencies. In particular, the words ending in *i* seem to behave in a very random way, but this may be explained by the composition of the list: because the number of the rhyming forms is the basis of the list, *limi* and *muoli* are placed towards the end of the list, since only *limiä* and *muoleja* have been counted here, while *limejä* and *muolia* are equally acceptable in reality, as has been explained above. *härki* and *hesi*, for which the analogical forms are *härkiä* and *hesiä*, are fairly high on the list. This seems to indicate that for unknown words the partitive plural with *-iA* is the default form, while for the real words the singular forms with an *-e-* complicate the processing.

The order of difficulty presented above was based on the number of "correct" responses. It can also be examined through the variety of responses. However, when this was done, the results showed that with few exceptions the same words were located at the top, in the middle and at the bottom of the lists. For this reason the lists are not included here. The two ways of ordering the words also overlap: a large number of correct answers precludes variation among the rest of the answers. The differences found were caused by orthographic factors (for instance, words like *käivä* and *härki* produced a large number of different answers, as a result of the missing dots in some responses). With some words a resemblance with another word had added to the variation (e.g. *raiva*, which produced forms of *raivo* 'rage' or *raivata* 'to clear'). Overall, it can be concluded that the same factors which influence the success rate also influence the number of variants.

A hypothetical order for difficulty of the real words was established on the basis of morphophonological complexity (p. 89). An assumption underlying the test design was that the nonce words would be inflected more or less like the real words. Thus no separate hypothesis was established for them. It is for this reason that only the real words are considered in testing the hypothesis. Also, the hypothetical order of difficulty is based on the changes in both the genitive singular and partitive plural, i.e. overall paradigmatic changes, not only on changes between the nominative and one other form. Thus only the combination of the results for the two forms is examined in the light of the hypothesis.

The hypothetical ranking and the test results are shown in Table 14 below. In the first column the words are listed in order of difficulty, with the percentage of the correct answers. When the percentages are the same, the words are listed in alphabetical order. On the right the words are listed in the order suggested by the hypothesis. Again, the words within each group are alphabetized. For visual ease of comparison, the test results are grouped at 10% intervals, while the column on the right is arranged according to the hypothesis.

TABLE 14 Ranking of real words by percentage of "correct" genitive singular and partitive plural responses of the test group (N=35), compared with ranking suggested by Hypothesis 5.

Test result		Hypothesis	
1. koulu	79.0	koulu	1.
2. päivä	74.0	laiva	2.
3. laiva	72.9	päivä	3.
4. poika	71.4	tuoli	4.
5. kukka	67.2	katu	5.
6. nainen	67.2	keitto	6.
7. katu	62.9	perhe	7.
8. kauppa	62.9	tauko	8.
9. leipä	62.9		
		jalka	9.
10. keitto	58.6	kampa	10.
11. jalka	55.8	kauppa	11.
12. kenkä	55.7	kenkä	12.
13. perhe	55.7	kukka	13.
14. vesi	55.7	leipä	14.
15. nimi	52.9	lyhyt	15.
16. tuoli	50.0	nimi	16.
		silta	17.
		vieras	18.
		avain	19.
17.vieras	5.8	isompi	20.
18.silta	45.7	järki	21.
19.kampa	44.3	kauneus	22.
20.avain	42.3	kerros	23.
21.kerros	41.4	osoite	24.
22.tauko	41.4	poika	25.
23.isompi	40.0	puhelin	26.
24.puhelin	40.0	vesi	27.
25.lyhyt	31.4		
26.järki	28.6	nainen	28.
27.opas	20.0	onneton	29.
28.kauneus	17.2	opas	30.
29.osoite	15.7		
30.onneton	15.7		

The correlation between the two lists is quite high (r = 0.944).[52] The first three words on both lists are the same. The word *poika*, together with *nainen*, proved to be much better-known than was assumed, and *kukka*, *kauppa* and *leipä*,

[52]As no differences between the words within each group of the hypothetical list were postulated, they were assigned the same value. This was the average of the percentages of the correct answers given to the words in the corresponding position in the list on the left. Thus, for instance, the words in the third group were all given the value 53.9, which is the average of the correct answers which placed between 9 and 18.

together with *vesi, avain* and *puhelin* were slightly easier than expected. *keitto, perhe, silta,* and *kampa* were placed somewhat lower than was expected, as were *lyhyt, järki, kauneus* and *osoite* at the lower end of the list. With *tuoli* and *tauko* the difference was more dramatic.

The differences can mostly be explained by factors that override morphophonological complexity. Some potential reasons for these results have already been mentioned earlier in this chapter and in previous chapters. Some will also be discussed in 5.5. The relationship between the explanations will be discussed in 5.6 and in 8.1.

5.4 Missing and inappropriate responses

If a test is much too difficult for the subjects, they commonly either do not answer the questions or give random or nonsense responses, while a very easy test will not provide enough information about the limits of the subjects' abilities.

Since the only advance information about the students' knowledge of Finnish was their placement in an intermediate group, the test as a whole could have proved either very easy or impossibly difficult for them. For this reason I will review the missing and inappropriate answers, together with the acceptable (correct or otherwise) answers, given by the subjects.

TABLE 15 Missing answers of the test group (N = 35, total number of potential answers: 2 x 60 x 35 = 4,200).

	Real words		Nonce words		Total	
	n	%	n	%	n	%
sg.g.	41	3.9	102	9.7	143	6.8
pl.p.	111	10.6	175	16.7	286	13.6
Total	152	7.2	277	13.2	429	10.2

Responses for nonce words were missing more often than those for real words. Only 41 (of 1050) genitive singulars of real words were not given, mainly by two informants. According to the interview after the test, they were unwilling to write an answer unless they were sure that it was right. The partitive plurals of real words were missing more often than genitive singulars, but still given in nearly 90% of the cases. The differences between real words and nonce words and between genitive singulars and partitive plurals are statistically significant ($p < 0.05$).

Since the subjects did not know that there were nonce words in the test — for them they could have been real words which they had not encountered yet

— the difference between real words and nonce words can also be interpreted as a difference between known and unknown words. Although there are somewhat fewer answers for the nonce words than the real words, most subjects were willing to take a chance and inflect words they did not recognize. This is, after all, what they have to do when they look up a word in a dictionary or use a word that they have only heard in one form before, even if the test situation was obviously quite artificial. Nevertheless, several students inflected all given words in both forms.

In reading the answer sheets it seemed that more slots were left empty as the task wore on, which is natural, since the students grew tired. For this reason I calculated the number of missing answers for each half of the test separately. In the first half (the first 30 words) the percentage of missing answers for the genitive singular was 6.2% and for the second half (the remaining 30 words) 7.4%, and for the partitive plural 12.2% and 15.0% respectively. The proportion of real to nonce words in the first half was 16:14, in the second half 14:16, thus potentially contributing to the difference between the parts. The differences in the number of missing answers between the two halves of the test, however, are not statistically significant.

The assumption was that the control group of native speakers would be able to produce the required forms of all real words. This proved to be true, since there were no missing answers for real words. Almost all nonce words were also inflected by the control group: only 0.4% of the answers for the nonce words were missing (0.3% for genitive singulars and 0.5% for partitive plurals). It is obvious, then, that the Finnish group did not find the task very difficult, particularly since the majority of the missing answers were due to a subject having skipped lines, leaving out both forms of one and the same word.

Nonsense responses are another indicator of an overly difficult (or easy) test. Neither the test group nor the control group gave any answers which were totally nonsensical, but there were some responses which could be titled "inappropriate". These were answers which could not possibly be examples of the required form, i.e. they were forms which did not contain any essential features of the inflection in question (or, in another morphological framework, fit the schema in question). The numbers of such responses are given in Table 16.

An essential part of the genitive schema in Finnish is that the form ends in *-n*. Those forms which do not are "inappropriate" answers. All other answers given in the test can be considered appropriate, as the genitive singular of any new word (like a foreign name) can be formed by adding an *-n* if the word ends in a vowel, or by adding *-in* if the word ends in a consonant. The resulting sequence may not resemble normal Finnish word structure patterns, but since the test subjects had no way of knowing whether the words they had to inflect where of Finnish origin or not, unless they happened to know the word, one must consider all answers possible if an *-n* has been added. There were no cases in which an *-n* would have been attached to a final consonant without a mediating vowel. If the nominative ended in an *-n*, and the same form was given as a genitive, this was not counted as inappropriate, since there are

certain words in Finnish whose nominative and genitive coincide, e.g. *kymmenen* : *kymmenen* 'ten'.

In the partitive plural an inappropriate answer does not include a partitive plural formative, i.e. a sequence of letters which includes a variant of the plural marker (*i* or *j*) and a variant of the partitive ending (*-(t)A*). These include partitive singular forms and some forms with (at least seemingly) random letters added to the stem. Reduced forms that actually occur in speech have been accepted as possible, even when the above criteria are not fulfilled (e.g. *katui* pro *katuja*). In other words, the schema for the partitive plural consists of a combination of some plural-looking affix and some partitive-looking affix (minus possible reduction).

For both forms, attention has only been paid to the end of the word. An orthographic error early in the word (*pikia* pro *poikia*, *pampaja* pro *kampoja*) has not rendered the answer inappropriate.

TABLE 16 Inappropriate answers by the test group (N = 35, total number of potential answers: 2 x 60 x 35 = 4,200).

	Real words		Nonce words		Total	
	n	%	n	%	n	%
sg.g.	29	2.8	26	2.5	55	2.6
pl.p.	185	17.6	152	14.5	337	16.0
Total	214	10.2	178	8.5	392	9.3

The differences between real words and nonce words and between genitive singulars and partitive plurals are statistically significant ($p < 0.05$). The total figures show that slightly fewer than one tenth of the answers evidence no approximation to the schema in question. The difference between the genitive singular and the partitive plural, however, is quite big. This was to be expected, since the above criteria are more rigorous for the partitives: the inclusion of two items is required.

The inappropriate genitive answers consist of partitive singular forms — a natural mistake given the lay-out of the task — and of non-inflections, i.e. copies of the nominative or a part of it. It can be concluded that the subjects uniformly know that, to qualify as a genitive a form must end in *-n*. This, of course, was expected and pointing it out may seem superfluous. It is, however, a necessary prerequisite for evaluating the subjects' products: it indicates that the ending itself was not the cause of the problems.

The great majority of the partitive plural forms also showed that all learners had some idea of what Finnish partitive plurals generally look like. The inappropriate forms consist mainly of partitive singular and genitive plural forms. The occurrence of the former has semantic reasons: non-countables are used in the plural less frequently than in the singular. This has been generalized

even to nonce words: the analogy of *hesi* with *vesi* has given rise to singular forms instead of plural forms for this word as well. The latter were apparently caused by the lay-out of the task: after producing a genitive singular, a genitive plural was accidentally produced instead of the partitive.

The Finnish control group gave no inappropriate genitive singular answers for the real words and only one for a nonce word. For the partitive plural there were ten inappropriate answers for real words (partitive singulars like *kauneutta, keittoa, leipää, vettä,* and one nominative plural *vieraat*), but only four for the nonce words (*veden* pro *hesiä, härjen, härkit, tauneutta*). It seems that many errors are related to the meaning of the word: nonce words caused fewer errors since they have no meaning, while the partitive singular tended to replace the partitive plural for uncountable real words.

The missing and inappropriate responses reduce the number of analyzable results and reflect the difficulty of the test. Table 17 contains the combined figures from Tables 15 and 16 above.

TABLE 17 Totals of missing and inappropriate responses of the test group (N =35, total number of potential answers: 2 x 60 x 35 = 4,200).

	Real words		Nonce words		Total	
	n	%	n	%	n	%
sg.g.	70	6.7	128	12.2	198	9.4
pl.p.	296	28.2	327	31.1	623	29.7
Total	366	17.4	455	21.7	821	19.5

The differences between real words and nonce words and between genitive singulars and partitive plurals are statistically significant ($p < 0.01$). Only 6.7% of the genitive singulars of the real words were either missing or totally inappropriate, while only slightly over two-thirds of the partitive plurals of the nonce words were more or less possible partitive plural forms. Even in this group, however, there remain 723 answers which can be used in this study. Altogether, fewer than 20% of the answers are either missing or inappropriate.

The totals of the missing and inappropriate answers of the Finnish control group for the real words are 0% for the genitive singular, 1.3% for the partitive plural, and for the nonce words 0.4% and 1.0% respectively. The overwhelming majority of the answers given by the Finnish subjects can, therefore, be considered to be appropriate responses to the given task.

Judging by the overall number and quality of the missing and inappropriate answers, the test proved to be neither extremely difficult nor overly easy for the test group. In spite of the artificial nature of the task, both groups also seem to have performed the task seriously and with a willingness to show their knowledge of the Finnish nominal inflection. The distribution of

missing answers between the real words and the nonce words on the one hand, and between the genitive singular and partitive plural forms on the other, also supports Hypotheses 1 and 2 respectively.

5.5 Responses to individual test words

One way to determine which of the answers given by the learners to the nonce word tasks can be considered acceptable is to compare them with the answers given by native speakers. This can, of course, be seen as a stand for the nativist view of language: the intuition — or competence — of the native speaker is the measure of correctness, i.e. native speakers have complete control of their language. The errors they produce, for instance in this test, would then be due to performance limitations. There is, however, a more practical reason for the use of native speakers to determine the limits of expectations, regardless of the research paradigm: the Finnish of native speakers, of the same age and with a similar educational background to the learners, represents the learning goal. It is the performance that the learners strive to achieve, be their competence complete or not. (For further discussion of this issue, see Martin 1995b and 1995c.)

Each word-type of Finnish has its peculiarities as to stem changes in inflection — this after all is the basis of the division into types. Membership of a given type can often be determined by the sound/letter sequence of the word alone, but there are also types whose membership is lexical. In addition, consonant gradation adds to the complexity. Established words and new words are also often treated differently as to type allocation and consonant gradation (see 3.2.3). Given a nonce word to inflect, the native speaker and learner alike will have to resolve the competition between the various possibilities in one way or another.

The test answers which represent different outcomes of the competition of morphological factors are discussed below for each word. The extent of presentation may seem excessive, considering that one half of the words do not even exist and that this test is only one part of the whole study, but the discussion of these words is also used as an opportunity to illuminate many problematic details of Finnish nominal inflection, and to help understand the data presented in Chapters 6 and 7.

The test words are grouped along the lines presented in 3.2.3. This is not to be taken as a theoretical stance for this division at this point; as a matter of fact, the attempts to organize the contents of this chapter have proven a good argument for non-traditional classification principles (see Section 2.1). This classification simply proved the least repetitious. Within each group words are ordered by rough similarity. The more theoretical ramifications of the potential organizing principles will be discussed in Chapter 8.

Each entry contains a real word, with its standard Finnish genitive singular and partitive plural forms, a gloss, and the corresponding nonce word. In the

discussion a characterization of the nominal type is presented first, for the benefit of readers not thoroughly familiar with Finnish nominal inflection. Then follow the comments on the genitive singular answers of the control group (N = 25) and the test group (N = 35), followed by the partitive plural answers. The answers of the control group to the real words are not always mentioned if they are totally unanimous and agree with standard Finnish. Some misreadings and clearly orthographic errors have been ignored. The complete listing of the answers can be found in Appendix 1. The genitive singular answers are often discussed in greater detail, since it was at this stage of the test that the word had to be assigned to an inflectional category (if this was the procedure of the subject). The plural answers are likely to be influenced by the first decision.

5.5.1 Words ending in a vowel other than *i* or *e*

koulu : *koulun* : *kouluja* 'school'; *poulu*

The only cause for variation in the control group was misreading the nonce cue by 1 informant[53] (*polun* : *polkuja*). Both *koulu* and *poulu* were also very easy words for the learners. The plurals, too, were mainly correct, with a few wrong formatives: *kouluita, kouluia, pouluita, pouluneja.*

keitto : *keiton* : *keittoja* 'soup'; *leitto*

The quantitative consonant gradation in the genitive singular was produced by 24 Finns while 1 overweakened the nonce nominative by writing *leidon* (< **leito*). Most learners also produced the consonant gradation in both words, while about 20% applied it in neither *keitto* nor *leitto.*

All but 2 Finns and most learners produced the correct plurals for both words. The most common error was the partitive singular instead of the plural.

katu : *kadun* : *katuja* 'street'; *patu*

Qualitative consonant gradation in *katu* was produced by all Finnish informants, in *patu* only by 8 of them. The remaining 17 wrote *patun.* Although the *t:d* gradation is quite productive in Finnish, examples of non-gradation exist: *Tatu* : *Tatun* (first name), *toti* : *totin* 'toddy', etc. Some informants may have known *patu* as a nickname or as a slang word, with the meaning 'older man', which, like many slang words, is not subject to consonant gradation.

Compared with the Finns, the learners overdid the consonant gradation in the nonce word: less than half produced forms with no

[53]For ease of reading and comparison, all figures in these sections have been written as numerals, except when starting a sentence.

gradation. This is quite natural, since they could not know whether such a word was novel or not; there is hardly a more prototypical shape for a Finnish noun.

For the plural all the Finns were in agreement, and most learners also produced *katuja/patuja*. The other answers included singular forms and *katoja* (< *kato* 'disappearance') and *patoja* (< *pato* 'dam', *pata* 'pot').

tauko : *tauon* : *taukoja* 'pause'; *pauko*

The *k:Ø* gradation is generally more vulnerable to elimination than the *t:d* gradation, since the former changes the shape and syllable structure of the word more radically (see Yli-Vakkuri 1976, Martin 1989, 173–176). While all Finnish students produced it in *tauko*, 5 answered *pauon*, and 20 *paukon*. Of the learners 13 gave *tauon*, 13 *taukon*, 7 answered *pauon*, and 20 *paukon*. Some were aware of gradation but gave forms like *tauvon* (as *tauon* is often pronounced), *taulon* or *taugon*.

The plural *paukoja* was given by 20 Finns, but interestingly 5 suggested *paukkoja*, as if the nominative had been **paukko*. This is probably caused by the genitive *paukon* (cf. *joukko* : *joukon* : *joukkoja*) or the influence of *paukku* 'blow'. No such forms were given for *tauko*.

Some learners also suggested *paukkoja* but no one doubled the *-k* in *tauko*, thus strengthening the above hypothesis of extra-paradigmatic influence in *paukkoja*. The other answers in addition to the expected *taukoja/paukoja* included *taukoita/paukoita* and singular forms.

päivä : *päivän* : *päiviä* 'day'; *käivä*

The answers by the Finns were correct apart from one (*käiviän* : *käipiä*). Some learners had also assumed a reverse consonant gradation, producing *käipän*. As with *koulu*, the plurals by the learners (*päivätä, päivoja, käivejä, käiväjä*, etc.) again display their insecurity about the choice of the partitive plural formative.

kukka : *kukan* : *kukkia* 'flower'; *pukka*

All Finnish informants agreed on consonant gradation in this case. The learners did so in over 70% of the cases with both words.

The plurals were more varied. While most Finns voted for *pukkia, pukkaita* and *pukkoja* were also suggested. The same forms occur in the lists of the learners, together with other guesses.

kenkä : *kengän* : *kenkiä* 'shoe'; *tenkä*

The qualitative consonant gradation was applied by all Finns in the real word, and by 20 in the nonce word. The majority of the learners did so too. In addition to the majority who provided the correct form *kengän*, a few others also gave some other weak grade forms (*kengen, kengan*). The

same is true of *tenkä*, but the variety of the weak grade forms was wider: *tengän, tengan, tengen, tenän, tennän, tenjän.*

The nonce plural given by the Finns was usually *tenkiä*, but *tenköjä, tengiä* and *tenkkoja* were also suggested. The first is modelled after the two-syllable *a*-words (see e.g. *laiva* below). With the *-ä*-words the plural partitive ending in *-öjä* is only found in longer words (e.g. *myräkköjä* 'snow storms'). *tengiä* untypically has the weak grade, and models for this are hard to find. *tenkkoja* is the plural of **tenkka*, which as such does not occur, but is the first part of the colloquial *tenkkapoo* ('problem' < Swedish *tänka på* 'to think over'). If vowel harmony is ignored, the influence of the genitive *tenkan* could also be postulated as with *paukkoja* above (cf. *penkka* : *penkan* : *penkkoja*).

About 60% of the learners gave the acceptable plural *kenkiä*, together with somewhat fewer *tenkiä*-answers. The variety of the other responses is mainly accounted for by attempts to apply consonant gradation and by stem vowel variants.

leipä : *leivän* : *leipiä* 'bread'; *reipä*

All the Finns produced *leivän*, 15 *reivän*, 9 *reipän*, and 1 had no response. The learners produced *leivän* 27 times, *leipän* 8, *reivän* 14, and *reipän* 13 times. The other suggestions are associations with other words (*revin* 'I tear', *reikän* (from *reikä* 'hole').

The plurals of the Finns consist of *leipiä* and (mostly) *reipiä*. Of the learners 17 produced *leipiä*, 13 *reipiä*, with a great variety of other forms combining the results of different applications of vowel harmony and consonant gradation. With *leipä* there are also forms of the *leipo*-paradigm ('to bake'), with *reipä* of the *repi*-paradigm ('to tear').

poika : *pojan* : *poikia* 'boy'; *toika*

All the Finns applied consonant gradation in *poika*, but only 6 in *toika* — 5 used the model of *poika* (*tojan*), and 1 answered *toian*. The learners also knew *poika* fairly well: 30 answered *pojan*, 4 *poikan*, 1 *poikani*. The model of *poika* was stronger for the learners than for the Finns, since 11 answered *tojan*, 5 *toian* and 13 *toikan*. The other suggestions include *toisen* (< *toinen* 'other').

The nonce plurals produced by Finns show similarity with *tauko/pauko*: *toikia* 13, *toikkia* 9, *toikkoja* 2, and *toikkaja* 1. The model for the strong grade in the plural could be *loikkia* 'leaps' (cf. *loikka* : *loikan* : *loikkia*). The latter two can have no models since no such plurals are normally found for two-syllable *-a*-nouns with an *o* as the first vowel.

The form *poikia* was known by 20 learners, while 2 gave *poikkia* or *pojat*. *toikia* was given by 18, with many variations making up the remainder.

laiva : *laivan* : *laivoja* 'boat'; *raiva*

All the Finns produced *laivan/raivan*, as did most learners, except for 3 of them, who saw a chance for reverse consonant gradation (cf. *päivä* above) for the unfamiliar *raiva* and wrote *raipan*.

In the plural the Finns unanimously responded with *laivoja* for *laiva*, but interestingly, only 12 wrote *raivoja*, while 10 suggested *raivia*, 2 *raivaita*, and 1 *raiveja*. *raivoja* and *raivia* are both possible plurals for two-syllable nominals ending in an *-a*, but the distribution of *-oja* and *-ia* is supposed to be dependent on the first vowel of the word (see 3.2.3). Nevertheless, the informants here act as if they were in free variation. A weaker trend in the same direction was seen with *pukka*.

The form *raivoja* also happens to be the partitive plural of *raivo* 'rage' and in the test situation the informants may have wanted to avoid homonymy. Furthermore, the plural above this word was *päiviä*, perhaps leading towards *raivia*. *raivaita* could have the model *taivaita* (< *taivas* 'heaven'),and *raiveja* might be modelled after *draiveja* (< *draivi* 'drive').

Without the evidence from the control group the 9 incidences of *raivoja* vs. 12 of *raivia* produced by the learners could be totally dismissed as a result of incomplete learning. The system of the native speakers, however, is perhaps not quite as regular and stable as grammar books would suggest.

kauppa : *kaupan* : *kauppoja* 'store'; *tauppa*

All the Finns and 27 learners applied consonant gradation to *kauppa*, 23 Finns and 27 learners to *tauppa*. In other words, the learners behaved in the same manner, regardless of the familiarity or unfamiliarity of the word.

All the Finns gave *kauppoja* and all but one *tauppoja* for the partitive plural, while one suggested *tauppia*. *kauppoja/tauppoja* was also the most common response by the learners, but *kauppia*, *tauppia*, *kaupoja* and *taupoja* occurred too, as well as some singular forms.

silta : *sillan* : *siltoja* 'bridge'; *rilta*

This was the only word in the test which the alphabetic order put next to its model. There is also another model easily available: *ilta* : *illan* 'evening'. Nevertheless, 9 Finnish informants suggested *riltan*, while others applied consonant gradation, as all did in *sillan*. Learners produced *sillan* 18 times, and *rillan* 17. Most other forms have kept the *-lt-* intact, but weak grade forms like *sildan*, *rildan*, *rilsen*, *rillin* also occur.

For the Finns there is no variation in the plural, while the learners have produced many combinations of the stem and plural elements, structurally similar to those of many words above.

kampa : *kamman* : *kampoja* 'comb'; *jampa*

While all the Finns wrote *kamman*, only 5 produced the expected *jamman* and 18 preserved the strong grade, which gives further support to the assumption that qualitative consonant gradation is weakening in Finnish. The learners were fairly evenly divided between the alternatives. The fact that more learners applied consonant gradation to *kampa* than to *jampa* can be interpreted either as knowledge of the non-application of consonant gradation in novel words, or as evidence for the lexicalization of inflection: the familiar *kampa* underwent gradation, but not the unknown *jampa*.

As can be expected, the Finns were fairly unanimous on the partitive plural, since the gradation question does not come up. The two other forms suggested were *jampaita* (cf. *hampaita* 'teeth') and *jampaimia* (cf. *vempaimia* 'gadgets'), i.e. there was some influence of other paradigms.

About one third of the learners produced *kampoja* and *jampoja*. The other forms display problems with both gradation and the choice of the partitive plural formative.

jalka : *jalan* : *jalkoja* 'foot'; *halka*

All the Finns produced *jalan*. Although inflectional models for *halka* are very close (either *jalka*, which was in the test or *halko* : *halon* 'a split log'), only 9 Finns chose the form *halan*, although all wrote *jalan*. One produced *halgan* (not possible in standard Finnish) and the remaining 15 *halkan*. Learners made basically the same choices (*jalan* 22, *jalkan* 6; *halan* 12, *halkan* 17). In addition there were forms like *jallan*, *jaljen*, *haljan* and *halven*, all evidencing confusion within the consonant gradation system (see Table 1).

A word perceived definitely as a new loan would very likely remain outside the gradation system, but the prototypically Finnish-looking shape of *halka* and some close analogical models seem to influence the decision in the other direction.

Again, the variety of partitive plurals produced by learners is amazing. Not only are different partitive
plural formatives employed (*jalkia*, *jaloita*, *jaljeita*, *halkaita*, *halkija*, etc.), but it seems as if any word beginning with *hal-* has been offered (*halkea*, *hallia*, *halaa*, *haloja*, etc.).

Interestingly, the Finns also produced forms of *halka* which do not follow the usual rules of Finnish. As many as 7 suggested *halkia*. The word shape itself is entirely possible for other nominative types (cf. *olki* : *olkia* 'straw'). *halkaja* was proposed by 5 Finns, *halkaita* by 2 and *halkaimia* by 3. The reason may again be homonymy avoidance (*halka* : *halkoja* cf. *halko* : *halkoja*).

5.5.2 Words ending in an *i* or *e*

tuoli : *tuolin* : *tuoleja* 'chair'; *muoli*

All the Finns produced *tuolin*, 14 *muolin*, 11 *muolen*. *muolin* is the default form, but the model of *nuoli* : *nuolen* 'arrow' is likely to be influential, particularly since reading errors (*n* pro *m*) towards the familiar word could occur. Also, the given model *tuoli* only came later in the list. Of the learners 23 wrote *tuolin*, 9 *tuolen*, 15 *muolin*, 13 *muolen*. Only the *tuolen* forms are unexpected, as this is a very common word, but the emphasis generally placed on sound changes in beginners' courses of Finnish may have caused over-generalization, together with the model of *kieli* : *kielen* 'language'.

The Finns produced the plural *tuoleja* 16 times, *tuolia* 8 times, *muoleja* 8 times, and *muolia* 16 times. If the informants had been consistent in their choices, those who wrote *muolin* should have chosen *muoleja*, and, conversely, *muolen* should have been followed by *muolia*. This was not the case, however; in other words, paradigmatic cohesion did not hold. Part of the problem may have been that *tuolia* is used for the partitive plural in many dialects.

The learners chose equally often *tuolia* and *tuoleja*. Although the *-ia-* plural was generally prevalent over others in *-i*-words, with this word their behaviour mirrored the ambivalence of the Finns. The *tuoleja* plural seems to have been lexicalized to some extent, since with *muoli* the majority suggested *muolia*.

nimi : *nimen* : *nimiä* 'name'; *limi*[54]

All the Finns wrote *nimen*, 15 chose *limin*, and 10 *limen*. Keeping the *i* intact is the default procedure for new nouns, but *limi* has a strong pull-factor towards the *i:e* type from the very frequent *nimi* and *lumi* 'snow'.

The model *nimi* was correctly inflected by 23 learners, while 7 suggested *nimin*; 15 learners chose *limen*, 14 *limin*. The fact that more learners changed the vowel with *nimi* than with *limi* can again be interpreted either as knowledge of the treatment of novel words or as evidence for the lexicalization of inflection of *nimi*.

If paradigmatic cohesion were the determining factor, those who chose *limin* should also have chosen *limejä*, and *limen* should have been followed by *limiä*. This, however, was not consistently the case with either the Finns or learners. Both plurals are suggested, with the Finns dividing

[54]The word *limi* (*limin* : *limejä*) is actually listed in NS as an existing word in the sense of 'crack', but it is very unlikely that any of the informants, Finnish or other, knew this, since the word is not used in modern Finnish. The derived adverb *limittäin* 'overlapping' is used and may have influenced the responses. However, the probability is not very high, since none of the Finnish linguists I have asked to inflect *limi* knew the word nor saw the connection to *limittäin* unless the adverb was presented for comparison.

fairly equally between the two and the learners favouring *limiä*, regardless of their earlier choice. With the real word *nimi* Finns made no mistakes, and the learners again (correctly) favoured *nimiä*.

järki : *järjen* : *järkiä* 'reason'; *härki*

Although words of this shape are counted in the larger group of *i:e*-words, there are very few models, since there are only five two-syllable words which end in *-rki* and are known to most Finns. New loans like *muki* : *mukin* pull towards a more common and productive type. The familiar *järki* was correctly inflected, but for the nonce *härki* the opposite forces are even in strength: 9 Finns produced *härjen*, 9 *härkin* while 3 suggested *häre*n, and 2 *härin*, applying consonant gradation but differing with the choice of the vowel. Two other suggestions revealed associations with the word *härkä* 'bull'.

Of the learners 16 produced *härkin* or *härken*, 4 *härin* or *häre*n, and 8 *härän* or *härkän*. Thus, both the *i:e*-alternation and consonant gradation were considered by the learners as well as by the Finns, and the *härkä* paradigm was confusing for both. No learner produced any *härjen*-forms; apparently this fairly rare consonant gradation pattern was not remembered here, although 9 learners knew the form *järjen*. Otherwise, the real word *järki* was treated in a very similar manner to *härki*. Some other weak grades were offered: *härven*, *härgin*, *järien*, and *järvenen*.

The partitive plural *järkiä* was produced by 19 Finns; the other suggested forms were *järkeä*, *järkejä*, and *järkijä*. The fact that 6 native speakers failed to produce the correct plural for a common word is probably due to the fact that the word in question is rarely used in the plural, although *kärkiä* 'point' is likely to be known by all. *järkiä* was also produced as a plural by 11 learners, and all other forms produced by the Finns occurred as well, with a few fairly random guesses like *järietä*, *jarkinia*, *järinä*.

vesi : *veden* : *vesiä* 'water'; *hesi*

There are two inflectional patterns for two-syllable nouns ending in *-si*: the *vesi* : *vettä* : *veden* : *vesiä* -type and the *lasi* : *lasia* : *lasin* : *laseja* type. The former is a non-productive group with only 40 words, some of which are very frequent, while many are no longer even recognized by most speakers of Finnish. The latter type is productive. It was therefore to be expected that the majority of Finns (14) chose the form *hesin*. Unexpectedly, 9 people opted for *heden* (associations with the paradigm of *hede* : *heteen* 'stamen' are possibly an influence here), while 2 wrote *hesen* (cf. *kuusi* : *kuusen*).

The learners acted in the same way (*hesin* 11, *heden* 15, *hesen* 5). The fact that an analogical strategy prevailed is explained by the teaching that most informants had received: many actually referred to this word when

analogy was discussed in the interviews after the test (see 6.2). The *vesi* paradigm was familiar to most (*veden* 25, *vesin* 5, dialectal *veen* or *veten* 3).

The plural *vesiä* was given by only 21 Finns, again displaying the tendency to replace the plural by the partitive singular in uncountable words (cf. *keitto* above). The learners' plural forms for both words are also influenced by the meaning of *vesi*, since the frequency of *vettä* is much greater than that of *vesiä*. Other answers are rather random attempts to attach partitive plural materials to the *hes-*, *hed-* or *het*-stem. It is clear to nearly all learners, however, that *-si*-words are subject to stem changes, even when the nature of the changes is not clear. Some produce sequences of forms, such as *hesi* : *hesin* : *hesejä* or *hesi* : *heden* : *hedeitä*, which show that they are aware of the paradigmatic connections between the three forms.

isompi : *isomman* : *isompia* 'bigger'; *osompi*

All comparative forms are of the same type, and since none of the few other words in Finnish which end in *-mpi* have three syllables, the inflection could be expected to be unanimous. However, only 21 Finns wrote *isomman*, 17 *osomman*, 6 produced the adverb *isommin/osommin*, and 1 simply added an *-n*, the default stragegy to be expected.

The comparative pattern was fairly unfamiliar to the learners. Only about 20% produced the correct genitive, and several others showed some knowledge of it but made minor errors. The others tried various ways of adding the *-n* to the stem with various consonants (*m, mm, mp, n, mv, mpt*).

There was more agreement on the partitive plurals. The Finns were almost unanimous on *isompia* and almost so on *osompia* (one suggested *osompeja*). Almost two-thirds of the learners came to the same conclusion. Since the comparative paradigm was not well known in the singular, it is unlikely that it would be known in the plural either. The other suggested plural forms follow the lines presented above: miscellaneous stem consonants followed by miscellaneous partitive formatives.

perhe : *perheen* : *perheitä* 'family'; *terhe*

Both the *e:ee*-type and *e:e*-type (see 3.2.3) are productive, which was reflected in the answers of the Finns: 25 *perheen*, 20 *terheen*, 5 *terhen*.

The learners produced *perheen* 18 times and *perhen* 15. For *terhe* the figures were 13 and 16: in other words, the latter type won the competition for unfamiliar words.

The plural of *terhe* was *terheitä* for 18 Finns, *terhiä* for 5, and *terhejä* and *terhoja* each had one occurrence. *Terhi* is a girl's name, with the singular partitive *Terhiä*, plural *Terhejä*, while *Terho* : *Terhoja* is a boy's name, as well as a noun ('acorn'), although their model need not be the only reason behind these forms.

perheitä/perheita was the plural for 24 learners, and the equivalents for *terhe* for 13. Again the inflection of a familiar word was more uniform. The

other forms utilize other plural formatives, but *perhoja* 'butterflies' and *terhoja* also occur.

osoite : *osoitteen* : *osoitteita* 'address'; *asaite*

Two Finns read the nonce cue as *ansaite*, which does not really exist, but could be derived from the verb *ansaita* 'to earn' and might mean something like 'a unit of earning(s)'. This was the first word of the test, and the subjects, who were told only that some words were likely to be unfamiliar, but not that they are actually non-existent, may have been prone to believe that the words were at least potentially meaningful. This belief probably wore off towards the end of the test, when the subjects had met a long list of words to which they could attach no meaning.

While all Finns wrote *osoitteen*, only 6 learners did so, a good indication of the difficulty of this word-type for learners, as the word itself was certainly well-known. 14 suggested *osoiten*. If the 2 answers described above are included, 5 Finns and 3 learners altogether inflected *asaite* in the same way as *osoite*. 20 Finns and 24 learners simply added an *-n* (*asaiten*), which can be considered the general default strategy for unknown words ending in an *-e*.

The partitive plural forms for *asaite* display a considerable variation in both groups, as do the learners' answers for *osoite*. Only 3 people in each group had written *asaitteita*. Most of the other answers end in a combination of letters which is a possible partitive plural formative for some group of nominals (*-eita, -ita, -eja, -ija, -oja, -ia*), but even among the control group there were inappropriate forms, and there was no one form which was clearly more popular than the others. If the word is perceived as a novel loan, the partitive plural should be *asaiteja* (cf. *karaoke* : *karaokeja*). At least part of the variation may be attributed to the fact that the subjects were not yet familiar with the task.

5.5.3 Words ending in a consonant

kerros : *kerroksen* : *kerroksia* 'storey'; *lerros*

Practically all words ending in *-os* have the stem *-okse-*. This apparently was part of the native speakers' knowledge of Finnish, since 23 chose *lerroksen*, and 2 *lerron*, ignoring the final *-s*. The first alternative was also chosen by most learners, while the latter procedure was followed by about 20% of them, the others adding *-in* or *-en*.

The plurals reflect the choices made with the genitive. The ones with the *-okse-*stem produced *kerroksia, kerroksija* or *kerrokseita* (similarly with *lerros*). The others added plural formatives to the *s*-less stem, with a varying number of *r*'s.

kauneus : *kauneuden* : *kauneutta* 'beauty'; *tauneus*

Many names of characteristics or properties can be recognized by the ending *-UUs*, but those with two different vowels preceding the *-s* can belong to other types as well (e.g. *vastaus* : *vastauksen* 'answer'). However, even if there is no adjective from which *tauneus* could be derived, 22 Finns chose *tauneuden* and only 3 *tauneuksen*.

Since this is not one of the first word-types to be learned, most learners in the test clearly did not recognize the type. Only 4 wrote *kauneuden*, 8 *kauneuksen*, 5 *kauneun*, 3 *kauneusen*, and 2 *kauniin*. The results for the nonce word were similar: 2 wrote *tauneuden*, 11 *tauneuksen*, 5 *tauneun*, and 7 *tauneusen*. Thus the most productive *-s* : *-kse* type was the most common choice, while other more or less makeshift attempts were made to solve the problem.

Since the plural partitives of the *-s* : *-de-* and *-s* : *-kse* types are the same (see 3.2.3), the learners experienced fewer problems with them. Still only about one quarter of the plurals were correct, and there is a great deal of variation with many partitive plural formatives, stems of both *kauneus* and the adjective *kaunis* 'beautiful'. Moreover some Finns mixed the forms of the noun and the more frequent adjective *kaunis* 'beautiful'.

vieras : *vieraan* : *vieraita* 'guest'; *hieras*

The membership of this word-type is lexical, although certain vowels preceding the *-s* are more likely to produce this inflection. As a model for *hieras*, *vieras* is closer as a model than any member of the other potential and more productive type (*kerros* : *kerroksen*). Accordingly, 20 Finns produced *hieraan*, with 4 suggesting *hieraksen*, and 1 both.

Among the learners 25 had produced *vieraan* or *vieran*, 24 *hiera(a)n*. *vieraksen* was offered by 4, *hieraksen* by 2. The combination strategy normally used for foreign loans was displayed as *vierasen/hierasen* by 3 informants.

Although most Finns proceeded from *hieraan* to *hieraita*, 3 subjects gave the plural *hieroja*, as if the nominative were *hiera*, thus breaking the paradigmatic cohesion. *vieraita/hieraita* were also more common with the learners than other forms, but again many partitive plural formatives were utilized: *hiereitä*, *hieroja*, *hieraksia*, *hierasia*, *vieroita*, *vieraisija*, etc. As with other words ending in a consonant, the forms can also be distinguished according to whether they are based on the factual consonant-ending nominative or on a real or imagined vowel stem.

opas : *oppaan* : *oppaita* 'guide'; *ipas*

Opas differs from *vieras* by reverse consonant gradation. Two models immediately offer themselves for comparison for *ipas*: *opas* and *lipas* 'box, case', both of the same inflectional type. 11 Finns chose this route, 7 suggested *ipaan* (ignoring reverse consonant gradation), while only 4

selected *ipaksen*, which is generally the productive alternative for the new *-s*-words. *ipasen* and *ipan* were also offered. For the real word *opas*, 1 informant gave the forms *opaksen* : *opaksia*.

Op(p)(a)an or *ip(p)(a)an* was the most common alternative for the learners as well, while *ipaksen* was not given by anybody (one wrote *ipasksen*, possibly with this alternative in mind), and *opa(s)ksen* was offered by 3. The combination strategy, *opasen/opasin*, *ipasen/ipasin*, was used by 4/6 learners. Confusion with other noun types explain forms like *opaden* and *ivanen*.

The partitive plurals of the Finns include only 7 *ippaita* and 8 *ipaita* forms. Those who offered *ipaksen* also offer *ipaksia*. The other forms are not regular plurals of the *-s*-words — *ipasia*, *ippoja*, *ippaimia* — and can thus be considered evidence for a paradigmatic breakdown.

Although *op(p)aita/ip(p)aita* (14/9) were more commonly offered by the learners than any other forms, they do not form a clear majority. The other suggestions include some which seem products of associations with other words: *oppia*, *opasteja*. Some seem like experiments within the general partitive plural schema: *opaseja*, *ipeitä*, *ipastia*.

nainen : *naisen* : *naisia* 'woman'; *kainen*

The words ending in *-nen* are a frequent, productive and uniform type. Nevertheless, only 13 Finns produced *kaisen*, while 6 left the word uninflected and others gave suggestions borrowed from other types (*kaineksen* < **kaines*, *kaimenen* < **kaimen*, *kaineen* < **kaine*, *kaikaimen* < **kaikain*). The reason is likely to be found in the number of syllables, since most words ending in *-nen* are longer. However, many of the two-syllable ones are reasonably frequent (*nainen*, *toinen* 'second, other', *mainen* 'earthly', *puinen* 'wooden', *moinen* 'such', *loinen* 'parasite').

This was one of the few words for which the performance of the learners equalled that of the native speakers. The same percentage produced *kaisen*, and non-inflection was the second alternative. Both also suggested various other forms, such as *kaineen* (cf. *laine* : *laineen* 'wave').

The regular *-sia* plural for the *-nen*-words was suggested for *kainen* by less than half of the subjects in both groups. The suggested plurals show similar solutions in both groups: various combinations of stem changes and partitive plural formatives were tried. There is a difference between the groups, however. While the learners' products reflect manipulation of these variables without much regard to the shape of the result, the Finns have chosen to write forms which can be seen as possible parts of other paradigms: *kaineita*, *kaineja*, *kaisenia*, *kaineksia*, *kaikaimia* (cf. *laineita*, *kaneja* 'rabbits', *jäseniä* 'members', *aineksia* 'elements', *vatkaimia* 'mixers').

avain : *avaimen* : *avaimia* 'key'; *ivain*

Words which end in *-in* (and are not superlatives of adjectives) normally have the stem *-ime-*. Foreign loans, particularly names, are an exception

(*Selin* : *Selinin*). This alternative would seem attractive for new words in general, since it fits the general tendency of simplifying the inflection of new words, but the *-ime* stem seems to be fairly productive: 20 Finns chose it for *ivain*. Other choices were sporadic. Part of the productivity of this stem may be due to the fact that *-in* is a derivational suffix indicating an instrument, and new words with this ending are specifically suggested by the Language Board for new implements. There is also evidence of the productivity of this type in dialects (Itkonen 1976, 56) and American Finnish (Martin 1989a, 129).

Although over half of the learners wrote the correct form *avaimen*, only about 30% suggested the corresponding form for the nonce counterpart. The other solutions for both words included non-inflection and connecting the genitive *-n* with the stem by the vowel *-e-*. Some saw the word as a part of the *-nen* paradigm and produced *-sen* genitives.

Most Finns also stayed within the *-in* : *-ime* paradigm in the plural, though not all. There are a couple of answers which suggest the influence of the superlative paradigm: *ivampia*, *ivainpia*.

The learners produced more partitive plural forms for *avain* than for any other word (18). The correct form and the partitive singular together account for about 46% of the answers, and the remaining ones are nearly all different. Most include a partitive plural formative that is possible in some words, and the stem is handled in a way which again is possible in some words (dropping the final vowel, changing the *-n* to an *-s-*, changing the *-n* to an *-m-* or *-mm-* or leaving it intact). Thus the answers show that the learners had a notion of the kinds of processes which are possible but not of their constraints. The same insecurity is consequently seen in the forms of *ivain*.

puhelin : *puhelimen* : *puhelimia* 'telephone'; *tuhelin*

Apart from the number of syllables, this word is of the same type as *avain*. Again, all but one Finn produced the correct form for *puhelin*, while 21 also produced the *-ime*-stem in *tuhelin*, 2 left the word uninflected, and 2 connected the nominative and *-n* with an *e/i*.

17 learners knew *puhelimen*, while 13 analogically answered *tuhelimen*. The other responses include non-inflection and forms like *puhelimmen*, *puhelinen*, *puhelisen*, *puhelen* and similarly for *tuhelin*.

The Finns produced the plurals *tuhelimia* (23), *tuhelinia* and *tuhelia*. It could be assumed that the longer the word, the easier it is to associate it with a model word which is only different by the first letter. This, however, does not receive support from the results here. The length of the word allowed a large number of variants in the productions by the learners. *puhelimia* was given by 11, *tuhelimia* by 8. The remainder include forms with various plural partitive formatives and variants of the final *-n* (*-m-*, *-mm-*, *Ø*, *-s-*).

onneton : *onnettoman* : *onnettomia* 'unhappy'; *enneton*

This is a productive adjective type with a caritive meaning. The derivative suffix clearly indicates the inflectional type, and there is no other clearcut way to inflect a word ending in *-ton* in Finnish. This is evidenced by the variety and quality of the answers. 24 Finns gave the productive inflection for *onneton*, 16 for *enneton*, 2 did not answer for the latter (which was rare among the Finnish informants, see 5.1), and the remainder tried various combinations of consonant gradation and attaching an *-n* to the nominative, as if the word were a loan.

Only 4 learners had produced *ennettoman*, which is understandable, since only 5 had written *onnettoman* and 6 *onnettomia*, which all Finns had done. Although the type is productive and common, it is usually presented fairly late in L2 studies of Finnish and is often perceived as exceptionally difficult by learners. Most subjects thus simply did not know how to inflect a word of this type.

The nonce word in this case received fewer answers of a different kind from the learners (11, gen.sg. and part. pl. combined) than the real word (26). This may be explained by a vague familiarity with the meaning and the type, which is often expressed by an insecurity of inflection among learners. Most learners probably had some notion of the meaning of *onni* and of the meaning of the affix *-ton*, and even that the inflection of *-ton*-words is complicated in some way, while the nonce word aroused fewer semantic connections. The *-n* : *-m*-alteration (real: 21 times, nonce: 21) was better known than reverse consonant gradation (11, 10).

The variation is extensive again. The learners tried many combinations of both endings added to the nominative with or without stem changes: *ennetonen, onnetonnen, ennettoksen*, etc. Another strategy was to remove the final *-n*: *ennetoen, onnetoon, onnean*, etc. The last example shows how a familiar member (*onnea!* 'congratulations') of the same word family has influenced inflection. In general there was much confusion with other word-types (*onnetosen* cf. *valkoisen* < *valkoinen* 'white'; *onnetoksen* cf. *odotuksen* < *odotus* 'expectation').

lyhyt : *lyhyen* : *lyhyitä* 'short'; *pyhyt*

Apart from participle forms, the NS lists only 43 words which end in *-Ut*, and many of these are very rare. The existence of some frequent models (*lyhyt, olut* 'beer', *ohut* 'thin', *kevyt* 'light') was enough to guide 18 informants of the control group to *pyhyen*. An additional help may have been the fact that no easy choice is available; only names like *Marjut* : *Marjutin* offer themselves as models, since a participle form cannot end in *-hUt*. The other answers include *pyhyn, pyhtyn* and *pyhdy*, as if consonant gradation were involved.

16 learners gave *lyhyen*, 13 *pyhyen*, 12 *lyhy*, 10 *pyhyn*, and 2 produced *pyhyten*, treating the word like a loan. The influence of *pyhä* 'Sunday, holiday' could also be seen.

The suggestions by the Finns which included consonant gradation continued in the plural: in addition to 19 instances of *pyhyitä, pyhtyjä* and *pyhyjä* were also given, as well as *pyhiä*. The learners produced similar forms but with more variation; an additional confusion was caused by the *puhua*-paradigm.

5.6 Factors influencing the inflection of context-free words

A need to probe learners' skills in the production of individual word-forms in a test situation guided the design of the test, the results of which have been presented in the previous sections. In this concluding section, I will summarize these results to draw conclusions about the learners' success and strategies. These will be compared with the results from other types of data in Chapter 8.

In the previous sections many problems of the test itself, as well as the interpretation of the results, have been discussed. There seems to be no reason to doubt that the test answers of both the learners and the control group were given in good faith and show the ability to move about in the Finnish inflectional system. The test proved neither overly difficult nor overly easy for the learners, measured by the indicators presented in 5.1. and 5.4. The answers of the control group show that once minor slips and idiosyncracies are removed, agreement on the real words is practically complete, while nonce words produced more variable answers (5.2).

The results concerning Hypotheses 1–5, presented at the beginning of Chapter 5, will first be briefly summarized. After that, several issues brought up by the qualitative analysis of the results will be discussed.

The first hypothesis, **real words will produce more correct answers than nonce words**, claims, in effect, that known words are easier to inflect than unknown words belonging to the same inflectional category. This proved to be true taking a strict definition of correctness: both groups fared better with real, familiar words than with similar nonce words. If answers which employ inflectional models beyond the test are included in a limited sense (such as *limejä, hieraksen* pro *limiä, hieraan*, cf. *nimiä, vieraan*), the hypothesis still holds. If, on the other hand, any phonotactically possible string including a case (and plural) marker is accepted, no difference remains. The behaviour of the control group did not provide very dependable guidelines for decision-making, either.

Hypothesis two, **there will be more correct answers for the genitive singular than for the partitive plural**, is true for the test group but not for the control group. Apparently either the added cognitive load arising from the processing of an additional marker (case + number as opposed to only case) or the relative infrequency of the plural forms was significant for the learners but not for the native speakers, especially since all real words in the test were extremely common.

The information provided by the missing answers supports both hypotheses: fewer answer slots were left empty for real words and genitive singular forms than for nonce words and partitive plural forms.

Hypothesis three, **nonce words will produce a larger number of different answers than real words**, is not supported by the learners' figures which include the total variation. If the answers given by only one informant are removed, the difference between the real words and the nonce words becomes significant. This would seem to indicate that many non-correct answers for real words are individual errors.

Hypothesis four, **there will be a larger variety of answers for the partitive plural than for the genitive singular**, is, on the other hand, supported by the data which include the all answers, but not if answers given by only one testee are removed. In other words, some of the partitive plural answers were likely to be wild guesses. Nevertheless, many of the answers given by only one person have the general shape of the partitive plural, but the formative has been attached to the wrong kind of word. This would suggest that the partitive plural formative is seen as a whole, as one morpheme, and these answers are not totally random but represent an interlanguage stage at which the general schema for the partitive plural is familiar but the details have not yet been worked out. In this sense the systemic variation in the answers of the learners can actually be interpreted as a sign of many of them having reached a certain stage in the acquisition of Finnish morphology, not necessarily as a sign of total bewilderment.

Hypothesis five, **the morphophonological complexity of the word will determine the ranking of the words**, was confirmed, to a certain degree. To explain the exceptions, however, morphophonological complexity must be more carefully explored. It is also necessary to account for some other factors which influence inflectional production.

The complexity and **length** of a word seem to be related in the test: longer words seem to have generated fewer correct answers and more different answers than shorter words.[55] This is to be expected: a long word offers more opportunities for variation and misspellings. In the design of the test, however, word length was only considered when multisyllabic words ending in vowels were excluded; this was done in order to limit the number of test items.

It is possible, however, that the length-effect is more significant for the test words than for Finnish vocabulary generally. There are large classes of polysyllabic words which present few problems. For instance, all the derived words ending in *-minen* and *-lAinen* have a fairly complex but totally regular alternation pattern and are usually easily acquired, while many very short

[55]Statistical evidence in support of this statement is not presented here, as the test was not designed with this aspect in mind. In Finnish, length and complexity are interrelated in non-compounds: longer words are often derivations with suffixes subject to phonological alternations. Thus, a test to yield quantifiable results for studying the relationship of length and complexity, and to tease out the effect of each factor separately, would have to be constructed along very different lines from this one, where the criteria for selection of the items were membership in certain word-types and familiarity to the learners.

words, such as pronouns and numbers, have complex and unpredictable alternations.

When the test words were listed in a hypothetical order of difficulty (5.3), only the number of morphophonological changes was considered. To explain the results, however, the **quality of the changes** must also be considered. For example, the instances of consonant gradation do not seem to be of equal difficulty. The quantitative changes (*kk* : *k*; *pp* : *p*; *tt* : *t*), together with the qualitative changes *t:d* and *p:v*, turned out to be easier than the other ones. The combinations of two different consonants (*mp* : *mm*; *lt* : *ll*, etc.) were of medium difficulty, while most trouble was caused by the changes involving *k*. The direction of the alternation has an important effect: reverse gradation was undoubtedly more difficult than the regular gradation: *pp* : *p* and the reverse *p* : *pp* were at opposite ends of the difficulty scale.

Nor are all other changes equal: the changing of the final vowel before the plural marker may be a slightly more complex change than the dropping of the final vowel (*päiviä* precedes *laivoja*, *kukkia* precedes *kauppoja*). A look at the ranking list of difficulty also shows that there is a much bigger difference between *tuoli* and *tuoleja* than between *laiva* and *laivoja*. The basic question then is whether various kinds of phonological change are perceived to be equal: Removal of a unit versus addition of a unit versus replacement of a unit? Are all phonemes cognitively equal? Are certain pairs of vowels or consonants perceived to be closer to each other or more readily interchangable than others? I know of no experimental data on any of these questions. If some hierarchical tendencies could be established, they might explain some of the behaviour of the control group in this test. In the case of learners the influence of the phonemic structure of the mother tongue is likely to complicate the matter further, and so the data on Finnish alone would not be sufficient.

Other factors

The test was structured around the notion that the **familiarity** of a word (or word-type) is of significance in inflection: this is why nonce words were employed. In this test Hypotheses 1 and 3 were conditionally supported. There were also occasions of the very high familiarity of the word increasing the chances of consonant gradation and explaining some differences between the real words. For example, the difference between *poika* and *tauko* can only be explained by the greater familiarity of the former. In so far as familiarity is of importance, it points towards the position that morphological processing is to some extent lexically controlled.

In a context-free situation familiarity is closely related with knowing the **meaning** of the cue word, since the subjects can only trust their accurate recognition of the cue, with no help from the context. One feature of the performance of the Finnish subjects in particular was that, in problematic situations, semantic processing often took precedence, even when a structural model word was available nearby. It is possible that there are individual differences among both native speakers and learners in this respect: some are more form-oriented and are able to utilize rules and/or analogy while others

may be more meaning-oriented and associate words by recourse to their semantic properties.

One type of semantic influence is homonymy avoidance: forms were not produced purely on structural criteria. Forms such as *halkaja* or *raivaja* are examples of this: no such plural participle shape exists in Finnish, but some members of the control group chose to override this problem, perhaps in favour of avoiding homonymy.

Sometimes the meaning of the model word extended to the nonce pair as well. The large proportion of *tauneuden* genitives and some forms of *hesi* (*hettä*) are examples of this. The partitive singular, however, replaced the plural for uncountable real words more often than for nonce words, and beyond the examples above, it is impossible to detect whether any meanings were attached to nonce words.

Some word shapes seem to be more attractive than others. Test answers gravitate towards them, regardless of the word-type or other considerations. I have called these **default forms**. For instance, in search of partitive plural forms many learners seem to operate with the principle "when in doubt, make it end in *-iA*". This trend could be seen particularly in the word *isompi* and most nonce words ending in *A* or *i*, even if the great majority of Finnish words ending in *-i* in the nominative singular actually have an *-ejA*-partitive in the plural. The *iA*-partitive may also be the default form among the native speakers, as both the test results and many slips suggest. Further exploration of this hypothesis might also yield illuminating information for the diachronic study of Finnish.

The default for the genitive is the addition of *n*, without any stem changes (as *isompi* : *isompin*, which was even suggested by one of the Finns). If the cue ends in an *n*, no addition is needed (*puhelin* : *puhelin*). The combination of these strategies results in a default paradigm *-i* : *-in* : *-ia* for the *i*-words.

Another factor which seems to influence inflection, at least in a test situation, is what I call **paradigmatic problem potential**: if a word belongs, or is perceived to belong, to a category with morphophonological changes in one part of the paradigm, this may also affect forms with no changes. Learners, in other words, anticipated difficulties where none existed. A good example of this is the genitive singular of *tuoli*, which appeared relatively low in the ranking lists. A possible explanation is that it includes an element of uncertainty: an *i*- or *e*-stem? Also, the fact that the genitive singular contained changes (as in *tauko* : *tauon*, *vesi* : *veden*) prevented many subjects from seeing that the required plural was really quite simple (*taukoja*, *vesiä*). In the test the latter examples could have been caused by the lay-out, but more generally it is a problem that can only appear if word-forms are seen as linear paradigms where the members follow each other. If, for instance, paradigms were seen as chain categories (see 2.1), this particular problem would disappear.

Paradigmatic influence is evidenced also by partitive plurals such as *paukkoja* (< *pauko*) and *toikkia* (< *toika*). A self-produced, non-graded genitive form (*paukon*, *toikan*), instead of the nominative, became the basis for the partitive plural. As the genitive is normally in the weak grade and the partitive in the strong grade, the result could not be based on the given nominative, thus evidencing lack of intra-paradigmatic cohesion.

Paradigmatic breakdown can also be interpreted as inter-paradigmatic confusion. Forms such as *ipasia, ippoja, ippaimia* are not normal plural forms of any *-s*-word-type, but other types of nominatives could be postulated for them (**ipanen, *ippa, *ipain*). This was particularly common in the control group, who freely borrowed forms for nonce words from paradigms other than the one indicated by the shape of the cue word. In familiar real words only one Finnish subject showed inter-paradigmatic confusion (*opas* : *opaksen* : *opaksia*).

The fact that the test words were presented without a **context** obviously affected the results. At least some kinds of error are likely to occur less often in a context, e.g. a wrong case or an adverb instead of the genitive (*isommin* pro *isomman*). However, it may also be easier, at least for learners, if they have no need to read and understand a lengthy context. Presenting individual words allows one to concentrate solely on the task at hand.

When words to be inflected are listed one after another, as was done in this test, it is reasonable to suspect that they may not be perceived as individual words but rather as a mass. The results, however, do not support this suspicion. No influence from neighbouring words could be found, even when it would have been helpful, as in case of *rilta* and *silta*, where several subjects managed to produce the consonant gradation in one but not in the other. In this sense the test results confirm that whatever principles of inflection the subjects employed, it was the factors relating to the individual words that influenced the decisions, not the position of the word in the list.

Inflectional strategies

What are the choices one has when confronted with an unfamiliar word to inflect? One can either produce the form by rules, or by analogy, or make a wild guess. When the word to be inflected is familiar, the production of the form ready-made from memory is added to the choices. Production from memory was assumed to reduce the number of potential answers (Hypothesis 3), but this requires that the process is faultless. If the form is not completely learnt, production from memory can lead into additional wild guesses, since any part of the word may be subject to misremembering, while misapplication of analogy or rules usually leads to some kind of logical error. There is, however, no absolute method for distinguishing different types of error.

Most test words represent word-types for which correct forms can be produced by applying the most common type of consonant gradation and vowel change rules. Technically this can be done with equal ease with real and nonce words, and the process should result in rhyming forms. Even the most complex forms can be arrived at via rules, provided one is competent enough to apply several of them in a hierarchical order. Intuitively, however, it could be assumed that analogical processing is more likely to play a significant role for complex words, such as *enneton*, or for words for which there are two fairly equally available choices, as with *hieras* (*hieraan* vs. *hieraksen*).

The test results cannot be used to confirm which forms were produced by rules, and which by analogy. The process is simply not apparent in the product. It is obvious that all forms were not produced by analogy, since only about

two-thirds of the produced nonce forms are analogical (in the proportional sense). By the same token, they either were not produced by rules or else the rule application failed.

Some type of analogical processing seems to have been present in the production of the test words, however. An answer like *tojan* is likely to be a result of analogical processing, while *toikan* is produced by a default rule. For some nonce words (e.g. *kainen*) a wide variety of forms were produced, most of which cannot conceivably have been generated by rules, while analogical model words can be found. Misreading of nonce words can also be interpreted as a mental search for analogical models, as well as a search for meaning.

Learners can also be expected to employ analogical processing because they are often explicitly taught to look for model words. However, they have fewer model words available, while native speakers may be able to compare a word to many different potential models.

A major theoretical problem concerning analogy is to determine its limits: How similar must the model word be to function as a model? Are all differences between two words equally important? Are loan words allowed as models? For learners it must also be asked: Which words does s/he know? Do learners sometimes use words from other languages as models? These questions cannot be answered on the basis of the results of this test, but carry seeds for many future experiments.

The test group and the control group

The performance of the test group and the control group have been discussed along with various aspects of the results. In addition, some features of their behaviour will be summarized below.

As could be expected, the command of common familiar words among native speakers is nearly perfect, while the performance of learners is clearly related to the number and kind of phonemic changes between the given form and the required one. The few errors the Finns produced cannot be explained by morphophonological complexity. They occur in forms which are relatively infrequent for the lexeme in question (e.g. *vesiä, järkiä, kauneuksia*). It is neither possible nor necessary to determine whether the errors were caused by semantic factors or by infrequency, as it is the semantic reasons that make these forms less frequent than their singular counterparts. Some errors, like writing a partitive singular instead of a genitive, may also be due to contextual factors.

Although all nonce words were phonotactically possible Finnish words and represented common nominal types, the control group had many difficulties with them. This is clear evidence for the argument that inflection is at least partly lexically-governed. The variation is understandable in groups where there clearly are two choices, as with the *-i*-words and the *-s*-words. With competing models or with two possible rule systems to apply, it is natural that some opt for one, some for the other. The variance with the *-a*-words is more surprising: either Finns make mistakes just like the ones that learners make or then the traditional concept of what is acceptable in Finnish must be modified.

Some products of the Finns may be indicators of a current change in the system. For some nonce words qualitative consonant gradation was produced by less than half of the Finnish subjects. This may predict that as novel words enter the language, they increasingly often do not participate in gradation. From the viewpoint of the sheer number of morphophonemic changes this may be an improvement, but it also makes the system less predictable: more words will have to be lexically marked for consonant gradation, as the mere appearance of a certain consonant is no longer enough of a clue.

In some ways learners may even have an edge over the native speakers in a test of this type. One seldom needs to handle totally unfamiliar, context-free words in one's mother tongue, while learners constantly meet words that they do not recognize. Every time they look up a word in a dictionary and wish to use it in a sentence they are faced with an inflection task very similar to the ones in the test. Most of them also attend classes in which explicit rules are given and the application of analogies is practised. It may be for this reason that learners were less dependent on knowing the word: their results with the nonce words resembled those with the real words, while the difference between the two groups of words was much greater for the Finns.

The control group proved useful for a survey of the strategic possibilities used in inflectional production. The factors which affect production by native speakers also appear in the behaviour of learners: insecurity about consonant gradation for novel words, paradigmatic confusion, failure in the application of rules or analogical models, or semantic associations which override the structural ones. However, it did not turn out to be of much help in determining the range of acceptable answers for nonce words, as the products of the Finns varied almost as wildly as those of the learners.

Summary

Closer examination of the test results shows that information was obtained not only about the statistical issues presented as the hypotheses, but also on a number of other interesting points. In particular, the performance of the control group was sometimes rather unexpected. The validity of a native speaker control group when studying learner performance is discussed in Martin (1995b), and in Latomaa (1995). For the purposes of the current study, however, the answers of the control group provide a valuable backdrop.

6 THE LEARNERS' VIEW: INTROSPECTION RESULTS

One of the theoretical starting points of this study is that achieving control over a new language as an adult depends both on conscious and unconscious processes. The conscious part of language learning is declarative: it can be discussed. In this chapter I will present data from 18 learners who were interviewed about their inflectional strategies. The mode of data collection and the background and limitations of the method were presented in 4.3. As it is the content of the sequences that is discussed, the transcriptions and translations are only accurate enough to convey the voice of the speaker; phonetic precision has not been the aim. Additions necessary for understanding the sequence without the context are in rounded brackets ( ), while attempts to interpret deficient expressions are in square brackets [ ]. The words which were given to the interviewees to inflect, either in sentences or alone, are in italics.

The morphological forms produced by the interviewees are not analyzed here, although broad statements on language skills are made in relation to the content of the interviews. The discussion of the introspection data is divided into three parts. In 6.1 the focus is on the learners, their attitudes towards language acquisition, and their ways of approaching the issue. In 6.2 the inflectional strategies, as expressed by the learners, are classified and considered. In 6.3 some theoretical aspects of the results are discussed.

6.1 Learners as experts on language acquisition

The interviews immediately highlighted the fact that learners display great individual differences in their ability to describe their inflectional knowledge and strategies. It could be assumed that learners who had mainly learnt Finnish in a classroom context would be better able to describe what they do than those who had had almost no formal teaching. On the basis of these interviews it

seems, however, that personal factors are more important than the learning situation, although those with some formal instruction, particularly at university level, naturally have better grasp of grammatical terminology.

The individual differences can be illustrated by Examples 1 and 2. Both learners were quite willing to describe their strategies and were equally successful at it. The first speaker, VM, is a 20-year-old Hungarian university student who had studied Finnish for about a year. For her, Finnish is a mandatory subject, a part of her studies in Finno-Ugric Linguistics. She had arrived in Finland about one week before the interview to participate in a summer course.

(1) VM: (reads:) virtasen *perheessä* on neljä tyttöä. hmm, tässä on, (gesticulates) en tiedä mitä.
MM: suluissa. se on suluissa.
VM: ei. *perhe*. (draws the sign for initial consonant lengthening.)
MM: ahaa, joo joo, siitä, siinä on loppukahdennus
VM: (reads:) kaikilla *tytöillä* on punainen tukka.
MM: miten tiedät että on *tytöillä*?
VM: *tytöillä*. konsonanttivartalo, hmm, ei, vokaalivartalo on *tytö*, hmm, astevaihtelu, kaksi yksi tee, on *tytöillä*. (reads:) pidätkö sinä hmm, mikä mitä jaa juu elatiivi, onko elatiivi, *punai punaisesta* tukasta.
MM: miksi sinä kysyt onko se elatiivi kun se on *sta*?
VM: elatiivin pääte on päätä *sta stä*. hmm, konsonanttivartalo on *punais*, genetiivi on *punais*, genetiivin vartalo on *punaise, punaisesta*.
MM: hmm, hyvä. ja
VM: ja *tu tukka*, astevaihtelu, kaksi kaksi kokko [koota] on tukkasta
MM: hyvä hyvä
VM: (reads:) virtasen talo on, on *jo,en* rannalla. *kaa, koo* kato katoaa katoaa astevaihtelu
MM: *joen*, mistä
VM: öö, *ii, ii* muuttaa *e*:ksi. *joki* on varmasti vanha sana. niin kuin *suomi suomen*.

VM: (reads:) the virtanen family has four girls. hmm, here is (gesticulates) i don't know what.
MM: brackets. it is in brackets.
VM: no. family. (draws the sign for initial consonant lengthening.)
MM: ahaa, yes yes, that, that has the initial consonant lengthening.
VM: (reads:) all girls have red hair.
MM: how do you know that it is *tytöillä* 'girls, adess.pl.'?
VM: *tytöillä*. consonant stem, hmm, no, vowel stem is *tytö*, hmm, consonant gradation, two one *t*, is *tytöillä*. (reads:) do you like hmm, what what yes yes elative, is it elative *punai punaisesta* 'red' hair.
MM: why do you ask if it is elative when it is *sta*?
VM: the elative ending is ending *sta stä*. hmm, the consonant stem is *punais*, genitive is *punais*, genitive stem is *punaise, punaisesta*.
MM: hmm, good. and.
VM: and *tu tukka* 'hair', consonant gradation, two two kokko [k's] is *tukkasta* (pro tukasta, elat.sg.)
MM: good good.
VM: (reads:) the virtanen house is, is by the river (*jo,en* 'river, genit.sg.' *kaa, koo* disappearence, disappears disappears, consonant gradation.
MM: *joen* , where
VM: öö, *ii, ii* changes to *e*. *joki* 'river' is surely an old word. like *suomi suomen* 'Finland, nominat.sg. genit.sg.'

This learner uses the information she has been taught: she is aware of the features of the words which affect inflection and uses grammatical terminology (*astevaihtelu* 'consonant gradation', *elatiivi* 'elative', *vokaalivartalo* 'vowel stem'). She even employs historical information in reasoning for the *i:e* change in *joki*. Her own comment describes her situation: *minä pidän pidän kieliopista mutta minä en tiedä puhua* 'I like grammar but I cannot speak'.

The second speaker, VK, is an Australian woman of the same age. She had finished high school and subsequently spent two years in Finland working at several temporary jobs. She had acquired Finnish almost solely by speaking it in Finland. At the time of the interview she had been attending her first formal course for one week.

(2) VK: se (the test preceding the interview) oli vaikee, se oli tosi vaikee. ne sanat mikä mä jo tiesin se oli aika helppo tehdä, aaa, se oli vaan piti vaan mää joku lauseen sanoin päässä että toimiiks se siinä kun yleensä kuule että onks se oikein tai eiks se oo oikein tai voiko olla, ni lauseen sanoin päässä ja aattelin että se kyllä se aika hyvin menee. mutta ne säännöt ja kaikki on viel niin uusia etten mä vielä muista kaikkia ja osaa käyttää kaikkia että eniten se on se että mitä mä tiedän ja mitä kuulostaa hyvälle.

VK: it (the test preceding the interview) was hard, it was real hard. the words that i already knew it was pretty easy to do, aaa, it was just, one just had to, i said some sentence in my head that does it [the inflected form] work there as generally one hears if it is right or not right or can it be, so i said the sentence in my head and thought that yes it goes pretty well. but the rules and all are still so new that i don't remember all and cannot use all so mostly it is what i know and what sounds good.

– –

VK: mä vain katselen sitä sanaa ja aattelen että mitä se vois käyä että mitä yleensä käy kun on sennäkönen sana ja sitten paan lauseen ja yleensä yleensä sitä kuulee että onks se niinku ees sinnepäin.

VK: i just look at the word and think that how it could go that what generally goes when there is a word that looks like this and then i just put it into a sentence and generally generally one hears if it is more or less like it should be.

– –

VK: sitä mä tein niillä sanoilla mitä oli siinä kokeessaki että mä vertasin että jos oli semmonen sana mikä mä tiesin mikä oli kumminkin aika samanlainen ja niitä oli monta siinä että sillai vaan että vertasin niitä että ku ei voi olla eri sääntö jos on niin samanlainen sana.
MM: mistä kohti sen sanan pitää olla samanlainen, alusta vai lopusta vai keskeltä?
VK: no ei voi olla hyvin paljon siihen eroo että no tää on aika helppo kun tää (*mesi*) on aika lyhyt sana mutta se alkuvaihe vois, alkupää vois olla vähän erilainen mutta jos loppupää on erilainen niin sitte ei se yleensä toimi että ja keskeltäkin, riippuu sanan pituudestaki, että ei se aina.

VK: that was what i did with those words which were in the test that i compared that if there was a word that i knew and that was pretty similar and there were many there that i just compared as it cannot be a different rule if it is such a similar word.
MM: what part of the word must be similar, the beginning or the end or the middle?

VK: well there cannot be much difference well this one is pretty easy as this (*mesi* 'honey') is a pretty short word but the initial stage, the first part could be a bit different but if the end part is different then it does not usually work and the middle too, it depends on the length of the word too, it does not always [work].

Although the only word which could be considered a grammatical term is *sääntö* 'rule', VK is able to verbalize her strategies quite well. In the first part of the interview she describes her behaviour in the test situation: how she inserted the words she recognized in sentence frames and listened if they sounded right — in other words, compared the form which first came to her mind with the internal representation of the word in question. Over the first week of the course she had become aware that inflectional rules exist and can be formulated, but claims that she is not yet ready to use them. In the second quotation she generalizes her strategy to situations outside the classroom and tests.

In the third part she explains how she compares words not known to her with familiar ones, and if she finds a suitable model, she can be fairly sure of the correct inflection since "it cannot be a different rule if it is such a similar word". When prompted she can explain that it is the end of each word which is crucial in determining the inflection.

All the informants were not comparable to these two in their language awareness. A couple of learners had difficulty in understanding what was expected of them and required so much prompting that it was hard to judge whether they were really expressing their own ideas or only agreeing with those of the interviewer. One Japanese informant was not able to express his thoughts about such an abstract topic in Finnish clearly enough for any conclusions to be drawn, and did not speak much English either.

Most learners, however, displayed awareness of some of their production strategies. They can be divided into two groups of roughly equal size: those who, like VM, were very aware of grammatical rules and avoided having to produce forms that they did not yet know well enough, and those who claimed that they "trust their ear". In other words, the first group trusted more their declarative knowledge of Finnish, the second group their procedural knowledge, or rather the internal feedback based on it.

Some of the first type of learners were quite explicit in stating their limitations:

(3) MM: (mutta) jos sinun täytyy sanoa monikko?
J: aah, minä sanon yksikö. ja minä tiet [tiedän?] jos on nominatiivi monikon mutta partitiivi moniko ja kaikki, kaikki muuta asiat ei tiedä.

MM: (but) if you must say the plural?
J: aah, i say singular. and i know if it is nominative plural but partitive plural and all, all other things don't know.

MN: aaa, esimerkiksi ää kirjoittaminen aa minä voin lu- luittaa [lukea] sanasto mmm minäs [voin katsoa] sanakirjasta, sanakirjastani mutta puhumine on puhu puhumine puhumisessa en voi luit sanakirja.

MN: aaa, for instance ää writing aa i can read vocabulary mmm i can [look up words] in my dictionary but speaking i cannot read dictionary.

Others had a clear view of how inflectional information is organized:

(4) PR: se ole systeemi päässä – – ja jeg har jo kategorisert de forskjellige nomen da, det er ikke alltid man husker dem men plutselig så er det. ikke sant du har jo, det her er regler og, nu har jeg gløмt litt – – i vinter, men det blir det når du repeterer da igjen så kommer dem.

PR: it be a system in the head – – i have categorized the different nominals, it is not always that one remembers them but then suddenly one does. you have rules you know and now i have forgotten a little – – in winter, but they come when you repeat them so they come again.

KM: men då har jag med jag har sådana kartor just verben hur man bildar dem vi har med pilar och sånt jag brukar ha det där framför mig så då kan jag gå och titta.

KM: but then i have kind of maps of verbs particularly how one builds them we have those with arrows and such i usually have them in front of me so i can go and look.

One informant, who swiftly corrected his performance when the same item recurred, displayed the application of declarative knowledge in practice.

(5) A: virtasen talo on *jokin* rannella. nyt *joessa* on vain vähän vetta.
MM: miten sinä tiedät että se on *joessa*?
A: luulen että *koo* on vaihtelee. kun minä sanoin siellä (points to the first sentence) en huomatkaa [huomannut], mutta jo toinen
MM: sitten huomasit
A: joo kulla.

A: virtanen's house is by the river (*jokin*, pro joen, genit.sg.) now there is only a little water in the river (*joessa*, iness.sg.)
MM: how do you know that it is *joessa*?
A: i think that *koo* ('k') alternates. when i said there (points to the first sentence) i did not notice but the other time
MM: then you noticed
A: yes.

MacWhinney (1978) claims that language acquisition proceeds by testing forms against feedback, which can be provided by interlocutors or by comparison with existing internal representations. Many informants of the "procedural" group consciously employed the latter policy:

(6) HA: jaa mutta siellä ei kyllä on *mesitä*, ei, se pitää se täytyy olla jaa *mes mesiä*
MM: *mesiä*. sä niin kuin lisäät siihen sen joo. ja ajatteletko sä niin että sä katsot sitä sanaa ja yrität päättää minkälainen pääte tulee vai vertaatko toisiin sanoihin?
HA: mutta siellä ei sopi *me- mesitä*, ei se sopi
MM: se ei kuulosta hyvältä?
HA: ei se kuulosta hyvältä.

HA: oh but there isn't yes there is *mesitä*, no, it should it must be *mes mesiä* (pro mettä, 'honey', partit.sg.)

MM: *mesiä*. like you add that (ending) to it, yes. and do you think in such a way that you look at the word and try to decide what kind of ending it takes or do you compare it with other words?
HA: but *me- mesitä* does not fit here, it does not fit
MM: it does not sound good?
HA: it does not sound good.

H: (tries to form partitive of *järki*) joo, minä tiedän jos, i dunno, *järkeä*
MM: joo joo
H: minä luulen – – se on tunne

H: (tries to form partitive of *järki*) yes, i know if, i dunno, *järkeä* ('sense', partit.sg.)
MM: yes yes
H: i think – – it is a feeling

The learner HA above trusts his ear even when he is offered alternative explanations. Some, like VK in extract 2, find that judging the correctness of a form requires a sentence context. Separate words apparently do not always activate the feedback:

(7) K: hmm, minä vaan, jos siel on vaan sana minä en osaa kuunnella mutta hmm jos se on lause sitten minä kuunne kuuntelen että onko se oikea mutta ei mutta siellä (in the test) ei oli lause ja minulle oli ja vaikea.

K: hmm, I just, if there is only a word I cannot listen but if it is a sentence then I listen whether it is correct but no but there (in the test) was not a sentence and it was hard for me.

It is interesting that all informants who refer to internal feedback as a way of solving inflectional problems use words related to aural functions — ear, hear, listen, sound — even when they are discussing written tasks. Nobody says, for instance, of a word-form that they have just written that it does not look right. The fact that all informants had at least secondary education suggests that, for this type of learner, language is primarily oral.

Although some learners with no formal teaching are able to specify the strategies they use, it is easier for those who have had formal teaching or who, like MN, have studied Finnish from grammars and textbooks by themselves. Formal teaching, however, affects the two types of learners differently: some feel that only declarative knowledge can be trusted while others use it only when automatic processing fails. Various background factors and former experiences are likely to influence the way people view language learning, but their attitude towards "trusting one's ear" is also a matter of personality. This is exemplified by two Swedish female informants of approximately the same age and with very similar backgrounds, both professionally and in learning Finnish. Both had learnt Finnish out of interest, as a foreign language, with no Finnish family contacts. Their fluency and overall ability to use Finnish was also at roughly the same level. Nevertheless, one was convinced that she could trust her ear or her "feeling", as she put it, about Finnish, while the other claimed to possess no such thing. Both chose to discuss the issue in Swedish.

(8) IW: ibland har jag viss känsla, kan ha viss känsla för (finska), jag har en känsla in det är bara så otroligt när jag började lära finska kände jag att det här är nånting som som pa- det stannar (som) i mitt inre, det finska sättet – –
MM: så det verkar intressant att du har en sån där känsla för
IW: en känsla för språket
MM: hur det hur det går när
IW: nånting ja, ibland tar man fel men nånting så har jag känsla för
MM: så du kan kanske gissa hur det skulle vara och lyssna på om det
IW: låter rätt, ja det gör jag, och det märkte jag ganska tidigt när jag började lära finska språket det var så det började, då blev jag mer och mer intresserad

IW: sometimes i have a certain feeling, i may have a certain feeling for (finnish), i have a feeling inside it is just so unbelievable when i started to learn finnish i felt that this is something that stays in me, the finnish way – –
MM: it sounds interesting that you have such a feeling for – –
IW: a feeling for language
MM: how does how does it go when – –
IW: something yes, sometimes one goes wrong but for some things i have a feeling for
MM: so can you perhaps guess how it should be and listen to it?
IW: sounds right, yes i do that, and i noticed that fairly early when i started to learn finnish this is how it started, then i grew more and more interested

MM: tycker du att du har utvecklat något öra för finska så att du kan gissa hur det skulle gå och sen tänka vilka form låter bäst?
KM: nej inte riktigt nej det tycker jag inte utan att det är mera att jag känner igen vissa typord i bästa fall och jag att inte känner igen dom fel, inget öra, nej

MM: do you think that you have developed some ear for finnish so that you can guess how it should go and then think which form sounds best?
KM: no not really no i don't think so rather it is more that i recognize certain type words in the best case and that i don't recognize them wrong, no ear, no.

Two informants explicitly mentioned that there are two ways to learn a language:

(9) MM: men om till exempel du ser ett nytt ord (skriver), som till exempel *mesi* i ordbok hur skulle det vara i partitiv
PR: *mettä* partitiv
MM: hur vet du det
PR: ja fordi at jeg har, hatt et mønster å gå etter, for eksempel *vesi vettä ve-*
MM: så det är analogi som du använder
PR: ja det er man nødt til å, anvende til det blir automatisert

MM: but for instance if you see a new word (writes), like for instance *mesi* ('honey') in a dictionary how would that be in the partitive
PR: *mettä* partitive
MM: how do you know that?
PR: because i have, have had a model to follow, for instance *vesi vettä ve-* ('water', nominat.sg., partit.sg.)
MM: so it is analogy you use
PR: yes one must use it until, use until it becomes automatic

I: koska meillä – – ei ei kuulu suomen kieltä ei ei ei tapaa suomalaisia niin että ei ei se niin käytännön kautta tule

I: because where we are – – no no finnish can be heard no no no finns are met so it does not come with practice.

The first informant, PR, considers explicit study and the skills acquired by use as a continuum: one has to learn grammar first and then, with practice and use, the knowledge becomes unconscious (cf. p. 23). The second speaker regards the two ways as alternatives which become actualized in different settings.

6.2 Learners' views of inflectional strategies

The comments by learners which address the actual inflectional process can be divided into two categories: those which attempt to analyze the inflection process itself and those which reveal strategies to avoid inflection. Both are important in discourse: when inflection becomes a real or imagined obstacle for expression and understanding, successful communicators have other means at their disposal. Such strategies benefit language acquisition since they enable the learner to carry on communication and receive more input. A well-chosen avoidance strategy can even aid in learning the correct inflection if it leads the discourse partner into providing it. However, it is also possible to carry avoidance strategies too far, resulting in fossilized non-inflected interlanguage, which functions only in face-to-face situations, with the support of context and world knowledge and with assistance from the interlocutor.

MacWhinney (1978, 1–6; see also Leiwo 1982, 64–66) has divided the cognitive abilities required for language acquisition into three groups:

(1) mechanical processing, by which he means rote-memorization of unanalyzed forms;
(2) combining (e.g. the stem + suffix); and
(3) analogy.

The first and third alternatives are frequently mentioned by the informants. Examples of using rote-memory:

(1) AS: millä tavalla. ei no se on se on niin että muistaa minkälainen muoto se pittää olla.

AS: in what way. no, well it is so that one remembers what kind of form it must be.

HA: joo mutta *vettä* täytyy muistaa, se kyllä ei mene ei käy lain ajatella – – se se kyllä täytyy muistaa.

HA: yes but *vettä* ('water', partit.sg.) must be memorized, it does not go it does not work to think – – it it must be remembered.

PR: visse ord må man jo lære, utanom

PR: certain words one must learn by heart

MM: miten sä tiedät että tulee *joen*?
VK: taas se on että mää oon varmaan kuullu sen enemmän kun mitään muuta.

MM: how do you know that it becomes *joen* ('river', genit.sg.)?
VK: again it is that I have heard it more than any other (form).

Although there were many such comments, none of the learners suggested that all language acquisition would be memorizing ready-made forms. Rote-memory was reserved for certain problematic forms, particularly those which have little resemblance to other forms of the paradigm. For more regular stem changes, such as *tyttö* : *tytöillä* ('girl', nominat.sg. : adess.pl.), other explanations were offered, such as the explicit mention of consonant gradation, or **tyttöillä* not sounding right.

Analogical processing was often indicated as well:

(2) MM: miten sinä tiedät että se on *punaisesta*?
MN: aa, en muista kielioppia.
MM: mutta tiedät kuitenkin
MN: kyllä on sama kysymy– – *suomalainen suomalaisen*, niin edelleen

MM: how do you know that it is *punaisesta* ('red', elat.sg.)?
MN: aa, i don't remember grammar.
MM: but yet you know.
MN: yes it is the same issue *suomalainen suomalaisen* ('finn', nominat.sg. genit.sg.), and so on.

MM: mutta jos sinulla on uusi sana esimerkiksi on sellainen sana kuin *mesi* sanakirjassa
KM: aja ajatele se se on kuin *vesi*.

MM: but if you have a new word for instance there is such a word as *mesi* ('honey') in the dictionary
KM: i think it it is like *vesi* ('water', nominat.sg.).

MM: jos sulle on ihan outo sana niin kuin täällä (testissä) on, on paljon outoja sanoja, vieraita sanoja, niin miten sä ajattelet mikä se voisi olla?
K: minä etsi suomalaisen sanat joku kuunne, kuunnelee vähän samallai
MM: joo joo
K: alzo, esimerkis siellä (testissä) oli, mitä se oli aaa, et *hesi* sit mä mä a, mä ajattelin *vesi* ja jotai, ja niin etelleen.

MM: if you have a totally strange word like here (in the test) there are many strange words, unfamiliar words, so how do you think what it could be?
K: i look for a finnish word which sound sounds a bit similar
MM: yes yes
K: alzo, for instance there (in the test) was, what was it, aaa, *hesi* then i i, i thought *vesi* and something, and so on.

NT: – – kun näin sanat joka oli niinku samanlaiset niinku *kenkä henkä* mitä se nyt oli niin tuota niin minä pani niin minä panin ne samanlais

NT: – – when I saw words which were like similar like *kenkä henkä* ('shoe', nominat.sg.) what was it now yes well yes i made yes i made them similar

HH: yritän aina miettiä että mitä minä olen oppinut ja onko onko sanoja mitkä minä tunnen että on samatyyppinen tai

HH: i always try to think what i have learnt and if if there are words that i know that are of the same type

One informant actually names her strategy:

(3) VM: hmm, on paljon (consults her dictionary) minun mielestäni on paljon, on paljon (finds the word) *poikkeus*
MM: poikkeuksia
VM: poikkeuksia
MM: no nyt sinä opit uuden sanan, se on *poikkeus* (writes down the word) miten sinä tiedät mikä on sen genetiivi, esimerkiksi, tai partitiivi?
VM: hm, tää on hmm, konsonanttivartalo, mmm, on minun mielestä nyt *poikkeuden*
MM: sä panet sinne *den*?
VM: onko hyvä?
MM: se on *poikkeuksen*
VM: oo
MM: ei se mitään
VM: onks se *rakennus rakennuksen*, joo, analoogia

VM: hmm, there are many (consults her dictionary) in my opinion there are many, are many (finds the word) *poikkeus* ('exception', nominat.sg.)
MM: *poikkeuksia* ('exceptions', partit.pl.)
VM: *poikkeuksia*
MM: well now you learnt a new word, it is *poikkeus* (writes down the word) how do you know what is its genitive for instance, or partitive?
VM: hm, this is hmm, consonant stem, mmm, it is in my opinion now *poikkeuden* (pro poikkeuksen, 'exception', genit.sg.)
MM: you put a *den* there?
VM: is it good?
MM: it is *poikkeuksen*
VM: oo
MM: that's all right
VM: is it *rakennus rakennuksen* ('building', nominat.sg. genit.sg.), yes, analogy.

An interesting feature of this extract is that although I gave the informant the partitive plural form *poikkeuksia* it does not help her deduce the correct genitive form, which includes the same stem. There are two alternative explanations: the informant's attention at the time is directed towards the meaning of the new word. When her attention is shifted to the inflection, she is no longer able to profit from the previous information. In other words, attention to meaning excludes attention to form for the moment. Focusing on form sets the learner into the declarative gear: she uses the rule that she has for *s*-words to produce a form which is phonotactically and analogically possible but does not happen to be the one actually used. Once the correct genitive form is given, she

remembers the model for analogy, which she apparently has learned during her studies.

Another possibility exists with this very grammatically oriented learner: the partitive plural for both *-s:-kse-*words and *-s:-de-*words has the *-ksi-*stem. Thus *poikkeuksia* is not a reliable clue for the genitive; in other words, the informant's solution did not conflict with what she had just heard. Reasoning to this extent, however, is not very feasible in real-time processing. As speakers generally tend to make too few, rather than too many, stem changes between two forms, it could expected that if the partitive plural *poikkeuksia* were available at the time of processing, the first guess for the genitive would be *poikkeuksen*, rather than *poikkeuden*, even if both types have roughly the same number of members (Karlsson 1982b, 201).

The third alternative mentioned by MacWhinney is combining. None of the informants referred to this procedure. This is interesting, since descriptions of Finnish often begin by a statement to the effect that combining is the basic morphological device in Finnish, with examples like *talo + i + ssa + mme + kin* ('house' + pl + 'in' + 'our' + 'too'). Stem changes, word-types, and other paraphernalia are then presented as a chain of exceptions to this primary principle. Although the number of such exceptions is great, it is nevertheless true that a large number of Finnish word-forms can be produced by combining morphemes (see 3.2.3).

The failure to mention combining is even more intriguing in the light of the fact that many of the informants actually produced a large number of forms by this procedure. For correct forms it is not possible to discern what the process was, but deviant products provide ample evidence of this type of processing. It is also very common in test tasks and spontaneous speech samples in general (see Chapters 5 and 7). One of the interviewed informants relied on this strategy in nearly all of his test answers.

Why then do learners not mention combining as a viable strategy in Finnish? One of the reasons is that the majority of the words discussed in the interviews involved stem changes, as did most of those in the preceding test. It may also be that this alternative was not equally promoted by the interviewer in cases where alternatives had to be listed to help informants who had difficulty in understanding the task; it was mentioned in some of the interviewer's prompts but the learners did not respond to them. Unconsciously, both the interviewer and the informants may have considered combining a default strategy not worth mentioning.

Some of the informants did not seem to trust combining as a strategy: the number and frequency of stem changes and the emphasis that they are given in teaching has led them to suspect all words, however simple. This can be seen in the test results: there are many forms with changes where none are needed. The suspicion can also be heard in a remark by one informant:

(4) MM: mites olis esimes *taide* jos ois vaikka genetiivi?
HH: se tulis vaan se *n* tai, mutta se on se täytyy myös miettiä onko se vahva tai heikko, miten ne.

MM: how would for instance *taide* 'art' be if it was in the genitive?
HH: only the *n* would come or, but it is so you must also consider if it is strong or weak, how those (go).

Since MacWhinney's model was originally created to explain first language acquisition, there is no mention there of explicit grammatical rules in morphological production. Adult informants, however, often mentioned them, and some considered application of rules as their primary strategy. In the examples below, a *rule* can mean either a stem change rule of the type found in IP grammars (e.g. a consonant gradation rule) or a certain sequence of reasoning, necessary in the application of WP-type descriptions, which the learners are often taught (e.g. first look at the end of the word and determine the word-type, then recall the inflection of the model word for this type and produce the necessary form according to the model). Such sequences often include analogical procedures, but since learners consider such sequences rules, and the purpose of this section is to elucidate their views, they are here presented together (for a discussion of the relationship between rules and analogy, see Chapter 8.2).

(5) MM: kun sun pitää taivuttaa jokin sana niin miten sä sen teet, millä tavalla sä ajattelet sitä asiaa?
I: jaa sääntöjen mukaan.

MM: when you have to inflect a word so how do you do that, how do you think about that?
I: well, by the rules.

AS: altså jeg vet jo det at, der er jo regler om, om det blir, tre vokaler til slutt, så må man ha en (...) å så der ja det kjenner jeg (...) da bruker jeg dem
MM: så du tänker på sådana regler
AS: hmm
MM: men om det är ett ord som du inte känner till, som du har inte sett förr, tänker du då, hur vet du då vilka regler du behöver?
AS: jo det er det der med vokaltall, om stammen vilken, om hvilken, hvilke bokstaver der, der stammen sluter

AS: well i know that there are rules about, about it becomes, three vowels in the end, so one may have (...) and so well i know that i (...) i use them
MM: so you think of such rules
AS: hmm
MM: but if it is a word which you don't know, which you have not seen before, do you then think, how do you know then what rules you need?
AS: well it is the thing with the number of vowels, about the stem which, about which letters, the stem ends with

MM: kuinka sä tiedät että se on *joen* rannalla?
PR: niin kuin minä tiedän että *koo* menee nolliin.

MM: how do you know that it is by the river (*joen* 'river', genit.sg.)?
PR: well since i know that *k* becomes zero.

PR: nå si at jeg har, jeg har *leipä*, å da sku det vaere, da smen der har jeg svakt *v*, då blir det *leivän*, ja, ja, og flertall partitiv blir jo *leipiä*

PR: well let's say that i have, i have *leipä* 'bread', and then it should be, but there i have weak *v*, then it becomes *leivän* (genit.sg.), well, well, and the partitive plural becomes *leipiä*

MM: esimerkiksi sellainen sana kuin *taide*?
KM: aa se on *ee*-nomen

MM: for instance a word like *taide* 'art'?
KM: aa it is *ee*-nominal

KM: – – talo on *jokin* rannalla, eller *joken* det vet jag inte, *jokin* eller *joken*, men det är nog ett äktfinskt ord det där, *jokin* säger vi, nej då blir det *joken joken*. nyt *jokessa* on vain vähän vettä.

KM: – – the house is by the river (*jokin* pro joen, 'river', genit.sg.) or *joken* i don't know, *jokin* or *joken*, but it is a genuine finnish word this one, *jokin* we say, no then it becomes *joken joken*. now there is only a little water in the river, (*jokessa* pro joessa, iness.sg.).

Grammatical rules are usually taught, but they can also be inferred from previously learnt words:

(6) HH: no minä katson tietysti sen sanan ja yritän miettiä että miten, en minä ossaa selittää, että minkälainen sana se on, minkälaisia ääniä siellä on ja mitä me ruukaamme muuttaa.

HH: well i look at the word and try to think that how, i cannot explain, that what kind of word it is, what kind of sounds there are and what we usually change.

To some learners who firmly believed in rules I expressed my doubts about the feasibility of the application of complex rules while speaking. They, however, considered it possible:

(7) MM: no tuota kun sä puhut niin ethän sä silloin oikeestaan voi jouda ajattelemaan niitä sääntöjä vai ajatteletko sä puhuessa
I: kyllä mää vähän ajattelen
MM: että kun sä puhut niin sä ajattelet että mikäs, tuleeko astevaihtelu vai ei
I: vähän vähän ajattelen sitäkin
MM: hmm
I: no kyllä tutuilla sanoilla se ei enää enää nyt niin pitkä aika se ajatteleminen vaadi mutta periaatteessa mä lähten nin perustietoista

MM: well when you speak so then you cannot actually don't have time to think about the rules or do you think (about them) when speaking
I: yes i do think a little
MM: so that when you speak you think that what, is there consonant gradation or not
I: a bit a bit i think of that too
MM: hmm
I: well with familiar words it is no longer, no longer it doesn't take so long to think about it but in principle i start with basic information

MM: mutta sinä osasit kaksi sääntöä, astevaihtelu ja *i e* vaihtelu (in the inflection of *joki*). ja ne tulivat niin nopeasti. kuinka sinä voit osata ne säännöt niin nopeasti?
VM: hmm, minulla on, minä, ei hmm minä suoritin tenttiä unkarissa öö suomen kieliopista vielä tämä kesällä tämä kesällä.

MM: but you knew two rules, consonant gradation ja *i e* alternation (in the inflection of *joki* 'river'). and they came so fast. how can you know those rules so fast?
VM: hmm, i have, i, no hmm i passed an examination in hungary öö about finnish grammar only this summer this summer.

Most rule-oriented learners started to verbalize rules without any prompting, but in one case the interviewer inadvertently triggered such verbalization. The learner had correctly produced the genitive *kielen* ('language') and kept pointing to the *e* in the stem:

(8) MM: niin se on vokaali
MN: vokaali vaihtelu ää, *ii*loppu *ii*loppua, *ii*loppua, vokaalivaihtelu

MM: yes it is a vowel
MN: vowel change ää, *i*-ending *i*-ending, *i*-ending vowel change

Although most learners had a clear preference for one strategy or another, many also mentioned more than one. This was succinctly expressed by an experienced language learner:

(9) HH: kaikki se on mitä muistaa ja mitä ossaa.

HH: one has everything that one remembers and knows.

Many informants also specified some of the factors which influence the learning of morphology or the choice of a strategy. One of them was frequency of occurrence:

(10) MM: onko *nen*-loppuiset sanat helppoja yleensä?
I: no ei nii, ei niistä nyt vaikeuksia tule. mutta kyllä niitä moni- monikossa voi voi tapahtua. koska koska monikko ei ole niin joka päivä käytössä.

MM: are the words ending in *nen* generally easy?
I: well no, they don't cause difficulties. but they may may occur in plural. because because plural is not in such every day use.

The familiarity of the word was also considered to influence the choice of an inflectional strategy:

(11) VK: niin, no jos en minä ois kuullut tätä ennen kyllä en mä tiiä mitä mä oisin sanonu.
MM:joo
VK: että *punainensta* tai jotain, en oo varma mutta joo.

VK: well, if i had not heard this before i don't know what i would have said.
MM: yes
VK: that *punainensta* (pro punaisesta, 'red' + elat.sg.) or something, i am not sure but yes.

MM: tunnetko esimerkiks tällasen sanan (kirjoittaa)?
VK: *mesi*. en.
MM: no jos sun täytyis sanoa semmonen lause että tuolla on vähän... niin miten sä sanoisit?
VK: että se on *vesi* että se on *vettä* että se on *mettä*.
MM: ahaa, joo joo, että sä vertaat sitä siihen *vesi* sanaan.
VK: joo
MM: kun se on samannäköinen?
VK: ainakin nyt joo kun en mä tiedä mikä se on ja en mä edes tiedä mitä se tarkottaa

MM: do you know for instance this word (writes)?
VK: *mesi*. no.
MM: well if you had to say a sentence that there is a little ... how would you say?
VK: that it is *vesi* ('water', nominat.sg.) that it is *vettä* ('water', partit.sg.) that it is *mettä* ('honey', partit.sg.).
MM: ahaa, yes yes, that you compare it with the word *vesi*.

Some found that the expected pace of production determined how well they were able to perform:

(12) A: se on vaikea mutta luulen että, uks puoli on vaikea mutta, se on nopeasti, nopeasti on vaikea mutta minä osaan kun minä ajattelen ja muistan, luulen että minä osaan, osaan tehdä kaikille.

A: it is difficult but i think that, one side is difficult but, it is fast, fast is difficult but i can when i think and remember, i think i can, i can do all.

PR: ja hvis man har god tid så går det bra, men det kommer – – men det fins her (points to his head), det er bare å få det ut.

PR: well if one has time it goes well, but it comes – – but it is here (points to his head), but it is just to get it out.

As VM in (7), many others found that the amount and recency of their study of Finnish was a factor which affected successful production:

(13) I: no senkin tiedän koska olen katsonut ja opiskellut sen *vesi veden vettä*, ei muuten.

I: well i know that too because i have looked it up and studied it *vesi veden vettä*, (principal parts of the noun for 'water') not otherwise.

KM: det är så man måste snickra och tänka och även om man har lärt det så glömmer man jag kan jag har svårt för det här, lära så komplicerad grammatik.

KM: it is so that one must figure and think and even if one has learnt it one forgets i can i have it difficult for this, to learn such a complicated grammar.

In addition to explaining their inflectional strategies, many informants also described their ways of avoiding problematic words:

(14) HH: mutta useinhan minä sitten yritän käyttää eri sanoja että en ota sen sanan sitten jos on mahdollisuus käyttää mitä me sanomme norjaksi omskrivning.

HH: but often i then try to use different words that i don't take that word then if there is a possibility to use what we call in norwegian omskrivning ('paraphrasing').

IW: jo man försöker att använda det ord man känner till tidigare

IW: well one tries to use the words one knows earlier

A problem can also be overcome by resorting to external assistance:

(15) A: mmm, minä tarvitsen iso sanakirja ja luen esimerkiksi siellä ja kun se oli jos sinä olin ennen koulussa minä kusun opettaja, sano minä sanon panne lauseen uksi lauseen tai nelja lauseen ja hän sanoi, minä otan ja harjoittelen harjoittelen itseni ja sanoin ja sanoin ja sanoin ja sanoin ja uritän käyttää.

A: mmm, i need a big dictionary and i read there and when it was when i was in school before i call the teacher, say i say put it in a sentence one sentence or four sentence and s/he said, i take and practise practise by myself and said and said and said and try to use.

Avoidance strategies were not explicitly requested, rather the opposite, since the purpose of the interview was to reveal inflectional strategies. They do, however, occur in all types of material used in this study — particularly in the form of non-inflection — and will be discussed further as they occur.

6.3 Introspection results and inflectional processes

In general the learners were rather adept at describing their inflectional strategies, in spite of the limitations of their skills in Finnish. The Scandinavians, in particular, resorted to speaking their L1 in addition to Finnish. Most used some grammatical terminology, such as rule, stem, consonant gradation. They also employed vocabulary referring to general cognitive skills such as learn, remember, know, practise and process.

The interviewees were fairly well aware of their own ways of acquiring Finnish. At the intermediate level, which the informants represented, there seemed to be a connection between their descriptions and the first impression obtained of their language skills: those who said that they learn best by speaking and listening usually understood the questions well and spoke relatively fluently, although not very accurately, while those who claimed to rely on rules tended to speak hesitantly but with a high proportion of correct forms. The latter often referred to the system, considered it important to see "the whole", and did not even expect to speak fluently before they had accomplished

that. At a higher skill level the differences seemed to disapper: the three most fluent and accurate speakers (I, HH and VK) displayed different learning styles and backgrounds.

A reason for including introspective data in this study was to examine the respective roles of declarative and procedural knowledge in the learning of inflection. The interview statements indicate, as could be expected, that declarative knowledge is more trusted as an aid to production by those who had learnt Finnish primarily in a formal setting. This was particularly noticeable with the three informants who were in Finland for the first time and consequently had had little opportunity to speak Finnish. The production of the majority of the interviewees, who had a mixed background of living in or frequently visiting Finland and taking courses in Finnish, gave the impression that their processing had become proceduralized, at least partially. When asked about their inflectional strategies, however, they usually explained their behaviour in terms of what they had been taught.

It is particularly interesting, however, that even students who had exactly the same previous instructional experiences, i.e. they had attended the same courses, mentioned different strategies for the same inflectional issues. The personality or cognitive style of the learner seems to affect what part of the explicit knowledge available is retained and employed for production. Finally, there were two learners who were as good examples of spontaneous acquisition as can be found in Finland, where almost all foreigners participate in language instruction. The week preceding the interview was the first formal teaching period for them. Nevertheless, even they displayed declarative knowledge of their production strategies (see, for instance, examples 2 and 7 in 6.1). This, however, cannot be regarded as evidence for inborn declarative skills, but may result from the experience of learning other foreign languages.

In the analysis of the learners' interview statements it is not possible to separate the influence of instruction from other factors. Teachers, textbooks, and classroom practices certainly influence the way people think about their language acquisition. In the case of adults with a fairly long education, the influence is not limited only to their experiences in Finnish classes, but is derived also from other language learning situations. The mere fact that informants use grammatical terminology shows that what they have been taught to do is reflected in what they think they do.

Since formal teaching is not an independent variable in this study in general, for reasons stated in Chapter 1, the interview statements of the learners can only be used as evidence of learners' strategies on a very general level: teaching or no teaching — what do the learners think they do?

On the basis of these interviews it seems that introspection is more useful for surveying general learning strategies than for finding specific inflectional strategies (cf. Wenden 1986). This is partly because learners are more used to thinking and talking about how they study and learn a language than about their actual productive strategies. Inflectional strategies tend to be described either as products of teaching only, or as something that is a matter of the "ear" or "feeling" and cannot be described.

There are, however, some aspects of the interview statements that suggest certain tendencies. According to MacWhinney (1978), analogy is an inflectional strategy of the lowest priority, to be used when rote-memorization and combining (in this order) fail. It is not totally clear what kind of processes are considered analogical by MacWhinney, nor is it clear where the use of explicit rules would fall in his thinking. Nevertheless, even if analogy is narrowly defined as proportional analogy, it seems that for adults analogical strategies are not necessarily the last resort or the one least frequently employed. Producing a memorized form is probably the fastest way of processing for adults and for children, both in L1 and in L2. The learners often referred to memorizing in the interviews, either directly or by saying something like "I just know that word". But when memory fails, analogies seem to come up as the second choice.

The importance of analogical processing in Finnish, as expressed in the interviews, may be due to several factors. One is the teaching tradition: WP descriptions and their applications are common in textbooks and in the material utilized in writing them, and learning based on a WP description is based on analogy. However, it does not need to be accidental that this is the case: it is possible that an extensive use of analogy is a particularly good way to process Finnish. In other words, inflectional strategies may be language-dependent.

In a language like English, with a relatively small amount of morphology to be learnt, there is little need for analogy. What is regular can be produced by combining morphemes. What is irregular, such as the past tense forms or plurals, can be memorized, since they only involve a small number of words. In Finnish, rote-memorization of the entire morphological system is not a profitable technique (see p. 57), even if instances where simple combining can be used are subtracted from the multitude of forms. The importance of analogy in Finnish is also emphasized by the results presented by Skousen (1987), whose computational analogical modelling of language seems to explain at least certain features of Finnish verb morphology very well.

Teaching traditions and the structure of Finnish may not be the only reasons behind the preponderance of analogical strategies in the interviews. It may also be due to the age and education of the informants. MacWhinney is concerned with L1 learning. Analogical strategies are extensively employed in learning and education, and it is thus to be expected that adults are better equipped to use them than children, whether they are taught to use them in a specific context or not.

The extent of the vocabulary available to learners also affects the use of analogy. Early in a spontaneous learning process there are few models to be used. To discover how analogy works in Finnish and to have a reliable basis for analogy, the learner will have to accumulate a large number of words to compare. In a formal learning situation a list of model words to be memorized can be given early, and new words can be classified on the basis of this list. Thus it was often the beginners, learning through formal instruction, on the one hand, and the fluent speakers with a natural acquisition background, on the other, who most often referred to analogical strategies.

Combining is a problematic strategy in Finnish. Although a good number of forms can be produced by simple combining, it is not a strategy much

practised or promoted in teaching since attention tends to be directed to cases where it does not work. In a way, it is the starting point of the whole inflectional system, and learners use it extensively, for better or for worse, but do not really trust it as a strategy, either in these interviews or in my previous experience with learner behaviour. Analogical processing is more trustworthy: if you are sure that you have chosen the right model, you are likely to produce the right form.

Another problematic area is the application of sound change rules. Some learners clearly find such rules beneficial. Whether they actually employ even the simplest ones in production can be neither proven nor disproven by this material, but rules definitely have a role in the feedback cycle of production: the learner can check her/his product against them. All learners do not do this even if they have been taught the same rules, and it is doubtful whether even the most skilful rule-users are able to use multiple rules in oral production. Nevertheless, there seems to be a useful place for rules in the acquisition of Finnish, particularly for those learners who approach Finnish as a mathematical problem rather than a communicative one.

As was shown in Chapter 5, as well as in this chapter, different words tend to be treated differently in Finnish. The test subjects not only acted in this way, but they also expressed this in the interviews. On the basis of all the material presented in these two chapters, it seems that the crucial problem in learning to produce Finnish inflectional forms is to learn to classify lexical items rapidly into different inflectional categories, on the basis of the fastest method of processing the words in question.

7 INFLECTION IN SPONTANEOUS PRODUCTION

In this chapter examples collected from the speech and writing of learners of Finnish will be discussed. The source and coding of the examples is explained in 4.4 and Appendix 3. All utterances from the FSFL corpus with a nominal inflection error have been collected, and a large sample of them are presented as examples.

The spontaneous utterances and the written products of learners are the most natural kind of research data for SL production; after all, people make the effort of learning a new language to be able to understand, speak, read and write. Spontaneous data poses problems for the morphology researcher, however, since speakers and writers use many strategies to avoid morphological problems of which they are aware. Problematic words can be avoided or replaced by others, they can trigger a codeswitch, even cause a topic to be abandoned altogether. Sometimes inflection is not even attempted, but words are used only in the basic form (or in some other, randomly selected form) and word order and contextual factors are relied on to provide the meaning.

The number of morphological errors is naturally influenced by the proficiency level and strategic choices of the informant, but also by the personality and conversational style. Some people speak very carefully, avoid words they find difficult, and limit themselves to very familiar topics. Others seem to want to express their thoughts on many topics and use all the words they have a smattering of, even running the risk of not getting them right. These two types could be called risk-takers and security-searchers. The freely produced data is then necessarily biased in favour of the risk-takers: it is not possible to collect data from people who do not produce the phenomena under scrutiny.

The propensity for risk-taking in language learning may not only be determined by the personality of the speaker but also by cultural factors. People coming from cultures where abundant oral expression is valued and expected of members of the group that the speaker represents are naturally more inclined

to try to express themselves in Finnish than those whose background empasizes silence or a high degree of correctness in speech. These factors are important in teaching but will not be further discussed here, since the focus is on the acquisition of a morphological system, rather than on the learning or communicative strategies of the individual speakers.

The majority of the forms in the FSFL corpus are correct. They provide ample evidence of learning but not much information about what is problematic or about the production processes. For this reason it is the learners' errors which are discussed in this chapter.

In studies of linguistic errors it has been customary to classify and count the items. The data in this study could be classified according to many criteria, such as errors by word-type or by sound change type (consonant gradation, other consonant changes, vowel changes). They could also be sorted into those which involve omission of one or more rules and those which involve an additional rule, one which should not have been applied. Non-inflection could be seen as one type of error and erroneous inflection as another type. Problems can be divided into those which occur in the stem and those where the ending is also affected. Most errors are word-internal, but there are also some which involve more than one word. Errors can also be corrected by the learner, correction may be attempted but not be successful, or they may go unnoticed by the learner. They can also be 'flagged', i.e. marked by some verbal or non-verbal sign of the speaker being aware of them, such as a pause, repetition, or even a comment (for the term *flagging* see Poplack et al. 1987). As there are so many possible classification criteria, it is clear that each error belongs to several classes at once. The borders between both the classes themselves and the criteria on which the classes are based are often quite fuzzy, and classification itself is thus dubious.

In addition to problems of classification there are other grounds for excluding quantitative methods. Reasons for the success or non-success of inflection are not always easy to detect. A correct form can be produced because the learner has memorized it, by application of rules or other devices taught to the learner, or by sheer luck. An erroneous form can also result from many causes. As this is a study of morphological production in relation to the nominal inflection system of Finnish, it is the potential causes leading to errors that are interesting, not the number of errors as such. Nor would such a count provide much information about the general skill level of the learners in question, since morphological skills constitute only a small part of what is needed for succesful communication in Finnish, and learners vary widely in their ability to use other strategies to compensate for shortcomings in this area.

For the above reasons, only qualitative methods of analysis are applied here. The items in the data are presented in groups, but only for ease of discussion and comparison with the data in other chapters. Most morphological errors in Finnish — be the data collected from learners, children or adult native speakers — are errors in stem formation. Errors in endings and in morpheme order are rarer. Word formation in Finnish involves choices at two stages: first (in linear production) for the stem, then for the ending. To present the data and to analyze errors in detail, I will first discuss the problems of stem formation

(7.1) and then other types of problem (7.2). This division is not intended as a statement for the separateness of these problems — the choices definitely influence each other, and it is not certain that they always happen in the above order either — but this division has been chosen in order to focus on one set of problems at a time.

Within each group of errors various ways of analyzing the data are introduced to bring out alternative explanations for the errors. However, the most time-honoured way of presenting data in studies of Finnish morphology, that of going through the total list of sound change rules and word-types item-by-item and giving examples of each if they can be found, has not been attempted. This is because most items on such a complete list do not occur in this data, so many classes would be left empty. Moreover, it is already known, both by many years of observation of learners' behaviour and by the data in Chapter 5, that problems concentrate in certain areas, and it is thus sensible to limit the discussion to these.

Nevertheless, when a large number of learners is studied, their inflectional errors provide some insight into the structure of Finnish morphology. There are certain points in the nominal inflection system which are particularly vulnerable. However, it is not only the areas where errors are often made, but also the ones where they are practically never made, that are interesting, and the data below is commented on from this angle, too.

Other perspectives considered include application or non-application of rules, interaction of word-types, paradigmatic cohesion, the extent and complexity of the error, and the way it is treated by the speaker/writer. Examples are presented with comments about the relative frequency and other relevant matters. Reference will also be made to data from other studies of "exceptional" Finnish, particularly child language.

As in Chapter 5, it is the characteristics of the data that are presented, discussed, and analyzed below. The implications for the description of production processes and strategies and other theoretical questions are only hinted at here when necessary for the suggested explanation. The interplay of the various factors and evidence provided by the data in Chapters 5–7 will be discussed in Chapter 8.

7.1 Errors in stem formation

The errors produced by learners are not randomly distributed over the whole range of the Finnish morphological system. In the singular there are two groups of words that are particularly problematic: the *i/e*-words and the *s*-words. In the plural there are problems with *A*-words as well. Consonant gradation affects nearly all word-types, and will first be addressed separately.

Problems with other word-types are rare. Sometimes a learner may apply a sound change to a wrong group of words, as in *rannella* (pro *rannalla* 'shore', adess.sg. #otmo) or *pöydellä* (pro *pöydällä* 'table', adess.sg. #wi0). An *A* does

change into an *e* in some forms (in the comparison of adjectives such as *kiva* : *kivempi* 'fun' or in passive forms like *ottaa* : *otetaan* 'to take'). Similarly, a vowel needed in the plural causes uncertainty in the singular (cf. the discussion on "the paradigmatic problem potential" in 5.6.):

(1) täyty otta pannukakku *mansikan* tai *mansikonhilloin* kanssa #otfr

pancake must be eaten with strawberry or strawberry jam

Here the *o* which occurs in the plural stem has affected the genitive singular (cf. *mansikoiden*, genit.pl.). On the whole, the number of such examples in the corpus is very small.

The overwhelmingly most common kind of error that learners of Finnish make is the non-application of sound change rules. In other words, they simply tag the suffix onto the nominative. This is natural for several reasons:

(1) Combining two items is a simple and general cognitive principle, used widely in many cognitive tasks, not only in language production.

(2) Combining is assumed to be the simplest procedure in word-form production (MacWhinney 1978, Leiwo 1982).

(3) When the Finnish language is described to learners, word formation is usually presented by examples in which endings are added to word stems. Although reference to stem changes is usually made very early, simple combination is presented as the norm or as the default procedure. This can be explicit (as in Aaltio 1985, 25; Karlsson 1983a, 12–13; The Finnish Experience 1991, 28) or implicit: no mention is made of the inflection system as a whole but the first examples of inflection are words with no stem changes (Lepäsmaa & Silfverberg 1987, 7–9). Some textbooks, however, introduce stem changes practically at the same time as they introduce the concept of suffixation (Nuutinen 1983, 24–28; Hämäläinen 1988, 14, 29).

(4) It makes sense for the learner to use a combining strategy since it works quite often: all the singular forms of nominals ending in vowels other than *e* or *i* can be produced in this way, unless the stem is subject to consonant gradation. Even for the great majority of the *i*-words combining is the correct procedure. Altogether about 43% of the nominals have no stem changes in the singular (see p. 74). No other single strategy works as reliably as combining, so if one has to guess it is sensible to choose the alternative most likely to be succesful.

Theoretically about 57% of all nominals are thus vulnerable to combining errors in the singular. The most frequent error type is the non-application of consonant gradation.

7.1.1 Consonant gradation

The learners from whom the observational data were collected had all had at least some formal teaching of Finnish. Thus they have been taught aspects of consonant gradation. In this chapter I will look at learners' errors as reflections of the misapplication or non-application of consonant gradation rules. However, I do not wish to claim that the examples below are actually produced by rule

application or lack of it; when the term rule is used here, it is only a convenient tool in explaining learners' production problems.

Consonant gradation can be seen either as a phonological or as a morphological phenomenon. These approaches are discussed in 3.2.3. For the learner in the middle of trying to produce a Finnish utterance, however, consonant gradation is neither a matter of closed or open syllables nor a feature of certain paradigmatic forms, but something that affects the word being uttered or written. For this reason consonant gradation errors produced by learners are here seen as results of different kinds of production processes, such as combining or analogy.

Errors in quantitative gradation often pass unnoticed in conversation, since the production of sound length is a problem for many learners and the listener must therefore rely on other cues for understanding. Even when errors are being specifically looked for and detected, it is not always possible to say whether non-gradation is due to morphological or phonological processing problems. The data contains, however, many rather clear examples of non-gradation:

(1) (do you like Finnish food?) joskus esimerkiksi *kalakukkosta* (pro kalakukosta, elat.sg.) #oi00

sometimes for instance *kalakukko* 'a rye loaf with fish inside'

(2) se tyhjentää *postilaatikkon* (pro postilaatikon, genit.sg.) #otmg

s/he empties the mail box

(3) *kaikkilla tuttolla* (pro kaikilla tytöillä, 'all girls', adess.pl.) #otmo

A large number of similar errors are listed by Aalto (1991, Appendix 3) and Hautoniemi (1990, 43–45). The latter also concludes that the non-application of consonant gradation causes more errors than misapplication.

Sometimes gradation and non-gradation alternate within one utterance:

(4) *kuppit* (pro kupit, 'cup', nominative pl.) lasit jaa *kupin* lautaset (lists dishes in a dishwasher) #oi00

cups glasses and cup's plates (saucers)

This kind of behaviour can be due to many factors. The speaker may have *p* and *pp* in free variation, or s/he may have memorized the form *kupin*, but produces the plural by combining. A change in the planning of the utterance can also be involved: the speaker may have started the word with the singular form in mind but changed to the plural when the word was already on its way out. Strategic changes like this can also be found in the utterances of native speakers, although errors in quantitative gradation are very rare among them (Dufva 1992, 63).

More reliable data for non-gradation can be found from the writing of learners, although orthographic errors are always a possibility:

(5) Pekka Pyy soitti kello 12-45, voi tavoittaa hänet *työpaikkallansa* (pro työpaikallansa, 'work place', adess.sg. + poss.suff.) noin kl. 14.30 asti. Sen jalkeen hän on toisessa *paikkassa* (pro paikassa, 'place', iness.sg.) ja hänelle voi soita toiseen numeroon. #wifr

Pekka Pyy called at 12-45, he can be reached at his job about until 14.30. After that he is in another place and he can be called in another number.

(6) Hän on myyjä ruokan *kauppassa* (pro kaupassa, 'store', iness.sg.). #wim0

S/he is a sales assistant at a food store.

(7) takit, pipot, lasten vaateet, *sukkat* (pro sukat, 'sock', nominat.pl.) #wimu

coats, caps, children's clothing, socks

(8) Syksylä saarilla on paljon *mustikkoita, mansikkoita* (pro mustikoita, mansikoita, 'blueberry, strawberry', partit.pl.) vadelmaa, ja sienija. #wifr

In the fall there are lots of blueberries, strawberries, raspberry, and mushrooms on the islands.

An interesting feature of both speech and writing by learners is that the existence of a long sound within a word is recognized, but the length is assigned to the wrong sound. The following may be an example of this:

(9) se oli yllätys tai semmone *tyttöile* (pro tytöille, 'girl', allat.pl.) #oimf

it was a surprise or something for the girls

Errors in reverse gradation are usually also produced by combining:

(10) takit, pipot, lasten *vaateet* (pro vaatteet, 'clothes', nominat.pl.), sukkat #wimu

coats, caps, children's clothing, socks

(11) he ovat *eläkellä* (pro eläkkeellä, 'retired', adess.sg.) #wimf

they are retired

(12) *liiken*vaihtovero (pro liikevaihtovero, 'sales tax', nominat.sg.) #oime

(13) voi olla hyvä tilaisuus parantaa *lomaken* (pro lomakkeen, 'form', genit.sg.) suunitelu tai järjestys #oime

it can be a good chance to improve on the plan or order of the form

Qualitative gradation is much less regular in Finnish than the quantitative system, as was seen in the data in Chapter 5 and as has been shown by other studies (see 3.2.3). The learners' errors of consonant quality are also easier to detect, and thus more reliably reflect their actual ability to handle the language than those of quantity: many learners are much more skilled in handling the required distinctions in the quality of consonants than distinctions of length. This is not only due to the influence of L1 — which for most informants in this corpus does not employ length as a distinctive feature — but also because in the

Finnish sound system length has no absolute values and can only be defined in relation to the length of other sounds within the utterance (see 3.2.3).

Errors in qualitative gradation are mostly combining errors. This is natural, since omission of gradation improves paradigmatic cohesion, which can be severely weakened by sound changes.

(14) otetaa (omenasta pois) keskisieme mitä keskellä on
(interlocutor: siemenkota) *siemenkotat* (pro siemenkodat, 'core', nominat.pl.) ja leikata palaks – – #otmk

take (out of the apple) the middle seed what is in the middle (interlocutor: core) cores and cut to pieces – –

(15) Oli nimenomaan liikuttava kokemus nähtä osa historiasta samana viikona *sotan* (pro sodan, 'war', genit.sg.) voitajan ja häviäjän näkökulmasta. #wife

It was a particularly touching experience to see a part of history during the same week from the viewpoint of the winner and loser of the war.

(16) *peltille* (pro pellille, 'pan', allat.sg.) pistetää enssi voita #otmk

in the baking pan first put butter

(17) Ne (tekstiilitaideteokset) olivat hyvin kauniita ja olivat täynä *luonton* (pro luonnon, 'nature', genit.sg.) väriä ja kudoksia. #wife

They (works of textile art) were very beautiful and they were full of colours and textures of nature.

(18) Kavin asialla *kaupunkilla* (pro kaupungilla, 'town', adess.sg.) #wife

I went to run an errand in town.

(19) Olen vienyt Elinan (tyttäreni) päiväkotiin, mihin hän tavallisella *tapalla* (pro tavalla, 'habit', adess.sg.) ei halua mennä. #wifr

I have taken Elina (my daughter) to the day care, where she does not want to go, as usual.

(20) Sitten Matti kalastaa *ongenvapan* (pro ongenvavan, 'rod', genit.sg.) kanssa. #wime

Then Matti fishes with his rod.

(21) nyt *jokissa* (pro joessa, 'river', iness.sg.) on vain vähän vesiä. kaksi tyttöä istuu rannalla *aurinkossa* (pro auringossa, 'sun', iness.sg.) ja kaksi on vesissä. #otfg

now in the river there is only a little water. two girls are sitting on the shore in the sun and two are in water.

(22) *taideen* (pro taiteen. 'art', gen.sg.) #otfs

Native speakers also sometimes use the same strategy, as is exemplified by the existence of two competing forms *viiveen* and *viipeen* of *viive* 'delay'(< *viipyä* 'to delay').

Paradigmatic cohesion is particularly endangered by the *k:∅* alternation, which affects the structure and shape of the word more than other changes (cf. Martin 1989, 174, Dufva 1992, 62).

(23) jos minä annan malli *poikalleni,* hmm, *poikalleni* (pro pojalleni, 'son', allat.sg. + poss.suff.) asia on aika selvä ja varmaa että hän pystyy selvittää asiat englanniksi #oime

if i give a model for my son, hmm, my son the matter is quite clear and it is certain that he can explain things in english

(24) hän osta ostan ilmapallon *poikalle* (pro pojalle, 'boy', allat.sg.) – – *poikala* (pro poika, 'boy', adess.sg.) on hmm viisi vuotias #oimu

he buy buys a balloon for the boy – – the boy is five years old (cf. the boy has five years)

(25) kun kävin opettaja opettajankoulun kun oli nuo *harjotusaikat* (pro harjoitusajat, 'practice time', nominat.pl.) nin sain mennä saamen tai sinne missä oli saamen kieli #oifs

when i went to teacher teacher college when they had the practice times so i got to go to saami or where there was saami language

(26) (voita on laitettava uunivuokaan) sen taki että se ei pala eikä jää kiini sen *vuokala vuokan* (pro vuoan, 'pan', genit.sg.) pohja ja reunoi. sitten se taikina mikä sekoitta oikein hyvä voi laita *vuokale* (pro vuoalle, allat.sg.) – – kun se jahty se voi otta pois *vuokasta* (pro vuoasta, elat.sg.) #otfr

(butter must be put in the pan) so it does not burn or stick to the pan pan's bottom and sides. then the batter that is mixed real well can be put in the pan – – when it has cooled it can be taken from the pan

(27) – – opiskelija joka ei pysty seisoo *väkin* (pro väen, 'people', genit.sg.) edessä ja antaa puhe #oife

– – a student who cannot stand in front of people and give a speech

(28) Ihmisella kenella on tamoinen maailmankuva on usein epävarma itsestaan ja omista *kykysta* (pro kyvyistä, 'ability', elat.sg.). #wime

A person who has this kind of view of the world is often insecure of him/herself and his/her own abilities.

(29) Hän halua pyydystää haukia koska he syövat *siikat* (pro siiat, 'whitefish', nominat.pl.). #wime

He wants to catch pikes because they eat whitefish.

A similar tendency to keep the stem unchanged can be seen in the following examples, where the irregular inflection of a pronoun changes the word considerably (*joku* : *jollekulle* : *joillekuille*):

(30) hän soi- soittaa *jokulle jokulle* (pro jollekulle, 'somebody', allat.sg.) ja hän kirjoittaa aam kirje #oimu

he cal- calls somebody and he writes aam a letter

(31) minä tarvitsen soita *jokuille* (pro joillekuille, allat.pl.) #oifu

i need to call somebody

Sometimes the vowel quality is changed but not the consonant:

(32) majoriteettikieli se tullee niin päälle, ne on ne *lehtet* (pro lehdet, 'paper', nominat.sg.), sanomalehti ja kirja kirjat ja telkkari ja kaikki #oifs

the majority language it takes over, it is the papers, newspaper and book books and tv and all

(33) *järken* (pro järjen, 'sense' genit.sg.) #otmo

These can be compared with similar forms produced by native speakers, for instance *uusen* (pro *uuden* 'new', genit.sg., by a child, Dufva 1992, 42) and *lumea* (pro *lunta*, 'snow', partit.sg., by a native adult, Itkonen 1976, 53).

Although combining the nominative with the case ending is the prevalent strategy, overgeneralization of consonant gradation in situations where combining would produce correct results is also common. Most errors of this kind affect the illative case.

(34) mies menee *kaapiin* (pro kaappiin, 'closet', illat.sg.) #oifu

the man goes into a closet

(35) Minä tulin kotiin *Haaparannaan* (pro Haaparantaan, 'a town in Sweden', illat.sg.) viime perjantaina viikko sitten. #wifs

I came home to Haaparanta last Friday a week ago.

(36) jyväskylästä *helsingiin* (pro helsinkiin, 'Helsinki', illat.sg.) on lyhyt matka #oife

from jyväskylä to helsinki is a short trip

(37) hän ota kirjettä postilaatikosta ja pane sen *postisäkiin* (pro postisäkkiin, 'mail sack', illat.sg.) #otme

he takes letter from the mail box and puts it in the mail sack

Many additional examples are listed by Hautoniemi (1990, 44) and (Aalto 1991, Appendix 3). In the FSFL corpus, which involves learners at more advanced levels than the above studies, there are also examples of similar errors with the possessive inflection:

(38) Minun *työpaikani* (pro työpaikkani, 'work place', nominat.sg. + poss.suff.) on huoltoasemalla. #wime

My job is at a service station.

(39) Vanha nainen istui *kodinsa* (pro kotinsa, 'home', nominat.sg. + poss.suff.) edessä. #wifs

An old woman was sitting in front of her home.

Over-generalization of consonant gradation is related to a more general tendency to use the genitive stem in the illative case and with possessive suffixes:

(40) Lähtimme meidän *uudeen* (pro uuteen, 'new', illat.sg.) kotiimme missä ystäväni Kerttu tarjosi kahvit koko porukalle. #wife

We left for our new home where my friend Kerttu served coffee to the whole gang.

(41) Eilen Tuula ja minä menimme *kahdeen* (pro kahteen, 'two', illat.sg.) näyttelyyn. #wife

Yesterday Tuula and I went to two exhibitions.

(42) *Laiskuudeni* (pro laiskuuteni, 'laziness', genit.sg. + poss.suff.) vuoksi olen laiminlyönyt gramatiikan yksityiskohtien oppimista, mitä nyt kadun. #wime

Due to my laziness I have neglected learning details of grammar, which I now regret.

(43) hänen *kädensä* (pro kätensä, 'her hand', nominat./genit.sg. + poss.suff.) #oimu

(44) Hän tykkää kovasti pelamisesta ja aina halua hänen *vanhemmansa* (pro vanhempansa, 'parents', nominat.pl.) osallistua peliin. #wimf

He likes playing a lot and always wants his/her parents to participate in the game.

The illative is exceptional in that the strong stem is used. All other local cases are based on the weak stem. Similarly, adding a possessive suffix cancels the consonant gradation rules in certain cases and causes some forms to become homonymous:

paikka : 'place'	*paikan* : genit.	*paikkaa* : partit.	*paikkaan* illat.
paikkani : 'my place'	*paikkani* : genit.	*paikkaani* : partit.	*paikkaani* illat.

The complexity of the system is naturally one cause of the errors above. A few errors of this kind were also found by Yli-Vakkuri in her study of matriculation examination essays (1992, 81): hänen oman *navansa* (pro napansa, 'navel', genit.sg. + poss.suff.); harmaan *arjemme* (pro arkemme, 'every day', genit.sg. + poss.suff.) keskellä 'in the middle of our grey everyday work'; sirpaleet repivät hänen *kyljensä* (pro kylkensä, 'side', genit.sg. + poss.suff.) auki 'splinters tore up

his/her side'. Dufva also quotes a form aikasemmat *tiedonsa* (pro tietonsa, 'knowledge', nominat.pl.) 'her/his earlier knowledge' (Dufva 1992, 62).

With learners, such errors can also be directly related to teaching. As the genitive is nearly always taught before the illative, and forms without possessive suffixes precede the ones with them, the first learned weak grade forms tend to be overgeneralized to the forms learned later, even when the later form can actually be produced directly from the nominative by the simpler strategy of combination.

A more unusual error is extending the unvoiced:voiced relationship from *t:d* to *k:g*:

(45) *jogin* (pro *joen*, 'river', genit.sg.) rannalla #otmj

by the river

Although this can be a genuine extension of the rule — some learners, when asked, actually describe the system in this way — it is also possible that the learner has read about the historical development of consonant gradation and confuses this information with the synchronic system.

Consonant gradation can also be overgeneralized to words which contain a consonant subject to gradation, but in a position out of reach of the effects of the endings (i.e. not at the border between the last and second last syllable): *kerrause* (pro kertauksen, 'repetition', genit.sg., #oi00), *katilan* (pro kattilan, 'kettle', genit.sg., #oifg). Aalto (1991, 15) lists examples such as *latialta* (pro lattialta, 'floor', ablat.sg.), and *viehätävälle* (pro viehättävälle, 'attractive', allat.sg.). Her informant also considers the words *opettaja* 'teacher' and *kappale* 'chapter' to be subject to consonant gradation. The same is true of the following speaker:

(46) (lehdessä on) kirjan arvoste(luja) mutta myös *artikeleta* (pro artikkeleita, 'article', partit.pl.) #oife

(in the magazine there are) book reviews but also articles

Quantitative and qualitative consonant gradation pairs involving the same consonants (such as *kk:k* and *k:Ø*) cause confusion. One learner constantly uses the form *esimeriks*:

(47) heillä on *esimeriks* (pro esimerkiksi, 'example', translat.sg.) isot sellaine mm postikampeinja #oife

they have for example big mail campaigns

Another informant mixes the paradigms of *lautta* : *lautan* 'ferry' and *lauta* : *laudan* 'board':

(48) Me saapumme Helsinkiin *laudalla* (pro lautalla, 'ferry', adess.sg.) 12 elokuuta ja viedämme vikkoa Rantasalmessa ja vikkoa Padasjoella mökeissä. #wime[56]

We'll arrive in Helsinki on a ferry on August 12 and spend a week in Rantasalmi and a week in Padasjoki in cottages.

Sometimes consonants other than *k, p* and *t* are graded, too: *hylly* : *hylyssä, kissa* : *kisalla*. The example below illustrates how the search for the right form leads to the gradation series *lt:ll:l*:

(49) meidän pitäis alkaa järjestää *sisällöt sisältöt sisälöt* (pro sisällöt, 'content', nominat.pl.) #oime

we should start organizing the contents

7.1.2 *i/e*-words

Some features of the inflection of nominals ending in *i* or *e* in the nominative were presented in 3.2.3, as well as arguments for discussing such a variety of word-types under one heading. Below I will discuss errors in the singular forms of the various *i/e*-paradigms. This is not totally realistic from the learners' point of view, since the learner will have to deal with both the singular and the plural simultaneously, at least if s/he has had any naturalistic input, but this choice was made for the clarity of the presentation.

As with consonant gradation, errors of combining are frequent in the *i/e*-words:

(1) Suomea on erilainen kuin muut Pohjolan *kielit* (pro kielet, 'language', nominat.pl.). #wims

Finnish is different from other Nordic languages.

(2) Hän – – pyydystää ison *haukin* (pro hauen, 'pike', genit.sg.). #wime

He – – catches a big pike.

(3) minun *nimini* (pro nimeni, 'name', nominat.ag. + poss.suff.) on etunimeni on #oimv

my name is my first name is

(4) 2 dl *juustoraastea* (pro juustoraastetta, 'grated cheese', partit.sg.) #wifr

(5) hänen isä kirjoitti *kirjen* – – ja *kirjessä* (pro kirjeen, kirjeessä, 'letter', genit.sg., iness.sg.) on surullisia uutisia #oifx

her/his father wrote a letter – – and in the letter there is sad news

(6) hän otta hänen tavaran tavaransa ja meni *huoneseen* ja sitten *huonessa* (pro huoneeseen, huoneessa, 'room', illat.sg., iness.sg.) hän ota kaikki tavarat ja panee kaapissa #otma

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[56]Leiwo has a reverse example from child language: *lautat* pro *laudat* (1977, 119).

he takes his/her thing things and went into the room and in the room he takes all things and puts them in the cupboard

Many more errors like the above are presented in Hautoniemi (1990, 47–49: *sanomalehtin* (pro *-lehden* 'newspaper', genit.sg.), *ovia* (pro *ovea* 'door', partit.sg.), *lapsit* (pro *lapset* 'child', nominat.pl.), *perhen* (pro *perheen* 'family', genit.sg.), etc. Errors of combining are also common with children: *lumit sataa* (pro *lumet* 'snow', nominat.pl.), *käsit* (pro *kädet* 'hand', nominat.pl.), *kaksi viisiä* (pro *viittä* 'five', partit.sg.), *ukin venessä* (pro veneessä '(grandfather's) boat', iness.sg.) (Räisänen 1975, 257).

When the lack of change in the vowel is added to that in the consonant, the result is more deviant and thus it hampers communication even more:

(7) Aloin kävälla *länsille* (pro lännelle,[57] 'west', allat.sg.) mutta en voi löydä meidän tietämme. #wifs

I started to walk west but I cannot find our road.

Words ending in *-ke* which involve both reverse consonant gradation and a vowel change are particularly vulnerable (see also examples (11)–(13) in 7.1.1):

(8) siis ainakin *lomaken lomaken* (pro lomakkeen, 'form', genit.sg.) suunnittelu on vähän sekaisin #oime

then at least the planning of the form is a bit of a mess

(9) em miä tiijä onko se sieltä menny mitän nais*liikestä* (pro liikkeestä, 'movement', elat.sg.) #oife (refers to information about the women's movement filtering into textbooks)

i don't know if anything has gone there about women's movement

The correct inflection of these words requires two changes in sound length (*liike* : *liikkeen* 'movement'). The reasons for the omission of these changes may be twofold. On the one hand, many learners have difficulty in perceiving and producing the difference between short and long sounds, especially beyond the first syllable and especially when there are two adjoining long sounds. The result may be that they never develop the correct paradigm and treat all *-ke* (and *-te*) words as if their forms could be produced by combining. On the other hand, for those who do perceive the changes in length, they alter the shape and rhythm of the word considerably within the paradigm, thus creating a tendency to keep the stem intact to avoid the disintegration of the paradigm. The same tendency was found in the speech of American Finns (Martin 1989, 189).

In the above examples no sound change rules were applied. Where more than one sound change is needed, the result can also be only partly successful. Learners may apply a vowel change but forget the consonant change, as in the examples (*järken*, pro järjen, 'sense', genit.sg.), or vice versa:

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[57]Syntactically, the form should be *länteen* (illat.sg.).

(10) pidän esimerkiksi eeva *kilvistä* (pro *kilvestä*, elat.sg.) ja eino leinon runoista #oifs

i like for instance eeva kilpi's and eino leino's poetry

(11) minun *veljin* (pro *veljen*, 'brother', genit.sg.) autoni on keltainen #otmr

my brother's car is yellow

Native speakers err similarly: *apin* (pro *apen*, 'father-in-law', genit.sg., Dufva 1992, 65); hakee *lehit* (pro *lehdet*, 'papers', nominat.pl., Räisänen 1975, 256).

Although there are many more *i:i*-words, and this is the productive category which attracts new words, learners sometimes overgeneralize the *i:e*-alternation to *i:i*-words:

(12) oli vain neljä viis *pommea* (pro *pommia*, 'bomb', partit.sg.) #oime

there were only four five bombs

(13) ihan puhdas *paistea* (pro *paistia*, 'steak', partit.sg.) jauheliha rasvaprosentti alle kymenen #oi0

quite pure ground steak fat percentage under ten

(14) minä yritin soittaa erään näiseen ä erään henkilöön mm öö pari *tunnen* (pro tunnin, 'hour', genit.sg.) sitten mutta hän on tällä hetkellä helsingissä #oime

i tried to call a woman ä a person mm öö a couple of hours ago but she is at this moment in helsinki

(15) korkia *vauden* korkia *vauden* juna – – korkia *vaudun vauden* juna (pro *vauhdin*, 'speed', genit.sg.) #oime

high speed high speed train – – high speed speed train

(16) (NOW-järjestö) yritä ainakin vaikutunut aam *vaalen* (pro *vaalin*, 'election', genit.sg.) tilaistu- tilaisuuksien ja – – #oife

(NOW-organization) try at least influenced aam election meetings and – –

Similar examples are quoted from a learner by Hautoniemi (1990, 47): *lasi* : *lasen*, pro lasin, 'glass', genit.sg.; *posti* : *posteen*, pro postiin, 'post', illat.sg.; and from adult native speakers by Dufva (1992, 65): *tuolella*, pro *tuolilla*, 'chair', adess.sg.; and from children by Räisänen (1975, 256): auton *kumet*, pro *kumit*, 'tires', nominat.pl.

Rules are normally presented with a direction: declined forms are to be derived from the basic form. Rules which would help the learner to find the basic form on the basis of a declined form which appears in the input are rarely presented in teaching materials. The example below illustrates the lack of such a rule:

(17) tämä suo- suomin *kieltiä kieliä* on pa- paluin (paljon) muuttunut – – minun äiti ja isä *kielti* (pro kieli, 'language', nominat.sg.) on – – ja minu minun minä opiskeliat opiskeliatsin iranissa farsisa (farsiksi) #oimu

this finnish language has changed a lot – – my mother and father language is – – and i studied in iran in persian

For names of languages the partitive is the most commonly occurring case. The learner has not yet memorized the correct form *kieltä*[58], but produces *kieltiä*, which incorporates the *i* of the nominative, the *t* from the partitive, and the *iä* of the partitive plural. He then corrects this to *kieliä*, which is a simple combination of the nominative form and the partitive ending. The *t* remains in the nominative *kielti*, thus preserving the one feature that the learner seems to have learned about this word: there is some alternation between the nominative and the partitive.

Another example of a difficulty in the formation of the nominative is:

(18) (teacher: no kukkula ja harju on sama suunnilleen samankokoisia)
ja sitten *mäe* (pro mäki, 'hill', nominat.sg.) #oims

(teacher: well hillock and ridge are about the same size)
and then hill

Learning to inflect the *i/e*-words requires a good sense of paradigmatic cohesion. Learners vary in their ability in this respect. Some seem to notice no connection between the forms of a word and apply changes randomly for a long time, while others soon develop a sense of connections between the forms. This is exemplified by two learners who had arrived in Finland at the same time and attended the same courses:

(19) virtasen talo on jokin rannalla. nut jokissa on vain vähän *veziä* (pro vettä, 'water', partit.sg.). kaksi tuttoa istuu rannalla rannalla aurinkossa ja kaksi on *vessessä* (pro vedessä, 'water', iness.sg.). #otmo1

virtanen's house is by a river. now there is only a little water in the river. two girls are sitting on the shore in the sun and two are in water.

(20) *mesta* (for mesi 'honey'), hmm, partit, partitiivi on *mesta*
(interlocutor: entä genetiivi)
luulen että *mesen* mutta en varma #otmo2

mesta ('honey'), hmm, partitive is *mesta*
(interlocutor: how about genitive)
i think that *mesen* but I'm not sure

The first speaker changes the stem vowel between the two occurrences (and the pronunciation of the *s* is unstable as well). The second one decides on an erroneous partitive, modelled perhaps after such words as *suuri* : *suurta* 'large' or *kieli* : *kieltä* 'language', and forms the genitive that is a possible part of the same paradigm. The fact that the *-si*-words do not fit this paradigm was clearly not known to either this learner or several others, who also produced the

[58]Using a partitive form as the subject of a sentence of this type is a very common error at the intermediate and even advanced stages of learning Finnish.

genitive *mesen* (pro *meden* 'honey'), even though they suggested the correct partitive *mettä*.

7.1.3 *s*-words and other words ending in a consonant

Unlike the test data, the spontaneous data contain no errors of direct combining in words ending in a consonant. This is partly because most case endings begin with a consonant and tagging them directly onto the nominatives would often make the words unpronounceable. That the learners do not attempt this in writing, either, shows that even those whose morphological skills are still quite limited have an image of the possible shapes or structures of Finnish words. The concept of schema can also be applied here. For words ending in a vowel, combining represents a feasible schema: only about 26% of them contain any sound changes in the singular, so combining is the alternative constantly reinforced by input. For words ending in a consonant there are very few examples which fit this schema (only some partitives can be formed by combining: *olut* : *olutta* 'beer', *kerros* : *kerrosta* 'storey'). So it is possible that the two groups of words are treated differently from the very early stages of learning.

The closest examples to combining are (1) and (2) below:

(1) Mutta minä en pidä Venäjän *hallitusista* (pro hallituksista, 'government', elat.pl.)! #wifr

But I don't like Russian goverments!

(2) Paljon *turistrakennuset* (pro -rakennukset, 'building', nominat.pl.) (on tehty) kelohonkalta. #wims

Many tourist buildings (are made) of pine snags.

In (1) the inflection for loan words is used, which, in fact, practically amounts to combining, with only the usual *-i-* between the consonants to provide a syllable structure to fit the Finnish phonotax. In (2) the added vowel is an *-e-*, which is not used in loans, but is a common stem vowel in Finnish for words which have both a vowel and a consonant stem.

The most frequent error type is the overgeneralization of the *-s:-kse* paradigm:

(3) ota *mahdollisuukset* (pro mahdollisuudet, 'possibility', nominat.pl.) tai ota *tilaisuukset* (pro tilaisuudet, 'opportunity', nominat.pl.) #oime

take possiblities or take opportunities

(4) minulla on vaikea/ kuula ö konsonantin *pituukset* (pro pituudet, 'length', nominat.pl.) tai onko pitkä tai lyhyt #oi0s

i have difficulty in hearing the consonant lengths or if it is long or short

(5) Lisäksi oltiin väsynyt *rikollisuukseen* (pro rikollisuuteen, 'criminality', illat.sg.), huumeriipuvaisuuden, heikentävään infrastruktuuriin, ja poliittiseen sekontumiseen

kristilliseen uskontoon, vaikka on totta että maan kansalla on uskonnon vapaus. #wife

In addition we were tired of crime, drug addiction, weakening infrastructure, and politics being mixed with christian religion, although it is true that the people of the country have freedom of religion.

(6) Näyttelyssä oli nainen tekemassa huopaa. Hän kääri ja muserti *kangaksia* (pro kankaita, 'fabric', partit.pl.) lampimassa vesissa. #wife

In the exhibition there was a woman making felt. She wrung and crushed fabrics in warm waters.

(7) tässä järvessä on paljon haukeja, muikuja ja *ankeriaksia* (pro ankeriaita, 'eel', partit.pl.) #wime

in this lake there are plenty of pike, vendace and eels

(8) Ulkomalaiset *vierakset* (pro vieraat, 'guest/foreign', nominat.pl.). – – enlantilaisen *vieraksen*. Minä en osaa *vieraksen* kieltä. (Schot-Saikku 1992, 237)

Foreign guests. – – English guest (genit.). I cannot foreign language.

In (3)–(5) the words of the *-s:-de*-type and in (6)–(8) the words of the *-Vs:-VV*-type are treated as *-s:-kse*-words. This, again, is an indication of the attraction of this type. The attraction is difficult to explain, as there is no other word-type in Finnish in which *-s* and *-ks-* would alternate, nor is it particularly easy to pronounce. The sound changes of the *-s:-de*-type are more numerous and complex, but the *-Vs:-VV*-type is no more complex than the *-s:-kse*-type. Nor does the frequency of lexemes belonging to this type explain its popularity. One possible explanation could be that it allows the greatest number of different phonological sequences in the stem: in other words, membership of it has the least number of phonological constraints. As to semantic considerations, which are supposed to be the basis of membership in the *-s:-de*-type, many items in this type are no longer immediately perceived as closely connected to the parent word: for instance, *aamuhartaus* 'morning prayers' has become the name of a certain radio programme and is no longer in a very close semantic relationship with the adjective *harras* 'devote, pious', and the consonant gradation *rt:rr* adds to the phonological distance. Such factors may well increase the possibility of words drifting towards the *-s:-kse*-type.

Sometimes learners place the *-s* word in the correct type, but have difficulties within the paradigm:

(9) jarjestää kaikki *kokousksen* (pro kokoukseen, 'meeting', llat.sg.) liittyvät asiat. #wife

to organize all the affairs connected with the meeting

(10) h: sitten minä aloita *vastaanottoksissa* (pro vastaanottokeskuksessa, 'reception centre', iness.sg.) #oimo

then i start in the reception centre

(11) – – pensaita myöskin – – en mä muista pen-
interlocuter: pensas
pensas
another learner: *pensassa* (pro pensaassa, 'bush', iness.sg.) on pieni – – #oife

– – bushes also – – i don't remember pen-
interlocuter: bush
bush
another learner: in the bush there is a little – – #oife

(12) Hemmon äiti on *sairan*hoitaja (pro sairaanhoitaja, 'nurse', nominat.sg.) #wime

Hemmo's mother is a nurse

In (9) the learner has forgotten to remove the final *-s*. This could also be seen as an example of combining, with *-ksen* as a case formative. One of the first words which refugees must learn in Finland is *vastaanottokeskuksessa* 'in an institution where refugees and asylum seekers are first housed'. It is no surprise that some of the sounds are ignored. Similar examples of *d/t/tt*-alternations in verbs are given in Martin 1989, 265–268. In (11) and (12) the *-Vs:-VV*-words are placed in the correct type but only the *-s* is removed, without the lengthening of the stem vowel.

Examples of confusion with a word-type outside the *s*-group are:

(13) *Tarkkaampia* (pro tarkempia, 'exact', comparat. + partit.pl.) tietoja myöhemmin. #wime

More exact information later.

(14) minula on paljon ajatuksia mitä mä haluan niinku saada *suuksta* (pro suusta, 'mouth', elat.sg.) mutta ei ei ne tuu #ot0e

i have many thoughts which i would like to get out of my mouth but they don't come

(15) Nautimme hienosta *palveluudesta* (pro palvelusta, 'service', elat.sg.) ja samppanjasta ensiluokassa #wife

We enjoyed the fine service and champagne in the first class

The adjective *tarkka* : *tarkan* : *tarkempia* 'exact' has been confused with words such as *rikas* 'rich' (*rikkaan* : *rikkaampia*). The double *k* in most forms (all but the singular nominative and partitive) has led the writer to assume a similarity between these two words (*rikkaampi* > **rikka* : *tarkka* > **tarkkaampi*). In (14) *suu* 'mouth' has acquired an extra *k*, as if the nominative ended in an *-s*. The writer of (15) has inflected her self-derived *-s* word **palveluus* 'service' correctly, but unnecessarily since the noun derived from *palvella* 'to serve' for this purpose is *palvelu* 'service'. The existence of another derivative *palvelus* 'favour', with a different but related meaning, may have caused the hypercorrect behaviour.

Although *mies* (*miestä* : *miehen*) 'man' is an extremely common noun (71st in the Frequency Dictionary, Saukkonen et al., 1979, 42) and its forms — albeit exceptional — are usually learned early, occassional errors occur:

(16) sitten yks mies tuli ja hän kysyi että miksi täälä (naistenlehdessä) ei oo mitään *miestä* (pro miehestä or miehistä, elat.sg. or pl.) ja se oli sitte pakko pakko hmm tehdä yhden juttu *miesestä* #oife

then a man came and he asked that why here (in a women's magazine) there is nothing of men and it was then necessary hmm to do a story about men

Problems with the other final consonants apart from *-s* are much rarer. The *-nen*-words (*nainen* : *naista* : *naisen* : *naisia* 'woman') are complex, and erratic forms sometimes occur:

(17) hän annoi rouva *korhonelle* (pro korhoselle 'a family name', allat.sg.) öö lista missä on ruokakin nimet #otma

s/he gave mrs korhonen öö a list where there are names of foods

(18) ma asuin *suomalain* (pro suomalaisten, 'Finnish', genit.pl.) tyttöje kanssa #oimg

i lived with finnish girls

However, *-nen*-words have several advantages which assist learning: they are very numerous, since a noun can be made from any verb with *-minen*, and any name or word indicating a place can have *-lAinen* added to it to make an adjective. NS has over 7,000 *-nen*-words, which is only a fraction of the total potential number. *-nen*-words are also frequent, particularly at the early stages of learning, when the topics of classroom discussion often revolve around nationalities. Also, the *-nen*-paradigm is extremely reliable, the only exception being the number *kymmenen*. For these reasons, errors with *-nen*-words are not at all as common as one might expect on the basis of sound changes alone.

Other *-n* words are often problematic, as was seen in Chapter 5. The errors can be those of the non-application of sound changes, as in *avainilla* (pro *avaimella*, adess.sg. < *avain* 'key') or partial application of changes as in (19):

(19) Soita PEKKA PYYLLE ehdottomasti. Hän on tavattavissa *puhelemella* (pro puhelimella, 'telephone', adess.sg.) 12345 kello 14.30 asti, tai sitten *puhelemella* 54324 illalla. #wifr

Call PEKKA PYY absolutely. He can be reached by the phone 12345 until 14.30, or then by the phone 54324 in the evening.

There are relatively few words ending in an *-l*, *-r* or *-t*, and many of them are infrequent. As with *-n*-words, the most common (such as *olut* 'beer', *lyhyt* 'short', *sisar* 'sister') are often memorized and non-frequent ones avoided. No errors concerning this group were found in the corpus, although they certainly do occur.

7.1.4 Plural forms

In the FSFL corpus very few examples from the speech of foreigners are in the plural. In the speech of Finns, singular forms are 3.7 times more frequent than

plural forms. Similar counts are not equally reliable in the case of learners as it is often difficult to determine whether deviant formations were intended to be singular or plural. Nor can one trust congruence, either with the predicate verb or with other nominals, as an additional indicator of number.

One reason for the small number of examples in the plural is that plural forms are taught considerably later than singular forms, apart from the nominative plural which is based on a singular stem. This practice results in syntactic errors of the nominative being used instead of other plural forms at the early stages of learning, as the learners' need to express themselves is not limited to singular items. Thus some learners in the FSFL corpus had little formal knowledge of the plural formation and also little experience with its use in speech, although all made some attempts towards some indication of plurality. Even when the plural is theoretically familiar to the learner, it may be avoided in speech because learners feel insecure about its formation. Communication in a face-to-face situation also usually succeeds even when plural forms are not used, as the number can be expressed by numerals or other lexical means (*paljon* 'much', *vähän* 'little', *kaikki* 'all', *monta* 'many', etc.), by verb forms, or even by gestures.

In writing, plural avoidance is not as easy if an attempt is made to produce anything but the most simple sentences. In particular, fairly well-educated writers have expectations about how a good piece of writing should look and try not to make it too simple. Moreover, people may feel more confident about their products in writing since they have time to think about the forms.

Some problems with plural forms can be considered to be products of combining:

(1) On paljon lunta ja pelaamme lumi-pallo *sotaja* (pro sotia, 'wars', partit.pl.). #wime

There is plenty of snow and we play snowball wars.

(2) Pesen autoja, *moottoripyöräja* (pro moottoripyöriä, 'motor-bike', partit.pl.) ja *veneja* (pro veneitä, 'boat', partit.pl.). #wime

I wash cars, motor-bikes and boats.

(3) Hemmo on kymmenen vuotta vanha ja hän ole kaksi *velija*[59] (pro veljeä, 'brother', partit.sg./pl.) ja yksi sisko. #wime

Hemmo is ten years old and he has two brothers and one sister.

(4) Hän ei muodosta *mielipideitään* (pro mielipiteitään, 'opinion', partit.pl. + poss.suff.) äkillisesti #wime

S/he does not form his/her opinions suddenly

[59]Learners commonly use plural forms following numbers, as is logical, although in Finnish the correct form in this position is the partitive singular.

(5) erilaista *naisliikeista* (pro erilaista naisliikettä, 'different women's movement', partit.sg.) #oife

(6) minä tarvitsen soita *jokuille* (pro joillekuille, 'somebody', allat.pl.) #oifu

i need to call somebody

(7) Yritän otta vielä *lääkäitä* (pro lääkkeitä, 'medicine', partit.pl.) ehkä huomeenna on parempi olo. #wifP

I'll try to take medicines maybe tomorrow I'll feel better.

In (1)–(6) the plural marker *i/j* and the partitive ending *-(t)A* have been tagged onto the nominative with no concern for the stem changes. In (7) the stem *lääkä-* (pro *lääke* 'medicine', probably a contamination from *lääkäri* 'physician') is followed by an *i* for the plural and a *tä* for the partitive.

With *i:e*-stems it is not always possible to detect the strategy:

(8) vaihtoehto kaikile muile *naislehtile* (pro naislehdille, 'women's magazine', allat.pl.) #oife

an alternative for other women's magazines

In (8) *lehtile* can be interpreted either as a result of combining (*lehti* + allat.), with the plural marker omitted, or as a correct plural stem (*lehdi-*) with consonant gradation omitted.

In the plural, combining is a less reliable strategy than in the singular. Apart from the nominative plural, which is based on a singular stem, the interplay of stem, plural marker and case ending usually involves some changes which exclude combining as a strategy. Only plurals of non-gradation words ending in *-O*, *-U* or *-e* can be produced in that way: *talo* + *i* + *ssa* 'in houses', *kävely* + *i* + *tä* 'walks', *hame* + *i* + *lla* 'on skirts'. In the partitive, genitive and illative, several ending variants complicate the issue further.

Most other plural errors can be seen either as confusions between paradigms or as applications of wrong plural partitive formatives. The *-i:-e-:iA-* paradigm is often replaced by *-ejA*-plurals:

(9) *moneja* (pro monia, 'many', partit.pl.) baareja #oims

many bars

(10) Ja (maanteillä) myös on paljon *hirveja* (pro hirviä, 'moose', partit.pl.) yöllä. #wime

And (on the roads) also there are many moose at night.

(11) Aamupäivänä kävin kaupassa ja ostin *lehtejä* (pro lehtiä, 'paper', partit.pl.). #wifh

In the morning I went to a store and bought newspapers.

(12) tässä järvessä on paljon *haukeja* (pro haukia, 'pike', partit.pl.), muikuja ja ankeriaksia #wime

in this lake there are plenty of pike, vendace and eels

Similar partitive plural examples are available from children's speech: *hiirejä*, pro hiiriä, 'mice' (Toivainen 1980, Appendix); *pikku lehtejä*, pro pikku lehtiä, 'little leaves'; *sienejä*, pro sieniä, 'mushrooms'; *uuseja*, pro uusia, 'new'; *kivejä*, pro kiviä, 'stones' (Räisänen 1975, 257). Adult Finns, however, seldom make such errors, but they may be produced for humorous effect (*mennä päin honkeja*, pro päin honkia, 'to go wrong').

The opposite deviation from standard forms, that of generalizing the *-iA*-partitive to words with the *-i:-i-:-ejA*-paradigm, is common in many dialects of Finnish. Pääkkönen (1993, 27) also gives an example from a matriculation examination: *lajia* pro lajeja 'kinds, species'. Such errors, however, were not found in the FSFL corpus.

Why do learners and children generalize one form and many dialects the other? The reason is probably in the paradigms themselves:

nuoli :	*nuolta* :	*nuolen* :	*nuolia*	'arrow'
luomi :	*luomea* :	*luomen* :	*luomia*	'birthmark'
tuoli :	*tuolia* :	*tuolin* :	*tuoleja*	'chair'.

If the partitive plural formatives are interchanged, the plural and singular partitives are still different in the first two paradigms, whether the word has a consonant stem or not:

nuolta :	**nuoleja*
luomea :	**luomeja*

The difference is greater in words with consonant stems, and many words learned early (and needed in the plural, unlike *suomi*, for instance) have a consonant stem (*pieni* 'small', *suuri* 'big', *kieli* 'language', etc.). In the second group the singular and plural become the same:

tuolia :	*tuolia*

Since the common combination strategy produces *tuolia* for the singular paradigm, it is reasonable for the learner to believe that the plural must be different (as it is in the standard language) and avoid overgeneralization in this direction. In the same vein, *nuolia* and *luomia* look like singular partitive forms, and learners thus attempt to find another alternative. Competent adult speakers, however, are not equally dependent on distinguishing forms as unambiguously plural, as they are able to utilize many contextual cues to keep the singular and the plural apart, such as the forms of attributes and other established collocations (*monenlaisia tuolia* 'many types of chairs', *pöytiä* ja *tuolia* 'tables and chairs', etc.).

In addition to *i/e*-words, *A*-words are subject to errors in the plural:

(13) ne radikalit *ryhmit* (pro ryhmät, 'group', nominat.pl.) sitten liityvät enemän mustat #oife

the radical groups are more joined by the blacks

(14) Ylijäämän he antavat muille kylän *seurille* (pro seuroille, 'society', allat.pl.) tai muille hyville tarkoituksille. #wime

The profit they give to other societies in the village or for other good causes.

(15) En tiedä onko Anteron kiinnostus junamatkailuun kiinnostuksena *junoihin* (pro juniin, 'train', illat.pl.) tai matkailuun, tai molempiin. #wime

I don't know if Antero is interested in train travel or trains or travel or both.

(16) muistakseni jotan kuusikymmentä prosentia *köyheistä* (pro köyhistä, 'poor', elat.pl.) ovat naiset ja lapset #oife

as fas as i remember something like sixty percent of the poor are women and children

(17) olen asunut öö muutamia *paikaja* (pro paikkoja, 'place', partit.pl.) pohjoisen päin kööpenhaminasta #oims

i have lived öö in several places north of copenhagen

(18) Luulen, etta Suomen kielen iso ongelma on sanaston oppiminen, koska *sanot* (pro sanat, 'word', nominat.pl.) ovat hyvin erilaiset. #wime

I think that the big problem of Finnish language is learning the vocabulary because words are very different.

(19) Ammatti*onkijoja* (pro -onkijoita, 'angler', partit.pl.), kuitenkin, on vähän! #wime

Professional anglers, however, are few!

Utterance (13) is an example of how syntactic strategies affect morphological choices: the nominative *ryhmät* 'groups' and the illative *ryhmiin* (required by the verb *liittyä* 'to join') have been combined into *ryhmit*. Another way to interpret the same example is to see it as a product of the echo effect (see 7.2.2).

Extracts (14)–(19) exemplify problems that learners have with the vowel changes which affect the final vowel of two-syllable nominals ending in an *A* (see 3.2.3). Similar errors were found in the test data, both by the learners and the native speakers. In speech there are also slips: I recently noted down the form *pulleja*, afterwards corrected to *pullia* 'buns', partit.pl., from an adult Finn. Dufva (1992, 64) has *ruokoja*, pro *ruokia*, 'foods', partit.pl.; *kauppien*, pro *kauppojen*, 'shops', genit.pl.; and *koulukuntoja*, pro *koulukuntia*, 'schools of opinion', partit.pl., also from adults . From children Toivainen (1980, Appendix) has collected the partitive plurals *muneja*, pro *munia*, 'eggs'; *kiviä*, pro *kivoja*, 'fun'; *häntöjä*, pro *häntiä*, 'tails'. Räisänen (1975, 257) also quotes several other examples, such as *päivöjä*, pro *päiviä*, 'days'; *kynejä*, pro *kyniä*, 'pens'; and Lyytinen (1978, 99) has *kynejä*, pro *kyniä*, 'pens'; *ihanoita kukkeja*, pro *ihania kukkia*, 'wonderful flowers'.

Learners, just like Finnish children and adults, do not only mix the *i* and *oi* stems with each other (*seurille* 'societies', pl.allat.; *junoihin* 'trains', pl.illat.) but also use the *-ei-* plural stem of *i:i*-words for nominals ending in an *-A* (*köyheistä* 'poor', pl.elat.), as the examples above show. For the type *paikaja* 'places', partit.pl. (17), which can be seen as a product of combining, there are no

spontaneous examples from Finns. This may be because there is no group of words which would end in *-AjA* in the partitive plural. A learner in a natural acquisition situation has no model for this type, while a learner who trusts combining as a strategy produces them.

The speaker in (18) has overgeneralized the *-o*-stem to the the nominative plural, influenced perhaps also by the forms of the related verb *sano-* 'to say'. The last example demonstrates the problems with the partitive plural which occur with polysyllabic words ending in an *-A*. These problems may be partly due to descriptions of the plural formation, which are complex and confusing, as will be pointed out in Chapter 8, but the main reason is the inherent complexity of the system.

7.2 Other morphological errors

7.2.1 Choice of the suffix variant

Learners of Finnish mainly encounter syntactic problems with the case endings, centring around the question: What is the right form for this sentence? Morphological errors in Finnish are primarily errors in the stem, as the examples in the previous chapters indicate. Errors affecting the endings themselves are much rarer. One of the reasons is that there is variation only in a few of the case endings (see 3.2.3), and the only errors possible then are mispronunciations or misspellings, usually affecting the length of the consonant in endings such as *-ssA*, *-llA* or *-lle* (see, for instance, example (9) in 7.1.1). Also, since case endings are frequent in the language, their correct forms are usually acquired early.

The plural markers (*-t* for the nominative, *i* for other cases, alternating with *-j-* in certain positions) are seldom confused. Attempts to combine the nominative plural marker with other case endings are rare. Forms such as *ihmisetä* (*ihmiset* 'persons', partit.) sometimes occur when learners need a plural form before they have had a chance to acquire the *i*-variant of the marker, particularly when they are forced to produce something (see Chapter 5.5 for examples) but such forms soon disappear because they get no support from input.

Example (1) demonstrates a problem with the distribution of the two variants of the *-i*-marker:

(1) Naisen kasvonsa vaikkuttavat tutulta, olen varmasti nähnyt hänet uuseissa suomalaisissa ja ruotsalaisissa *muotilehdejssa* (pro muotilehdissä, 'fashion magazine', iness.pl.). #wifr

The face of the woman seemed familiar, I must have seen her in new Finnish and Swedish fashion magazines.

Although errors such as *onkijoja* (pro *onkijoita*, see example (19) in 7.1.4) could also be seen as errors in the choice of the plural marker variant (*j* pro *i*), they are here dealt with as errors in the choice of the partitive plural formative, i.e. they are not classifiable according to the morphological classes of the ending morphemes.

Problems within inflectional formatives are only common in cases which have more than one ending variant. The partitive and the illative, both in the singular and in the plural, are such cases, and in the plural also the genitive. The partitive singular has three alternative ending variants (see p. 67), but the choice of the correct one seldom remains a major problem for learners after the initial stages of learning. This is due to two factors:

(1) Singular partitive forms are quite frequent in input. They are usually learnt early and used actively, since they are required for several syntactic functions.

(2) The nominative singular and partitive singular are always of the same grade (i.e. both either have the strong stem or both have the weak stem). If the nominative is assumed as the starting point for inflection, no attention need be paid to the consonant changes, but it can be directed to the choice of the ending.

The fact that the spontaneous data contain relatively fewer errors in the choice of ending variant than the test data is clearly due to the fact that learners tend to limit their output to words that they know well. Thus, in the test situation they may recognize words as familiar but still be too unsure about their inflection to use them spontaneously. The spontaneous errors in the ending variant of the singular partitive forms affect only the *i/e*-words:

(2) (hän ei ole) erityisesti kinostunut *lapsea* (pro lasta, 'child', partit.sg.) #oimf

(he is not) particularly interested in the child

(3) Oli niin jonkinlaisena voittona että minä ymmärsin *Villettä* (?) (pro Villeä, partit.sg.) ja hänkin ymmärsi sanomastani vähintään puolta. #wime

It was like a kind of victory that I understood Ville and that he also understood at least half of what I said.

(4) sunnuntaina o oli kaks kakskummenta aa *astetta asteistaa* (pro asteista, 'degree', partit.sg.) #otma

on sunday it was twenty aa degrees

Example (2) can be interpreted as either a stem problem or an ending problem. Räisänen (1975, 257) reports a similar example: *kaksi partakonea*, pro *-konetta* , 'razor', partit.pl. If the stem choice is *lapse-*, the correct ending according to the above rules would be an *a*. Choosing the correct ending variant in this case presupposes knowledge of the consonant stem *las-*. Furthermore, the verb *kiinnostua* normally has an elative complement (*lapsesta*), and this may have partly influenced the choice of the form.

The writer of example (3) knows that words ending in and *-e* require the ending *-ttA* but has been unsure about whether it applies to names, as he indicates by his question mark. Since the number of *e:ee*-words is much greater than the number of *e:e*-words, errors of the opposite kind are more common (see 7.1.2). In (4) the speaker produces a correct form *astetta* ('degree', partit.sg.) but has also heard *asteista*, the partitive of the adjective *asteinen*. He is not sure of the correctness of the first form and adds the other, but doubles the partitive ending in the process.

In an interview situation, where the learners were given the word *mesi* 'honey' to inflect in the partitive singular (cf. Chapter 6), the learners exhibit several strategies:

(5) mk: *mettä* #otmj

(6) ha: jaa mutta siellä ei kyllä on *mesitä*, ei, se pitää se täytyy olla jaa *mes mesiä* #otms

oh but there isn't yes is *mesitä*, no, it shall it must be yes *mes mesiä*

(7) a: *mesta*, mmm, partit, partitiivi on *mesta* #otmo

mesta, mmm, partit, partitive, is *mesta*

The first informant uses the model of *vesi* : *vettä* 'water' as she later acknowledges, the second employs combining and notices herself that the first ending variant is not the correct one. A similar form is reported by Leiwo (1977, 217) from a child: *hiekkata* (pro *hiekkaa*, 'sand'). The third informant in (7) produces a form based on a consonant stem, which may partly be modelled after the partitives of the *-s-* and *-nen*-words.

The illative case also has three endings. The fact that the data contain relatively few examples of illative errors is more likely to be due to the effective avoidance strategies of learners and the relatively rare occurrence of the case than to good control of the rules, since classroom experience points to the contrary. For instance, Aalto's informant, who was recorded in teaching situations, produced illative forms like *Joensuun*, pro Joensuuhun; *tuoon taloon*, pro tuohon taloon, 'that house', *Lontoonoon*, pro Lontooseen, 'to London' (1991, 49).

Another factor which reduces the number of illatives in learner language (compared with native speakers) is that its position as the most frequent local case (see 3.2.1) is partly due to the large number of verbs which require an illative complement. Learning the rection of verbs is one of the crucial learning tasks at the intermediate level. Most learners interviewed for the corpus have not yet mastered it, and thus under-use the illative.

Again, the errors produced by learners affect the *i/e-* and *-s*-words:

(8) joki joka kuul- kuu- (kulkee) *pohjoismereen mereseen* (pro pohjanmereen) #oime

the river that runs to north sea

(9) *kauniin* kaktukseen (pro kauniiseen kaktukseen, 'beautiful cactus') (Hautoniemi 1990, 46)

In example (8) the learner produces a correct illative but apparently feels that its 'illativeness' is not clear enough and adds another ending. (9) represents a case where a genitive form including a long vowel is used as an illative. Both errors are fairly common among learners and basically reflect the same process: the learner has an illative schema in which s/he attempts to fit a word. In (8) *mereen* — even if correct for this word — fits the genitive schema of the *e:ee*-words (like *perheen*) and thus gets the illative form of this schema as well. The genitive *kauniin* fits a common illative schema, that of the numerous *-i*-words (*tuoli* : *tuoliin* 'chair'), and the speaker accepts the form as an illative. Räisänen (1975, 257) has similar examples in his study of child language: *huoneen*, pro *huoneeseen*, 'room', *isoon kappaleen*, pro *kappaleeseen*, 'large piece'.

As can be seen in the above examples, the choice of the ending variant is in many ways connected with the choice of the stem. The use of grammatical rules first requires the ability to form the stem, and, at the same time, certain case endings are often said to require a given stem. Since such an ambiguous and complex way of presenting inflection to learners tends to lead to production problems, other ways of approaching the production seem to be more effective, at least for forms which require the application of multiple rules. These possibilities are discussed in Chapters 8 and 9.

7.2.2 Morpheme order, multiple endings, and non-inflection

The order of the inflectional morphemes in Finnish nominals is quite stable: stem + derivational suffix(es) + plural marker + case ending + possessive suffix + clitic(s). Native speakers almost never deviate from this order. There were no examples in the test results presented in Chapter 5, nor have I noted any in spontaneous speech. The only documented morpheme order slip I know of is *ne panikivat sen* (*pani* 'put' + clitic + 3rd pl., pro *panivatkin* 'they put it', Dufva 1992, 69).

Learners sometimes produce morpheme order errors, although less frequently than other types of error. Usually it is the case ending and the possessive suffix that are transposed (see also Martin 1989, 202):

(1) minun loman *lomanin* (loma 'vacation' + 1st sg. poss.suff. + genit.) jälkeen minä tulen tänne suomeen #otmr

after my vacation i'll come here to finland

(2) isä kirjoitti kirjeen tyttelle *tyttenille* (*tyttö* + 1st sg. poss.suff. + allat.) #oifu

father wrote a letter to the girl

(3) Tervesia *vaimonille* (vaimo 'wife' + 1st sg. poss.suff. + allat.)! #wimr

Say hello to the wife!

In *lomani* (< *loman* + *ni*) the genitive ending *-n* and the initial *n-* of the suffix merge, and the nominative and genitive are thus isomorphic. Thus learners often feel the need to add another *-n* to mark the genitive, which in this case is required by the postposition *jälkeen* 'after'. (2) and (3) seem like morpheme order errors, but a more plausible explanation is that the learners' lexicons contain *tytteni* (pro *tyttöni*) and *vaimoni* as unanalyzed items, in which *-ni* does not carry the meaning of the 1st sg. possessive suffix. This is supported by the fact that the expected forms for these contexts would be *tytölleen* and *vaimollesi*, with 3rd sg. and 2nd sg. suffixes, respectively.

The possessive suffix can also be attached to a wrong word:

(4) mun ystävien *piirini* (*piiri* 'circle' + 1st sg. poss.suff.) on suomalaisia #oimf

the circle of my friends consists of finns

This may be a syntactic error — the learner does not know which word should carry the possessive — but it can also be compared to *lomanin* above: the addition of the *-ni* to *ystävien* would seem to devour the genitive ending, and the speaker has solved the dilemma by adding the *-ni* to the next word. The third alternative is that the speaker has considered *ystävien piiri* as a compound (cf. *ystäväpiiri* 'circle of friends'), which would correctly have the possessive suffix added to the last part.

An error similar to morpheme order errors is in example (5). The pronoun *joku* 'somebody' has an exceptional inflection whereby suffixes are added to both syllables (*joku* : *jonkun* : *joillekuille*). This changes the shape of the word so drastically that many learners resort to a simpler inflection:

(5) minä tarvitsen soita *jokuille* #oifu

i need to call somebody

Theoretically, any suffixes could be transposed, not only case endings and possessive suffixes. The data contain, however, no examples of other types of morpheme order errors, nor can I recall any from encounters with learners.

As the pattern above indicates, a Finnish nominal can contain more than one derivational suffix or clitic. The other suffixes must be limited to one. Learners, however, sometimes add more than one case ending:

(6) Ensiksi he tarkastavat huonekalut pienessä kauppassa kaupungin *keskustassaella* (pro keskustassa, keskusta 'centre' + iness. + *e* + adess.). #wime

First they will inspect the furniture in a small shop in the centre of the city.

(7) Hän on vielä *kattollalle* (pro katolla, katto 'roof' + adess. + allat.). #wimr

S/he is still on the roof.

(8) Kyllä *minunesta* (pro minusta, minä 'I' + genit. + *e* + elat.) me olemme oppinut paljon suomea, nyt on pakko harjoitella et ei ynhoita kaikkia. #wifs

In my opinion we have learnt a lot of Finnish, now one must practise so as not to forget everything.

As with *vaimonille* in (3), the most likely explanation is that the writer's lexicon contains unanalyzed forms (*keskustassa, katolla, minun*) which are used as base forms here. Similar examples are also quoted in Martin 1989 (*vanhainkotonassa* 'in old folks' home', *vanhainkoti* + ess. + iness., p. 202) and Leiwo 1977 (*mukavilta poikiilta* 'nice boys', p. 121). The latter is analyzed as a reduplicated partitive.

In the above examples the use of the double case endings is not justified by any semantic considerations. It is, however, conceivable that more than one case ending could be used to indicate several semantic functions which apply at the same time, e.g. the partitive and illative could theoretically co-exist, if the intention is to express the direction towards some but not all destinations in a certain group. Finnish does not take advantage of this possibility, but sometimes learners suggest that case endings, from a semantic view, are not mutually exclusive:

(9) voimmeko sanoa meidät valittiin *johtajiksina* (johtaja 'leader' + pl. + translat. + ess.)? #oi00

could we say we were elected leaders?

The implication in the context seems to be that "we were elected leaders and we are working as elected leaders".

Example (10) represents a more common combination of case endings:

(10) tavallisesti *tyttöjä tyttöjällä* (pro tytöillä, *tyttö* 'girl' + pl. + part. + adess.) on nukkeja ei pojalla #oifu

usually girls have dolls not a boy

The learner needs the plural stem to form the adessive. She searches for it by forming a partitive plural, which is the first form based on the plural stem taught in most textbooks, but fails to remove the partitive ending and change the *j* to an *i*. Similar errors are also frequent in verbs: many learners forget to remove the infinitive marker *-da* and produce forms such as *arvioidan* (pro *arvioin*, 'I estimate', arvioi + inf. + 1st.sg. #oime).

Another common error involving double case endings affects the partitive of nouns which refer to foods or other materials or abstract matters:

(11) suolaa, valkopippuria, *voitaa* (voi 'butter' + part. + part.) #wifr

salt, white pepper, butter

(12) Otetaan kattila pois tulipesästä ja sekoitetaan lisää n. 3-4 teelusikkaa paprika-*jauhettaa* (*jauhe* 'powder' + part. + part.). #wi0

The pot is removed from fire and 3 to 4 teaspoonfuls of paprika powder are stirred in.

Uncountable nouns occur in the partitive form more often than in the nominative. Thus, it is natural that learners sometimes perceive the partitive as the basic form and combine that with another partitive ending. My Canadian Finnish students in Canada, who only had an oral command of Finnish, were sometimes surprised to hear that forms like *voi* 'butter' or *lumi* 'snow' exist at all: in their experience the nouns were *voita* and *lunta*. Similar examples are common with children; I have noted down for instance the following examples: *luntaa* (pro *lunta* < *lumi* 'snow'), *luutaa* (pro *luuta* < *luu* 'bone'), *vertaa* (pro *verta* < *veri* 'blood'). Adult native speakers also often use the double partitive *montaa* (pro *monta* < *moni* 'many'), and Ylivakkuri (1992, 82) presents the examples *rotuaansa* (rotu 'race' + part. + part. + 3rd poss.suff.) and *nuoruuttaansa* (*nuoruus* 'youth' + part. + part. + 3rd poss. suff.) from essays written in the matriculation examination.

The reverse of double case endings is non-inflection. It is naturally quite common, since in the early stages of acquisition the learner may not even know all the case endings yet. Some want to or must begin to speak Finnish before they have had any chance to be exposed to enough input or teaching to be able to figure out the meanings of the endings. Some simply do not care to learn them, but feel that stacking words on top of each other in any form fulfills their communicative needs. Case endings may also be perceived as redundant and omitted for this reason, just as Finns omit articles and prepositions in Indo-European languages (Ringbom 1992, 105).

There are, however, certain word-types which tend to remain uninflected long after other words are inflected. These word-types end in a sound or sound combination which is also used as a case ending. Typical examples are adjectives like *makea* 'sweet' or *tärkeä* 'important' which look like partitives (cf. *mäkeä* 'hill' + partit.) They have a strong tendency to remain in the nominative when used as congruent attributes, as many learners feel that the case ending attached to the headword indicates the intended function and is redundant in adjectives. Another group affected by the same tendencies is the words ending in *-n*, which are perceived as containing the genitive ending:

(13) mä olin työsä siis valvoja tai mikä semmone *neurotinen nainen* (nominat.sg. pro neuroottisten naisten, 'neurotic women', genit.pl.) osastolle #oimf

i worked as an supervisor or something in the ward for neurotic women

Similar examples were presented in Chapter 5 for words like *puhelin*, *onneton*, etc. The phenomenon can be seen as an extension of the genitive schema. A similar schema is presented in Bybee & Slobin 1982 (and discussed widely in other later studies, see MacWhinney 1994, 132). According to them, certain English verbs (*hit* and *cut*, for instance) do not contain a past tense marker of any kind because of the presence of the final dental consonant, which is part of the general past tense schema. This also explains the difficulties which learners have with these verbs. In other words, if the outward appearance of a word by chance resembles the shape of words belonging to a certain class, or even

completely coincides with it, schematic processing tends to take over and confusion arises.

That morphology is affected by syntactic factors is shown by what could be called the echo effect:[60] two adjoining words, usually an attribute and its headword, are inflected so as to rhyme. Since in Finnish adjective attributes and headwords agree in case and number, it often appears to learners that they also have to sound or look the same, and in fact they often do. Problems arise when the learner does not realize that the two nominals are not of the same inflectional type. In examples (14) and (15) the adjective has influenced the headword, while in (16) and (17) it is the other way round:

(14) monta erilaista *naisliikeista* (pro *naisliikettä*, 'women's movement', partit.sg.) #oife1

many different women's movements

(15) Kanadassa meillä on siellä monta erilaista *kulttuureista* (pro *kulttuuria*, 'culture', partit.sg.) #oife2

In Canada we have many different cultures

(16) *moneja* baareja (pro *monia*, 'many', partit.pl.) #oims

many bars

(17) pidätkö sinä *punaista* (pro punaisesta, 'red', elat.sg.) tukasta (4 different speakers)

do you like red hair

The echo effect may also be only partial as in (18) and (19) below or affect the shape of the nominative as in (20):

(18) Molemmat olivät puoliksi kalju, ovat pukeutuneet aivan samanlaisiin *vaateihiin* (pro vaatteisiin, 'clothes', illat.pl.). #wifr

Both were half bald, dressed in exactly similar clothes.

(19) pikuissa *kyläissä* (pro pikku kylissä, 'village', iness.pl.) Hautoniemi 1990, 46)

in small villages

(20) Sinulle soitii joku Pekka Pyy. Hänellä olisi oikein tärkeä ja *kiireä* (pro kiireellinen 'urgent', nominat.sg.) asia sinulle, mistä hän ei halunut minulle sanoa. #wifr

You were called by some Pekka Pyy. He would have a really important and urgent message for you which he did not want to tell me.

Example (17) above can be explained also as a confusion of the partitive form (*punaista*) for the elative form (*punaisesta*). This happens very often in *-nen-*

[60]Laalo (1995) uses the term *schema concord* for the same phenomenon in child language. This term has not been adopted here, since the term *schema* is used here for a more abstract mental pattern.

words, and in *-s*-words (*saapasta* pro *saappaasta* 'from a boot'). The phenomenon can be described as a schema: the elative prototypically (actually always, apart from the word *se*, elat. *siitä*) ends in *-stA*; thus words ending in *-stA* must be elatives. The echo effect can also be found in the speech of Finns; I have recorded expressions like *siniseen kirjekuoreeseen* (pro *-kuoreen* 'into a blue envelope', illat.sg.).

7.2.3 Morphological awareness and conversational co-operation

One factor in morphological acquisition is the learners' awareness of deviations and errors: if the speaker or writer never finds out which forms are correct and which are not, s/he has no opportunity to learn. In many examples presented in 7.1 and 7.2.1–2 the learner does not seem to be aware of the morphological error, or at least there is no sign ("flag", Poplack et al. 1987) of such awareness. The data contain, however, a great number of indicators of awareness of a linguistic problem. Such flags can be prosodic: slowing down the production or changing the intonation to invite feedback, etc. They can also be non-verbal expressions of uncertainty or requests for help. On the linguistic level such hesitation usually appears as interruptions, repetitions or searches for a form.

(1) jos olisin huomannut eta puuttuu jotain so vain *su- öö kielis- kielisisesti tai hmm* ma käytin silloin muutamia sanoja ranskaa #oimf

if i had noticed that something is missing only language-wise or hmm i used then a few words of french

(2) *uskonnttoja uskoumat- usko uskon hmm ntaa uskoa ja hmm jaa monikkoo uskoja* #oime

religions (various false starts for words of the usko-family) yes plural beliefs

(3) minä olen opiskellut englantia lapsesta asti – – minä en ollut *ymm englanti englantilas ymm kieltäs ymm maa* (englanninkielisessä maassa) #oifu

i have studied english since childhood – – i was not english (various false starts)

(4) mitä tarvide voit tilata *tarjoilijad tarjoilald tarjoili-jal-ta.* #otmu

what you need you can order from the waiter

The interlocutor may be more or less directly asked to help:

(5) sanojen onko se *järjetys*? #oimg

words' is it order?

(6) onko joku *s-sieltalla sieltal-*?
interlocutor: sillalla
joku tyttö on sillalla #oifu

is somebody on the *s-sieltalla sieltal-*?
interlocutor: on the bridge
some girl is on the bridge

(7) mies menee *kaapiin kaapiin tai kaapisen kumpi on oikein?* #oifu

man goes into *kaapiin kaapiin tai kaapisen* ('closet') which is correct?

(8) talo myös tien vieressä kaksi poski ei joo ei joo puski *bush* *onko se poski*
(interlocuter: – – pensaita)
pensaita myöskin – – en mä muista pen-
(interlocuter: pensas)
pensas
another learner: pensassa on pieni – – #oife

house also by the road two poski no yes no yes puski bush is it bush
(interlocuter: – – bushes)
bushes also – – i don't remember
(interlocuter: bush)
bush
another learner: in the bush there is a little – –

Some learners have actually told me that they knowingly use a "multiple choice strategy": by listing several alternative forms they make the interlocutor choose the correct one and thus act as a teacher:

(9) meidän pitäis järjestää *nauhoittiminen tai naihoitimisen?* #oime

we should organize the taping

Uncertainty about a form can also be expressed by translating the expression into another language, thus attempting to assure understanding and maybe also inviting the native speaker interlocutor to provide feedback, even to correct if necessary:

(10) *yllättävässesti surprisingly* #oime

The attempt to clarify an ambiguous form may also come from the interlocutor:

(11) sitten on on tietysti se uskollinen juttu että he voivat liityä tämä ii ar ei (ERA = Equal Rights Amendment) uskolisen
(interlocutor: *uskon-?*)
uskon-?
(interlocutor: *uskonnollinen?*)
uskonnollinen joo hmm uskonnollinen joo juttu ja siihen se se on ihan ihan tosi voimakas #oife

then there is that religious thing that they can join this ERA faithful
(interlocutor: *uskon-?*)
uskon-?
(interlocutor: *uskonnollinen?*)
religious yes hmm religious yes thing and that that is really strong

Even when no possibility of misunderstanding exists, interlocutors correct learners:

(12) me voime mennä golfimaan #oife
(interlocutor: *pelaamaan golfia*)

we can go to golf
(interlocutor: to play golf)

Even when requested, corrections are not always heeded, at least not immediately:

(13) onkse *katsela* vai mikä se on
(interlocutor: *kattila*)
otta joku *katsela* kaadessaan #otmr

is it *katsela* or what is it
(interlocutor: *kattila* 'kettle')
take some *katsela* to pour #otmr

(14) jokissa, onko se *joissa* tai?
(interlocutor: *joessa*)
joissa
(interlocutor: joo *joessa*)
se on *joissa*
(interlocutor: *joessa*)
joessa, jaa, se on *joessa* #otms

in a river, is it *joissa* or?
(interlocutor: *joessa*)
joissa
(interlocutor: yes *joessa*)
it is *joissa*
(interlocutor: *joessa*)
joessa, oh, it is *joessa*

The learner in (15) is able to correct the deviant form as soon as he has uttered it, apparently as a result of monitoring, while another learner (16) is not able to use the information provided by the correctly inflected form of the interlocutor:

(15) mepuen *jokin joen* vieressä #oime

by the mepue river

(16) (millaisessa *suhteessa* tämä esimerkiksi kirjeen lähettäjä on kirjeen vastaanottajaan?)
mikä *suhde suhden* hmm minä en osaa käyttää sanaa *suhde* oikein hyvin minä minä ymmärrän mikä se tarkoittaa #oifx

(in what kind of relation this for example the sender of the letter is with the receiver of the letter?)
what *suhde suhden* hmm i cannot use the word *suhde* really well i know what it means #oifx

An interesting feature in (16) is that the learner is able to connect the given form *suhteessa* with the basic form *suhde* but nevertheless fails to use the same stem for the genitive in her own production.

An effect of teaching can be seen in the example below:

(17) hän on sillal lähellä – – *sillan silta sillan* #oife

s/he is near a bridge

In (17) the learner checks the correctness of her production by referring to the paradigmatic forms usually taught for each word (*silta* : *sillan*).

Recognition of morphological problems has a twofold role in language learning. On the one hand, having to frequently interrupt, hesitate and repeat to search for the required form is a handicap. Learners often even perceive it as a worse hindrance to communication than it actually is, particularly if they come from a culture in which the written language and fluently delivered prepared speeches have great social value. The fact that native speakers also stammer, stutter, and stumble in their speech often goes unnoticed, and the learner's inability to speak smoothly may keep him/her from using opportunities to practise.

On the other hand, there are learners who stumble along with very limited linguistic skills and use their interlocutors as a teaching device, either by direct questioning or by planting more indirect prosodic, non-verbal or structural cues in their utterances to elicit help and feedback. Since such learners are likely to advance rapidly, it might also be worthwhile to explicitly teach their strategies to those to whom they do not come naturally.

8 DISCUSSION AND CONCLUSIONS

The aim of this thesis, as was outlined in Chapter 1, is to examine a central area of the Finnish nominal inflection system as a target of learning, and to explore the linguistic and cognitive factors which affect the production of morphological forms by learners. For this purpose the morphological products of learners and their statements about them have been presented and examined in the previous chapters. The data were analyzed to answer one of the research questions: How do learners inflect nominals? Some references were made to possible underlying processes and potential explanatory models. In this chapter these references will be brought together and the implications of the phenomena found in the data will be discussed on the basis of the ideas and models presented in Chapters 2 and 3.

It has become obvious by now that even the core area of nominal inflection is not homogeneous. Its consistency varies along several parameters. These will be discussed in 8.1. The morphological modelling of this heterogeneous substance will be the theme of 8.2, while the possibilities for mental modelling will be discussed in 8.3. The conclusions and implications for teaching Finnish will be presented in the last chapter.

8.1. Nominal inflection as a learning target

The morphological problems encountered by learners are not evenly distributed over the nominal inflection system but concentrate in certain areas. This is not surprising to anyone familiar either with the structure of Finnish morphology or with the speech and writing of learners of Finnish. The data presented in the previous chapters show that problematic areas include the singular inflection of the *i/e*-words, the *-s*-words (and to a lesser extent the *-n*-words), consonant gradation, and plural formation.

Evidence for the concentration of errors in the areas listed above is found in all the data-types utilized here. The order of difficulty of context-free test words, both by percentage of correct answers and by number of different answers, shows that these categories contain problematic features. The distribution of the errors in the spontaneous data shows similar results. These categories also appear in the interviews with learners. Furthermore, the same groups of nominals and the same forms have been found error-inducing, in child language (Kauppinen 1977, Leiwo 1977, Räisänen 1975, Toivainen 1980), in American Finnish (Martin 1989), and in native adult speech (Dufva 1992, Itkonen 1976, Pääkkönen 1993, Yli-Vakkuri 1976, 1992).

What features do these aspects of the nominal inflection system share? They are all subject to change, variation, and alternation. Whatever the name one gives it, or however it manifests itself, these features break the one-form-one-function principle. A word (stem) whose function or meaning has been learnt appears in a different form when the ending is changed, or else a single idea, such as plurality, is expressed by a variety of means.

Even if the one-form-one-function system would be ideal for learners, the fact remains that speakers as individuals must adapt to language as it is. Thus, some areas of morphology are difficult and must be dismantled for further inspection. What makes certain aspects of nominal inflection troublesome for learners?

It is possible to establish several parameters, along which the learning difficulties vary. Some of the items on the list below stem from SLA or cognition research (e.g. Dufva 1992, 208–209), some from morphological research, and most have the support of the practical experience of learners and teachers of Finnish as a Second Language. The last two items on the list, however, are based on the findings of this study alone, as I have not encountered them elsewhere. Thus, factors which influence the acquisition of Finnish nominal inflection by adult learners include:

(1) the morphophonological complexity of the word
(2) the saliency of changes
(3) the frequency of the word, form and word-type
(4) the familiarity of the word
(5) the meaning of the word
(6) the proximity of forms
(7) the ease of category assignment
(8) the potential for problems

These factors are intertwined in many ways, even if they are commented on below one by one. Observations about their mutual interdependence are included in the comments.

(1) The morphophonological complexity of a word is here taken to consist of the number and quality of changes between paradigmatic forms. The number of morphophonological alternations between the basic form and an inflected form, as well as the total number of alternations in the paradigm, affect the success of the inflection. In the test data it was found that the number of changes affects both the success rate and the number of the variants (see 5.3). In

spontaneous production it was again the words with several alternations (as compared to the basic form) that caused problems. The number of alternations in the paradigm as a whole influences the error rate, even when only one or a few forms of the paradigm are explicitly present. This is explored further under point (8).

The length of the word is often interrelated with the number of the changes (see 5.6). This may be due to a derivational suffix, which contains alternating elements (e.g. *isompi* : *isomman; onneton* : *onnettoman*). Many morphological elements provide more space for alternations. This is also one of the reasons why plural forms cause more difficulty than single forms. The length of a word could also be an advantage, if proportional analogy is used for processing: the longer the model, the more secure the base for analogy. However, minimal pairs for longer words are hard to find, and thus the usefulness of this type of reasoning is very limited.

There is no one clear-cut way of counting the number of changes. Mechanically, an addition, omission or replacement of a segment can be counted as one change each, as was done in 5.3. However, a replacement actually consists of an omission and an addition. Should it be counted as two units of change? Furthermore, are all changes equal?

On the basis of the data presented in this study the answer must be that they are not. Morphophonological complexity involves both the number and the quality of changes. With the exception of very frequent items, such as *poika*, the omission of *k* from the stem causes more difficulties for learners than the omission of a member of a geminate consonant (or the disappearance of the feature length, if this is the view adopted of Finnish phonotax). Moreover, it seems that the omission of the stem-final vowel before the plural marker is easier than the omission of *k*, although this cannot be proven by the test data, as the partitive plural forms have the strong grade, and thus the two omissions do not occur in the same set of word-forms.

In consonant gradation, a replacement of a segment is easier than an omission, as is shown by the data in 5.1 and 5.3. However, in plural formation this is not the case, as forms of the type *päiviä* or *kukkia* are generally found easier than forms of the type *laivoja* or *kauppoja*. Thus it is not possible to rate omission or replacement as such for ease of acquisition: a more important factor is what happens to the general shape of the word.

(2) The quality of morphophonological alternations is related to the concept of saliency. This term refers to the perceivability of changes, or as defined in the Competition Model, to the distance of forms (Bates & MacWhinney 1987, 179). The need for the concept is illustrated by the fact that there are also differences within the categories of omission or replacement: not all omissions are equal, nor are all replacements. Some cause more audible or visible changes than others. The perceivability of changes is partly dependent on how the changes affect the syllable structure or rhythmic qualities of the word, and partly on the acoustic or visual properties of the segments. Neither area has been studied with sufficient rigour among the native speakers of Finnish to make it possible to draw conclusions from the behaviour of learners.

Furthermore, the L1 of the learner is very likely to influence the perception of alternations.

The saliency of a change may have two opposite effects on learning. A salient alternation, where the distance between the forms is great, attracts attention, thus helping learners to focus on it. A good example of this are the *-nen*-words, for which the paradigmatic changes are clear. On the other hand, if the members of a paradigm are too different from each other, this may influence cognitive processing, allowing faulty rule applications, associative relationships, or category placements. Many examples of such problems can be seen in the spontaneous data from learners.

On the basis of this data it is only possible to say that the saliency of changes must be included among the potential factors which influence the learning of morphology, but more specific research both into Finnish phonology and the behaviour of learners is needed before the direction and workings of the influence can be established.

(3) To say that the frequency of occurrence of a word or form affects its learning is commonplace: repetition has been an essential part of teaching traditions through the ages. In this study, the effects of frequency cannot be explicitly addressed, as there is no information about the Finnish input received by the learners. Nor do we have the frequency lists of the words or forms of spoken Finnish which are necessary for comparison. Thus the comments on the effects of frequency are here based less on hard facts, which are not available, and more on the present writer's thorough acquaintance with teaching practices and materials in the field of Finnish as a Second and Foreign language as a source of information about the approximate general frequency of the various words and forms.

For the above reasons, frequency of occurrence is used as an explanatory factor in the analysis of data when other factors fail. It cannot be shown that *poika* or *nainen* are well-learnt because of their textual frequency. However, if the forms of *poika* are quite well-known to learners, while the forms of *tauko* are not, reasons which are internal to the morphophonological structure do not suffice. The concept of frequency is also necessary to explain morpheme order errors and multiple endings (see 7.2.2), where a form takes over the position of the basic form in production. For instance, *vaimonille* cannot be explained within the framework of morphological complexity, as *vaimo* would be a simpler base for declension than *vaimoni*. The frequency of this possessive form may thus lead into such an expression.

In addition to the rate of occurrence of words and forms, the frequency of the word-type[61] also needs to be considered if analogical processing is accepted as a valid processing method. Many models for analogy increase the potential for success. This can be seen with the nonce word *hesi*, as compared with *härki*, for instance: both words had an analogical model present in the test, but *hesi*

[61]Frequency of word-type refers to the combined effect of the number of items of a certain type and their frequency of occurrence.

fared better with the help of many very common words of the same type (*vesi, käsi, uusi, viisi,* etc.).

(4) The familiarity of a word is naturally related to the frequency of the word: frequent words are more likely to become familiar. As a concept, familiarity differs from frequency in that it involves the notion of storage. A frequent word may often be seen or heard, but nothing is said about its place in the learner's L2 system. A familiar word is one which the learner can use, either in production or in reception.

Familiarity was explored in the nonce word test and in the interviews, where many informants referred to familiarity as a factor affecting inflectional processing. Spontaneous data is not applicable here, as non-familiar words obviously do not appear. The assumption in the test was that all the real words would be familiar while the nonce words could not be. The hypotheses which underlay this aspect of the test are not unconditionally supported (see 5.6). The interpretation of the results depends on how one defines a correct answer for a nonce word and on the weight given to answers by one informant only.

Another way of testing the effects of familiarity is to test the familiarity of the words first and then have informants inflect them. A problem with this approach is that it is difficult to test the familiarity of words without teaching them in the process. The question of familiarity can also be presented after the test, as was done in the test described in Martin (1992a), and in an *i/e*-word test by Huhtala (1992). In both tests the self-reported familiarity of a word was found to aid inflection.

(5) The most obvious examples of meaning as a factor in inflection are the single partitive forms produced in lieu of the plurals for non-countable words, such as *vettä* or *keittoa* pro *vesiä* or *keittoja*. The relative frequency of these forms may play a part here, but as plurals are generally less frequent than singular forms, it is not a sufficient explanation, or else the same behaviour would occur with countable words as well.

Familiarity, as defined above, involves the meaning of the word. Some forms produced in the nonce-word test reveal an attempt to attach a meaning even to an unfamiliar word. A form without a function is a problem to be solved, just like other deviations from the one-function-one-form principle.

More generally, meaning and familiarity are intertwined. There is no way of telling whether real words produced more correct answers than nonce words because the real words, including at least some forms of the paradigm, were familiar to the informants, or because they knew their meaning and had associations beyond the mere form to aid production.

(6) The physical proximity of a given form to other forms influences inflectional decisions. Examples of the influence of collocated forms, referred to as the echo effect, are listed in 7.2.2. The syntactic structure of Finnish, with agreement between the head noun and its adjectival modifiers, is susceptible to this type of error. The formal similarity of the members of the nominal phrase tends to spread from the case endings to the stems as well.

In a test situation the lay-out of the test task may cause proximity effects. In the test reported in Chapter 5, the nominative cue was on the left, with space for the genitive singular in the middle and for the partitive plural on the right.

The nominatives were listed below each other. This resulted in some errors which are likely to have been caused by the neighbouring items: the genitive form or its stem was used as a basic form for the partitive plural, or the plural form above acted as a model for the one below, regardless of any word-type constraints.

(7) In this list of inflectional influences, the closest related feature to ease of category assignment is saliency. The perceivability of the features which determine category assignment naturally promotes the placement process. The internal structure of the category, however, is also significant.

In Finnish morphology some classic categories with clear boundaries can be located. One example is the words ending in *-nen*, where *kymmenen* 'ten' is the only exception. Similarly, nominals ending in *-O* or *-U* and containing no gradable consonants are a category where stem changes do not occur. Quantitative consonant gradation, where the strong grade appears in the nominative, is also reasonably clearcut, albeit not totally without exceptions.

Many other morphological categories have fuzzier boundaries. Prototypical members behave in a predictable way, while others do not. A good example is qualitative consonant gradation: it is inconceivable for some established Finnish nominals to avoid it, while some words are graded by some people and not by others, and, furthermore, there are other words which never undergo gradation.

An example of a radial structure (see Section 2.1) is the *s*-words. Membership of the category is defined by a common feature, but the stem alternations of the individual members are conventionalized: they cannot be deduced on the basis of any general principle. The *-s:-kse*-words could be seen as more prototypical than others, as they tend to take over (see 7.1.3), but "specific knowledge overrides general knowledge" (Lakoff 1987, 95), and most words in this category maintain their conventional inflection.

Chain stuctures are also common: for example, *vaate* 'an item of clothing' shares formal properties with other two-syllable nominals ending in a vowel, but also with *-s*-words such as *opas* (reverse gradation) and with *-nen*-words (illative forms), not to mention semantic connections.

Ease of category assignment depends on the properties of the word itself and on the properties of the category in question. A prototypical-looking word, say *talo* 'house' or *suomalainen* 'Finn', is easier to place than *mies* 'man', as the latter is not of a common shape nor immediately assignable to any category, except the one broadly defined as *s*-words.

Reverse consonant gradation provides a good example of the influence of categories. Prototypically, the nominative has the strong grade. Hence, a word like *vaate* could be expected to be declined *vaate* : **vaaden*. Specific information must be added: words ending in an *-e* have reverse gradation, hence *vaate* : *vaatteen; sade* : *sateen* 'rain'. How about *fade* 'a slang word for father'? Again, qualifications must be added: slang words are neither graded, nor is the stem vowel lengthened, hence *faden* (not **fateen*).

Another example of problems in category assignment are the nominatives which contain suffix-type material. Words ending in an *-n* have been interpreted as genitives in this data (see *puhelin* and *onneton* in 5.5.3 and example (13) in 7.2.2), but in the course of teaching I have met examples of similar

misstructurings of other forms (such as *kevät* 'spring' as a nominative plural or *kaista* 'lane' as an elative form).

Homonymy avoidance may also be involved in difficulties with placing a word in a certain category. If a word-form first produced seems to belong in a wrong paradigm, a new solution may be sought to avoid this. The result depends on whether the intraparadigmatic or interparadigmatic forces win.

(8) Category assignment presupposes that learners attempt to classify inflectional items. Another way of viewing a word which one must inflect is to evaluate it for its potential for problems, without actually trying to place it in any particular category. Both strategies may result in the same product, but the process is different.

In the minds of some learners the presence of certain phoneme segments or sequences seems to signal: Something must change! Thus the total number of alternations in the paradigm may influence the likelihood of error, even when only one or a few forms of the paradigm are explicitly present and when the form to be produced does not contain any stem changes as compared to the cue. Paradigms with no stem changes may also be affected.

This urge for change may stem from desperation: the learner has come to a point where s/he no longer believes that any stem can remain intact. A good example is *tuoli*, which is much further down in the order of difficulty than was predicted (Section 5.3). Some examples in 7.2.2 (particularly 6–8) also show the tendency to add complications where none exist. Further evidence is provided by the fact that consonant gradation words in the plural are more difficult to produce than the ones without gradation, even if the cue and the plural partitive have the same grade. Category assignment problems tend to affect words whose membership in a given class truly cannot be defined on the basis of the information present, while "the problem potential factor" often affects simple words.

The eight factors listed above are not the only variables which influence morphological production. In addition to the characteristics of individual learners, which cannot be included here, instruction also instigates changes in learner behaviour. Certain errors (see, e.g. 7.2.2) can be traced back to teaching practices.

The learners in this study were at the intermediate level, but even so many aspects of their behaviour did not differ greatly from that of the native speakers. At a higher level of language proficiency, learners sometimes outperform the native speakers in inflection tasks of the type used here because of the formal instruction they have received. They have been taught explicit information about the behaviour of the various word-types — this is after all, at least partly, how they have learned the language. They have experience in analyzing words which they have never encountered before, by looking at the base form and trying to decide which type it represents or which rules could be applied. Finns, on the average, have never heard of word-types or morphophonological rules, and they must trust their native-speaker intuition and general cognitive abilities.

Reasoning of the type above, practical experience, and research (see 2.3.) all indicate that instruction does play a role in language learning. However, its

inclusion in this study would require a totally different methodological approach than the one employed here, and thus further speculation about its influence is beyond the scope of the present study.

No one factor alone explains the errors during the acquisition of inflection. If one did, it would be easy to focus on it and thus aid learning. It is the interaction of these features which explains errors. For the learner, the substance of the Finnish nominal inflection is neither simple nor of an even texture. When attempting to describe it to learners I often find two-dimensional tools, such as a blackboard, transparency, or paper, inadequate. Morphology is not flat.

Morphology, like the structure of language in general, is grounded in the real world: it is an attempt to make order of the chaotic scenery of propositions, intentions, meanings, acts, etc. One way to describe the system is to imagine it as a relief map, depicting the swamps, deserts and mountains of human language.

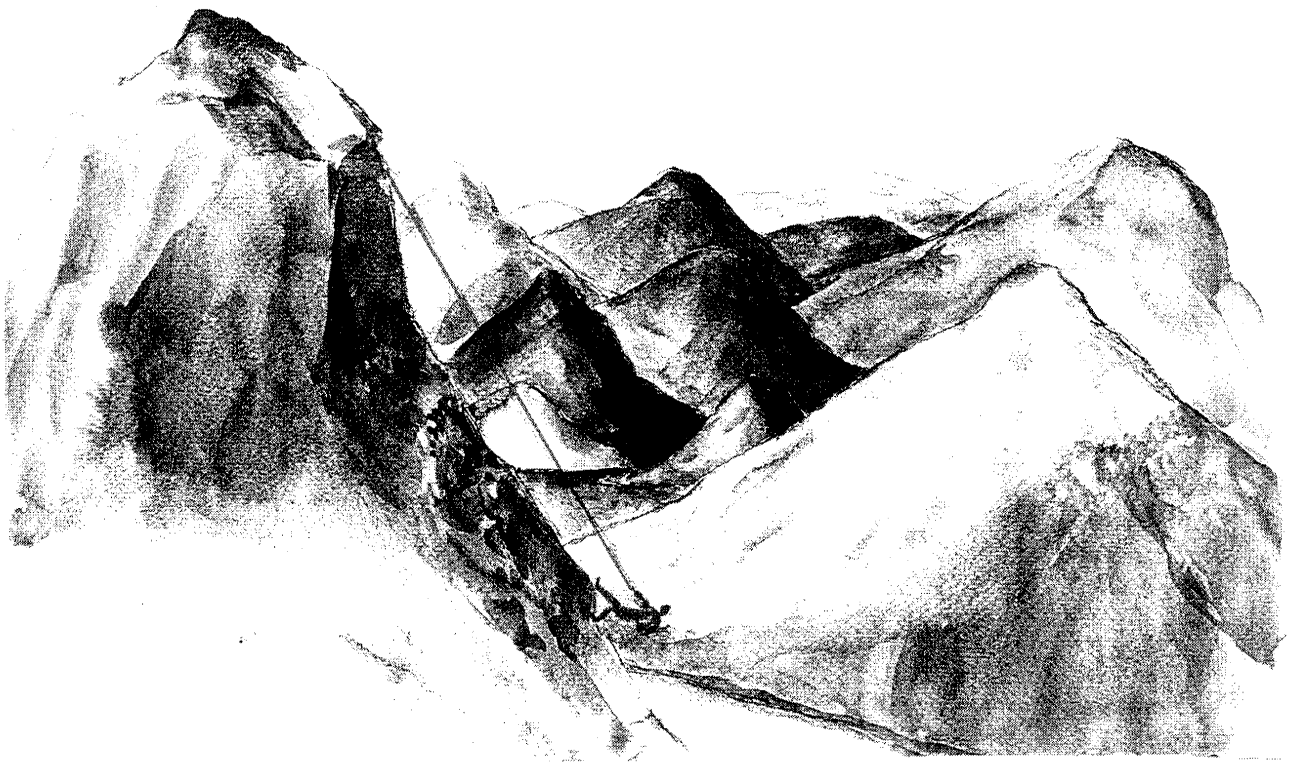
Along one dimension of the Finnish nominal inflection map are the words of Finnish, along the other are their forms, both of them to the extent that they have been acquired at the time of picturing the map. The moulding of the map starts somewhere in the middle, in the core area, with empty space in all directions to accommodate additional information. Whenever a form is seen or heard and connected to an event or item in the underlying real world, it is placed on this map at the intersection of the two dimensions.

Thus, often encountered word-forms which are easily located at a given intersection pile up, forming the third dimension, while forms which are seldom met or which cannot be placed on a certain spot on the map do not. In some areas distinct little hills start to rise, with the valleys between them deep and clear, allowing no or little traffic across. In other areas there are soft indistinct shapes tentatively lying about, sometimes being moved to a new location with the wind caused by an incoming new form. Moving about these shifting areas is uncertain, as one easily slips from the area of one form to another, either in the direction of neighbouring words or towards adjoining forms. Occasionally one falls into the swamp of underlying meanings amd syntactic collocations.

As experience with the language increases, the ground hardens and moulds into a scenery of hills, where some hills are high and steep, and others are connected to each other with gentler slopes. The details of the relief map start to resemble those of proficient native speakers of Finnish, who generally observe even the most gradual transitions from one area to another, although they too occasionally slip. The height and shape of the hills are determined by the parameters of input listed above. Frequency affects the height of the mounds, other factors determine where the incidents of input land and how exactly they stack on top of each other.

Learners, children and other groups whose maps have fainter demarcations, either due to insufficient accumulation of material, or due to erosion, experience difficulty in their linguistic production, although they may be aware of having stepped on the wrong side of the line. The maps of two people never look exactly alike, as they have had different input and located it on their maps according to their own individual classifying principles. Sometimes a hill remains in an unusual spot indefinitely, or acquires an

exceptional shape, regardless of additional input forms of a different shape, as if the learner had pulled a sheet over the map, to prevent further clutter from landing on his/her satisfactory creation.



8.2 Modelling morphology for learners

Learners, teachers and researchers alike tend to search for a unitary system in language. A scholar's motivation is that his/her theory or model will be evaluated by its scope, elegance and economy, which are easier to achieve within a single framework. A teacher and a learner want to find a system which covers all instances of language, since a unitary system can be learned in a uniform way, thus reducing the amount of labour involved in learning to learn.

A disadvantage of a unitary grammatical description is that it is never completely true to language: natural language contains items and variation which serve as counter-evidence. If all of this is included as exceptions, the

uniformity of the grammar is eroded. This dilemma was succinctly expressed by Westermarck (according to Ravila 1949, 2), who noted that "a key which opens all doors is not a key but a lockpick".

Besides uniformity, another basic question to face in the choice of a grammatical theory is universality. Although certain basic ideas (such as rules or analogy as processing devices) may fit the description of all languages, at least their relative significance is irrevocably dependent on the structure of the language or the area or level of the language in question. The lockpick metaphor is equally poignant here.

As I stated early in this study, my choice is an eclectic approach. To start with, this was based on my experience as a teacher and on conversations with other teachers and students, as well as on some previous research efforts of my own and my colleagues. Nor is this standpoint refuted by the data of this study. Most of the behaviour of the learners in the test situation can be explained in several ways, but no one method of explaining it covers all examples. The same is true of the spontaneous data. In the interviews the learners themselves imply or explicitly refer to several models of grammatical explanation.

For these reasons, the purpose of this chapter is to bring together some evidence on the relative merits of different grammatical views in explaining learner behaviour. The criteria include, among others, simplicity and plausibility of explanation. It is also obvious that many, perhaps most, examples in this study can be explained in several ways.

Descriptions of Finnish morphology are not written with learners in mind, and the fit between the description and the psychological reality of native speakers has been considered in varying degrees. For learners, the agreement between cognitive processing and grammatical description is of prime importance. Another problem in evaluating morphological models of Finnish is that important information is missing. The relation between the input of learners and the statistical information available about Finnish can only be approximate, and many aspects of native speaker behaviour are unknown, as has been pointed out in earlier chapters.

Nevertheless, there is a great deal of resemblance between learner behaviour and formal morphology. The evidence from child language, slips of the tongue, or aphasia has been earlier used as an atheoretical proof to show that morphological knowledge exists as described by linguists. Therefore, "formal morphological representations can be used as legitimate working hypotheses when studying psychological morphological representations and processes" (Niemi et al. 1991, 117).

The numerous descriptions of Finnish morphology are here reduced to two classes: those based on rules and those based on the concept of paradigm. As will be seen below, this is only a starting point, however, as neither the models nor the data can be divided along this dimension alone.

The problematic areas of nominal stem formation in Finnish contain two types of alternation: the predictable and the unpredictable. The line between the two is vague. How complex can an alternation pattern be, to be still called predictable? How many exceptions are required for a pattern to cross the line into the unpredictable? Again, classification must be flexible. Prototypically,

quantitative consonant gradation is predictable, while the stem alternations of the *-i*-words are unpredictable. Plural formation is sometimes predictable, sometimes unpredictable.

Predictable behaviour is the natural domain of rules. The primary rule of Finnish morphology is combining: basic form + suffix = new form. From this view all stem changes are exceptional. Overgeneralization of the primary rule is a crucial source of errors in learner production, as is seen in all types of data in this study. There was actually one informant, a participant in both the test and the interview, who systematically used this rule for the production of all plurals and also expressed his belief in this method in the interview. For him it was apparently sufficient for communicative purposes, as he had successfully completed his vocational training in a Finnish school.

The advantage of combining is that it keeps the basic form intact, thus enabling a strong connection between form and function. Combining can also be applied to all word-types, either directly or by adding an *i* or *e* between the final consonant of the basic form and the initial consonant of the suffix. The result is quite often acceptable, and even when it is not, it is usually comprehensible in context.

The rule-based descriptions of Finnish, however, do not usually explicitly consider all other rules as hierarchically secondary to combining. Their starting point is usually at the next level: nominals containing certain phonological features are material for certain rules. Thus the nominal types, where combining works, are listed among the others. This is economical as it flattens the hierarchy of the rules by one level, but it ignores the fact that combining is present in nearly all inflectional processes of Finnish.[62]

An essential feature of rule-descriptions is the hierarchical nature of the rules. In older grammars, rules are often given without a mention of the order of application. The implication is that the main rule must be applied first and the exceptions next, but among the main rules and among the exceptions there is no hierarchy outside the order of presentation. Occasionally, contradictions arise from this. An example would be the rules given by Setälä & Sadeniemi for the plural formation of three-syllable nominals ending in an *A* (1966, 29–30): nominals ending in *-mA, -vA, -mpA* or *-isA* lose the stem-final *-A* when the plural *i* is added; in nominals with an *i* in the penultimate syllable the final *-A* is replaced by an *-O*. For adjectives like *vaativa* : *vaativia* 'demanding' or *sopiva* : *sopivia* 'suitable' the two rules are contradictory, as was pointed out by G. Karlsson (1978, 87).

Another example of a problem in rule order is the choice between *i* and *j* in the plural. A native speaker with a solid intuitive knowledge of possible phonotactic strings may be able to apply a rule like "the plural *-i-* changes to *-j-*

[62]The genitive singular forms of the numbers *seitsemän* 'seven', *kahdeksan* 'eight', *yhdeksän* 'nine' and *kymmenen* 'ten' are copies of the nominative forms. Combining is also not present in all parts of the inflection of forms containing possessive suffixes, as e.g. *kirjani* stands both for the nominative and the genitive of 'my book' and *kirjaani* both for the partitive and the illative of it.

between two vowels" (F. Karlsson 1983a, 65; the same rule is given in many other grammars and textbooks). How is a learner to know when to apply this? The process of plural formation by rules is complex[63] at best: First add the plural marker to see what it does to the stem. Then remove it again and replace it with a new one if you notice that it would be between vowels. But which comes first, this rule or the choice of the partitive or genitive plural ending, which can begin either with a vowel or with a consonant? For example, how should one decide between *talo + i + a > taloja* and *talo + i + ta > *taloita*?

This problem arises because rules only address one issue at a time, while related issues are either ignored or form a set of constraints for the main issue. Thus, rules for plural formation are listed in one place and the choice of case ending in another, as if these two had nothing to do with each other. There is a good reason for this. Many morphophonological phenomena (such as consonant gradation or stem changes associated with *i*-markers) affect both nominals and verbs. Describing them separately from inflection represents a higher degree of generalization. The economy of the model, however, does not coincide with economy for a learner, who needs a form for a certain function.

Nonetheless, rules serve certain learners well in certain areas, as some of my interviewees attested. The determining factors of the usefulness of rules — apart from the cognitive characteristics of the learner, which are not studied here — is the uniformity of the area of application and the transparency of the product. Rules work well in normal quantitative consonant gradation, which is reasonably exceptionless. Reverse gradation depends more on other factors, such as the familiarity of the word.

Qualitative gradation of the most common kind (*katu* : *kadun*) can also be seen as rule-based, but as the alternation rules depend not on the plosive alone but also on the adjoining sounds, the required rules are more complex. The result also varies in transparency: most learners seem to find the *t:d* or *p:v* alternation easier than the *k:∅* or *lt:ll* or *mp:mm* alternation. F. Karlsson (1982b, 330–331) actually states that all words subject to qualitative gradation are marked, which makes combining the main rule for these words. Whether this is the case either with native speakers or learners requires further research.

The value of rules depends on the number of exceptions. In areas where a large number of items must be marked as exceptions or where many subrules are required, other types of description are likely to triumph. Another problem for rule descriptions is that rules are unidirectional. The basic form is needed for application. Outside formal teaching situations learners are not provided with basic forms, but with miscellaneous input. To benefit from this input learners need two-directional rules. Some textbooks and many teachers give hints for finding basic forms, but generally this area has been neglected,

[63]That partitive plural formation is cognitively complex is evidenced by the fact that the average number of different partitive plural forms for nonce words produced by the Finnish control group is four. Matthews's claim that "the Plural is merely a mechanical consequence of the Singular" (1974, 42) is hardly justified in Finnish.

although the strategies for the utilization of spontaneous input are essential for second language acquisition.

As rule-presentations and paradigm-presentations are two competing models of morphology, it is natural that the advantages and disadvantages of paradigm-based models mirror those presented above for rules: the areas where rules run into difficulties tend to be the ones where paradigmatic explanations excel, and vice versa. Thus many aspects of the fit between the data and the paradigmatic models of Finnish morphology can be inferred from what is said above, while some features of the models themselves are discussed below.

Just as combining was seen to be the primary rule, analogy can be regarded as the central mechanism of paradigm models: paradigms are formed on an analogical basis. Learning involves predicting new forms "by analogy with one specimen or another" (Matthews 1974, 68). In rule-based models the problem for the learner is the limits of combining, while in paradigm models it is the limits of analogy.

Many problems of rule-grammars, such as those related to the order, hierarchy, or direction of the rules, do not appear in paradigmatic models. Neither are exceptions a problem where no rules exist. The difficulties lie elsewhere. In Finnish, the concept of word-type is crucial and problematic. The problems surface in practical applications: How many nominal types should one establish? When does the number of types become a burden instead of an aid? But these questions are based on theoretical problems: What constitutes a word-type? Are there any a priori criteria for the number of types?

The question of the limits of analogy is related to the question of word-types. The classification of words into types is based on the similarity of their paradigms. In the paradigmatic models of Finnish, the word-type division is based on the similarity of the end of the stem.[64] The other similarities are of no consequence. The changes affecting the middle of the word are treated under consonant gradation, not integrated into the word-type list. Consonant gradation is either presented as rule-based or else as a separate list of types (as in SKP). Both methods separate it from the word-type listing, as if the gradation and other stem changes did not affect the same words. For learners, this is particularly crucial with the *i/e*-words and basic forms ending in a consonant.

The separation of consonant gradation and other stem alternations is a problem for the unity of the model. By this criterion rule-based models win: they handle everything within one framework, and the learners need to learn only one kind of processing. There are good reasons for this separation, however: if all combinations of consonant gradation and other stem changes were to be word-types, the number of types would approach the number of words, eroding the strength of the model as a predictor of word-forms. A model with a complete listing of all word-forms explains everything and nothing: all forms can be found, but nothing is said about their relationships.

The problem of the inclusion of consonant gradation aside, paradigmatic models aptly account for some features of learner behaviour. A feature of these

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[64]For an exception, see 3.2.3 for the plural formation of two-syllable nominals ending in *a*.

models is that morphemes are seen as properties of each word as a whole, not as things to be tagged onto stems, one after another. Many plural forms produced by learners, both spontaneously and in the test, are difficult to explain as products of rules, while an analogical process can be postulated: the word is learnt as a whole. The first part of it is assigned to carry the meaning, the latter part (e.g. the partitive plural formative) the grammatical function, with the border between the parts more or less fuzzy, depending on the structure of the word. This latter part, called the formative in this study, is borrowed as such when a new word needs to be used in the same function. At first there are no constraints as to which stems and which formatives are combined, and the result is acceptable only by accident. With further input the similarities between the stems start to emerge as schemas for the choice of the formative.

The reasoning above is by no means new. After all, restructuring is the commonly given explanation for many diachronic developments, for instance some Finnish case endings. Also the reasons for its exploitation are the same: rule-based explanations run into difficulties in this area.

Besides restructuring, the concept of paradigmatic cohesion is used in the explanation of the data. There is evidence both for and against intraparadigmatic cohesion in the data. The evidence from learners, however, brings up the problem that even if language acquisition is visualized as paradigm building, paradigms remain incomplete for a long time. A paradigm with many gaps in it is likely to be less cohesive than a complete one.

The Finnish control group produced some interesting evidence for intraparadigmatic cohesion. Longer nonce words, which are easy to recognize as members of productive word-types, due to derivational markers, turn out to be quite cohesive (e.g. the genitive singular and partitive plural are of the same paradigm), while short words with consonant gradation and particularly words ending in an *-i* and *-s* show considerable lack of cohesion, i.e. the two forms written next to each other are not of the same paradigm. As the behaviour of the Finns is not the issue here, this question is not explored further, but it serves to show that intraparadigmatic cohesion is not self-evident.

Numerous examples of interparadigmatic influences are found in the data. Both the learners[65] and the control group display the tendency to confuse paradigms, both on formal and semantic cues. Paradigms are clearly not totally independent of each other, but must be described as chain categories, where members of paradigm A share certain features with members of B and another set of features with members of C, while the members of B and C do not necessarily share any features, other than what is common to all nominal paradigms.

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[65]The learners' sense of connections between paradigms can develop to, or even above, the level of native speakers. During a museum visit a group of advanced students learned the word *ies* 'yoke'. As a clue for the paradigm I also gave them the genitive *ikeen*, with the result that for the rest of the course I heard joking sentences like "Joko *mikeet* on tulleet saunasta?" (Pro *miehet* 'men', 'Have the men come from the sauna yet?')

Interparadigmatic influences lead back to the question of the number of word-types. What is the relation between the number of types and the probability of interparadigmatic influence? Could avoidance of confusion be a criterion in the decision on the number of types?

If the number of categories is increased, the internal similarity between the members also increases, as deviant members are housed in new categories. Thus the category-internal cohesion grows. At the same time, the number of items in each category decreases, with the result that the input re-enforcement for the category decreases. Thus categories become more cohesive and less thoroughly established. This may not matter when input is readily available for a long time, and even rare categories become well-rehearsed, but it is important for learners. Without extensive experimentation it is not possible to determine the effects of the number of categories on interparadigmatic confusion in learner language.

Nor does it seem possible to set other a priori criteria for the number of word-types if the psychological reality of a model is considered at all. Finding the right balance seems to be the basic dilemma in the description of Finnish morphology: if you reduce the number of word-types, you will have to increase the number of rules or constraints, and vice versa. Thus the purpose of the model building must be to define the number of categories. In this light, the language-external limit on the number of word-types, which Carstairs suggests (see Section 3.1), resembles the attempts of early grammarians who tried to force Finnish morphology into the categories of Latin.

Neither rule-based nor paradigm-based models of morphology seem to achieve perfection in explaining learners' inflectional problems. I started by declaring my eclectic position and continued by explaining data with reference to several models of morphological thinking. If I conclude that several models are needed for explanation, does this constitute circular reasoning?

There is always a certain amount of intuition involved in research into language, unless one studies a language totally unknown to oneself. Eclecticism does not, however, mean random application of models on data; it means that several explanations are tried for each phenomenon and the best one is selected. What the best one is in each case is determined by the general criteria of scientific modelling such as simplicity, economy and explanatory power. Still, reliability is difficult to achieve, as what is simple and plausible to one person may not be so for another, since the cognitive structure and experiences of a person inevitably affect such decisions.

Since the simple and plausible explanation of data requires features from more than one model, an alternative to eclecticism is to introduce a new angle by asking: Are the two models under comparison really distinct from each other? Is there a profound difference between a rule and a word-type or are we using two names for one concept?

In a sense, word-types are a way of determining the constraints for a set of rules. Rules can also be seen as descriptions of intraparadigmatic forces, and interparadigmatic influences as overgeneralizations of these rules. It is simpler or more plausible to explain some parts of the data within one framework than the other, but correct products can be explained by both models, albeit

sometimes with complex sets of rules or a long list of conditions for the membership of a word-type. Similarly, errors can be seen as misapplications of rules or as mishaps in paradigmatic processing. Thus, conclusions can only be drawn as to the probability of each type of processing and from there to the match between processing and grammatical models. Furthermore, regardless of whether rules or word-types are employed, a number of words remain beyond their scope. No matter what the model, lexical processing (see 8.3) plays a role.

The interrelatedness of rules, paradigms, and lexical processing in morphology is implicitly present in most descriptions of Finnish. This may partly result from the tradition of not explicitly spelling out the theoretical background, thus creating no need to operate within only one set of assumptions, but it is more likely to reflect the nature of Finnish, which seems to defy monolithic views about the workings of language.

Grammatical models which explicitly avoid the problems presented above, such as Bybee's approach to morphology (see 3.1), await application to Finnish. Her concept of schema is useful for explaining some parts of the data (see e.g. 7.2.2). The way the Finnish control group attaches any sequence signalling the partitive plural onto nonce words could also be described as schematic behaviour. Only one feature of their behaviour — the observance of vowel harmony — is clearly describable within a rule-based framework. Lexical learning must be excluded, as the material is nonce words, and paradigmatic forces do not always hold either (see 5.6).

On the basis of this data, it is not possible to draw any exhaustive or definitive conclusions on the relative values of the two main models of morphology, nor to determine if two separate models really exist. Nevertheless, it has become clear that some types of explanations fit certain parts of the data better than others. The implications of this are the topic of the last chapter. Before that, however, the cognitive processes underlying production will be discussed.

8.3 Modelling learner production

Two models of morphology as a source of explanations for learner data were the topic of the previous chapter. In this chapter the products of learners are discussed from the viewpoint of morphological production along the lines presented in Chapter 2. As linguistic models are seldom totally independent of human cognition, the two topics are intimately related.

The product is not the process: at best it only obliquely reflects the process. The correct forms of learners are opaque as to processing, as they can result from any type of morphological process, while errors may contain hints for or against a given process. Thus, evidence for this chapter is partly based on the errors in the data, partly on the interview material, the reliability of which as evidence of inflectional processes is discussed in 6.3.

Many concepts introduced in Chapter 2 — categorization, memory storage, error, and transfer — involve the question of analogical processing. It is also the basis of paradigmatic thinking. Thus its relation to rules resembles the relation between rules and word-types (8.2): rules can be seen as expressions of analogy, or analogy as execution of rules. They can also be regarded as a continuum: rules for predictable behaviour, analogy for exceptional behaviour, with a gradual transition from one to the other (see 2.4, where the definitions of analogy are also discussed).

Defining the limits of analogy is a basic problem for its use in morphology. One aspect of this was discussed under the terms of the *quality of morphophonological alternations* and *saliency* in 8.1. Another aspect is the source of models, since they can be sought in the same paradigm, in paradigms of the same word-type, in neighbouring types, or in phonetically, semantically or functionally similar paradigms. Limitations on sources of models improve the success rate, i.e. the number of correct results. At the same time, such limitations inhibit production, as suitable candidates for model words may not be easily found within the given sources.

As analogy is a creative force present in cognitive processing in general, not only in language, and the theoretical difficulties in limiting it have driven scholars to models which attempt to exclude analogy. But for the practical task of language acquisition, analogy is undoubtedly a resource. A learner with diverse analogical processes is more likely to produce language from the early stages of acquisition than one who depends on the control of a rule system. Ample production elicits more feedback from interlocutors, reinforcing correct analogies and discouraging erroneous ones, and thus facilitating learning.

Besides the limits of analogy, the nature of analogical reasoning (of native speakers) is problematic (see 2.4). One of the questions is whether analogy is based on concrete model words or on abstract patterns. The interviews with learners show that, at least at some stages of learning, concrete patterns are used. This is also displayed in the test data, not unexpectedly, as the test was set up to provide models for proportional analogy. In the spontaneous data no explicit examples can be found, as the production process is not usually apparent. However, as the use of model words is promoted by teachers and textbooks, it is not possible to determine whether this is the case more generally. Nevertheless, T. Itkonen's (1976) conclusion that inflectional production is a continuum from memorization via concrete models to abstract patterns is also quite plausible in the light of learner data. The view of linguistic processing as a continuum has also given rise to connectionist models of language.

Analogy also underlies categorization. Classification of input is of utmost importance in interlanguage, and problems in this area are clearly reflected in the data (see 8.1). It is not necessary here to know whether the urge to classify is a basic cognitive feature of all humans or a habit created by schooling; in either case it is present in adult learners. Thus the ideal presentation of linguistic material should fit the existing categories of the learner, or where not possible, the principles of new categories should be made explicit.

If the eventual goal of learning is defined as a reception and production system of Finnish, identical to the one with which native speakers operate, we need much more information on the categories of the linguistic knowledge of Finns to teach effectively. The categories of grammatical descriptions are not, nor are they intended to be, cognitive categories. This difference can be illustrated by an example: after her Finnish lesson on derivation, a learner asked her hairdresser for nouns which could be derived from the verb *pestä* 'to wash'. Astonished silence was followed by the suggestion: "*Shampoo*".[66]

It has been suggested that semantically close forms are also phonologically more similar than other forms (Bybee 1988, 129–130). It is easy to find both evidence and counterevidence for this in Finnish morphology,[67] but proving this right or wrong on the whole is not easy, since it involves the same questions of measuring similarity as have been brought up in 8.1. Nevertheless, any associations which can be established between forms and functions tend to help learners, and are thus worth the search.

The conclusion in 8.1 was that the acquisition of morphology requires a three-dimensional model. But as morphology is not separate from sounds, meanings, and utterances, morphological categories presented for learners need to have connections with these areas as well. It is obvious that such a model, because of its sheer size, cannot be complete, but to develop even partial models for the core morphology along these lines is an important task for further research.

An attempt to develop such partial models for phenomena of different languages is in progress among scholars who subscribe to connectionist ideas. The problematic areas for learners are those where the one-form-one-function principle is broken. As the connectionist approach involves multiple connections between meanings and forms and among forms, these areas can be dealt with together with the areas of regularity (see 2.4). Also, the arguments for rule-based or paradigm-based models become superfluous, since neither is needed in these models.

Although connectionism in its currect form is a product of the 1980s, a very similar idea was presented earlier in Finland by Paunonen when he discussed the variation of *-ti* and *-si* in the past tense of certain Finnish verbs: "It is quite evident that included in a speaker's intuitions about the use of his native language are a number of extremely fine distinctions determining the different values associated with different forms. How should this type of distinction be included in a grammatical description? Structuralist methods are of no use, neither does generative grammar seem to be able to provide a solution. It might be possible to speculate that in the lexical entry for each verb there is a specification '*-si* is X-possible'. This solution might seem quite uneconomical, nor does it in the form presented above give any information

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[66]My thanks are due to Tuula Pirinen for this example.

[67]For example, the local case endings generally bear similarity to each other, both in meaning and in form, but, within the same area, the illative and allative endings are quite different, albeit similar in meaning.

about the extremely delicate tendencies and mental associations which conceivably have a bearing on the type of variation discussed above." (Paunonen 1973, 293–294.) What connectionist modelling adds is the concrete and quantitative expression of these delicate tendencies and associations.

Since learning, according to connectionist models, consists of establishing and changing connections, all data in this study can be explained within this framework. Correct products result from strong connections, errors from weak connections. Semantically induced errors, such *keittoa* pro *keittoja* ('soups'), which cannot be explained within the strict limits of formal morphology, are evidence of connections between meaning and form. The ability to inflect nonce words — which cannot be included in the existing system of connections — is evidence for the learning power of the system.

The fact that learners produce unnecessary stem changes, or that they produce changes which as such exist, but belong to another word-type or inflectional category, can also be seen as evidence in favour of the connectionist models: certain phonemic or graphemic properties of the stimulus (like the basic form in the test situation) activate connections related to stem changes. In addition, there might be semantic connections to words with similar meanings, paradigmatic connections to other forms of the same word if some of them are memorized, and/or lexical connections with words similar in some more or less random way.

How could the acquisition of Finnish nominal inflection be described within this framework? A word, say, *käsi* 'hand', would be learnt by establishing a new connection between the word and the referent, possibly also with the corresponding words in L1 and other languages. With additional input, connections would also form between other words in the context (e.g. *pane lapaset käteen* 'pull on (hand) the mittens'; *käsi ja jalka* 'hand and foot'; *käsin tehty* 'hand-made', etc.). Connections between the forms of the word would be partly with these collocations, partly with other similar words (*käsi* : *kädessä* = *vesi* : *vedessä*). What kinds of connection would be reinforced depends to a larger extent on the learning context — the latter type would be strengthened by focusing on form, as happens in the classroom. So teaching could be defined as providing connections, helping out the weak ones by focusing and repetition.

The factors influencing learning, listed in 8.1, can also be integrated in these models. Morphophonological complexity, lack of saliency, or problems of category assigment reduce the likelihood of making a reusable connection, whereas frequency, familiarity and proximity strengthen it. In fact, such time-honoured methods of language learning as memorization and repetition receive support from the connectionist models.

The above view of connectionism makes it look like Westermarck's lockpick (see p. 194). The problem with these models is that they can neither be proved nor disproved as such, only piecemeal (see p. 44). So far there is some evidence that, where applications have been made, connectionist networks built into computers produce reasonably human-like results in the learning of small areas (such as irregular verbs of English, German declension, or a small area of Finnish nominal inflection; for references see 2.4). Such models are intuitively intriguing, but the fact that they work in computers is not firm evidence for

them as cognitive models. But neither is it evidence against them as models of human behaviour.

Among the traditional alternatives for the explanation of morphological data, paradigms can easily be posited as expressions of connections. But particularly in the light of error data, rules could also have a connectionist interpretation. In a rule-based approach, errors result from misapplications or non-applications of rules, or of applications of wrong rules. But how do these take place? Some kind of connection within either the data or the rules must be postulated to make such mishaps possible.

Another much discussed model at the moment is the Competition Model of MacWhinney and Bates (see 2.4). It explicitly sets out to bridge the gap between functions and forms, and does not require one-to-one relations between them. As an example, this model can be employed to explain the problems which learners encounter with nominals of the *liike*-type ('store; movement'). They look like prototypical Finnish nouns: two syllables, ending in a vowel, like *liima* 'glue'. For consonant gradation, there are several possibilities: the *liika* : *liian* pattern ('excess'), the *psyyke* : *psyyken* pattern ('psyche') and the *virke* : *virkkeen* pattern ('sentence'). As the glosses indicate, the word has also more than one semantic function.

In production, the above possibilities compete. The syllable structure provides one cue, the *k* in the stem another, and so does the final *-e*. The synonym *kauppa* ('store') may also act as a source for a cue. The winner is determined by the strength and validity that the available cues have for each individual, but the result is also influenced by a cost factor, which is the sum of perceivability and assignability (Bates & MacWhinney 1987, 179).

As the Competition Model has not been experimentally applied to Finnish, there is little evidence in favour of its suitability. Like the connectionist models, it continues to evolve, and developers of these models also work together. Finnish morphology could offer interesting challenges for this work, and some results of this study might serve as a basis for establishing the factors which need to be quantified for such applications.

The arena for the battle between the models is paved with the problematic forms. Any model can handle what is regular and easy to learn. The advantage of connectionist thinking and the Competition Model over rule-based thinking is that only one kind of process need be assumed. The rule-based models must assume both rule-production and lexical production. But once built, the system functions well in computers, as can be seen by the applications which are capable of producing the inflectional forms of Finnish words. Connectionist models are still a long way from this situation, although they are able to learn and produce more limited morphological sets.

While multiple connections have provided the name for the connectionist models, lexical processing, at the other end of the continuum, could be called separatist: an extreme lexicalist model assumes that all word-forms are memorized. The advantage of this is that it alleviates the one-form-one-function problem. As each form is a non-divisible unit and has a separate representation, it can be individually attached to a separate function, although synonyms and homonyms occassionally break the system down.

An extreme lexicalist claim has never been made for Finnish. On the contrary, most models of Finnish morphology consider lexical processing as the last resort. Nevertheless, some features of the data of this study can also be interpreted as evidence for its acceptance or rejection.

The fact that, at least by some criteria, real words in the inflection test are more often successfully produced than nonce words is evidence for the lexicalization of inflection. A particularly clear case is the pair *poika — toika* (see 5.1). Similarly, many complex correct forms in the spontaneous data could be assumed to be lexically produced, if the same utterance contains errors in simple word-forms. On the other hand, all acceptable forms of nonce or unfamiliar words constitute evidence against the lexical claim. Thus, it is safe to state that some word-forms are produced from memory, but definitely not all.

Memory is central in the production process. "Good memory" is often cited as essential for language learning, and this lay view is frequently displayed by the interviewees in this study. The issue of lexicalization is intimately related to the workings of memory (see 2.2). Lexical production assumes storage as whole units, while other productive processes can function on decomposed presentations, such as stems or basic forms and lists of morphemes, allomorphs, or formatives.

The SAID model (Niemi et al. 1994; see p. 21) predicts for Finnish that both inflected and productive derived forms have decomposed representations in the output lexicon. It is not clear whether the model allows for whole-word representation at all. In an earlier work, Niemi et al. (1991, 129) refer to the possiblity of context-sensitivity, stating that "the subject is able to apply different parsing strategies depending upon the context of the task". This conclusion is based on the *kiukaassa*-type (< *kiuas* 'sauna stove'), one of the most problematic word-types for learners. As an underlying reason for the choice of an exceptional strategy, Niemi et al. refer to criterion shift, which resembles the concept of competition put forward by MacWhinney and Bates.

The SAID model results from studies with native speakers of Finnish. If the morphological production mechanism is believed to be universal, the same mechanism should be used by learners as well as by native speakers. The universality claim can be made both for single-mechanism and multiple-mechanism models, while language-specificity is more compatible with multiple-mechanism models. A language-specific single-mechanism theory would lead into unnecessary complications in SLA. If, say, in German all word-forms were memorized, and in Finnish produced from decomposed allomorphs, the German learner of Finnish would either have to acquire a totally new set of tools for the reception and production of Finnish, or to memorize every form, with the result that even if his/her production sounded or looked native like, the underlying process would remain totally different indefinitely. I know of no evidence which would establish that this is what happens, although Hankamer (1992, 405) presents it as a possibility.

The universality claim for a single-mechanism model would state that if all word-forms are produced ready-made from memory in English, all of them would also be memorized in Finnish. Similarly, if allomorphs are combined for production in Finnish, all English words would also be produced in that

fashion. This is feasible, but since the extent of the morphological machinery of the two languages is quite different, it would not be economical. Why waste memory functions for word-forms that can be produced by a simple mechanism, or why keep track of complex hierarchical rules which can only be applied to a handful of stems?

A multiple-mechanism model can be universal in two ways. The strict claim is that all processing mechanisms are available to speakers of all languages and used to the same extent. The moderate claim is that all processing mechanisms are available to speakers of all languages, but the distribution of their use is language-specific. It is the latter version which best explains learner data. Learners can produce word-forms from memory and they can produce them from segments, but the errors they make show that production from segments is not always successful. Many reasons for this are presented above, but difficulties with the production process, which is typical of Finnish, may well underlie many errors. These errors are L1-related in the sense that speakers of languages which widely employ the same processes as Finnish are likely to be able to use these mechanisms more proficiently in Finnish as well. Language learning would thus involve a shift in the distribution of the processing mechanisms. However, since production is not all process but also substance, experiments directed towards separating the effects of processes and the effects of substance are needed to establish the influence of L1.

A model with ready-made word-forms, selected for consumption from storage, would make it unnecessary for us to concider the effects of the linear nature of oral production on morphological processing. However, since the lexicalist claim has been rejected above, the problem has to be addressed. Learners themselves sometimes point out that to apply consonant gradation and other stem changes it is necessary to know in advance what suffix(es) will be needed. In other words, the trigger of the change only comes after the change may have to be produced. The problem is by no means unique to Finnish,[68] but apparently it hampers the production by learners to some extent.

Processing by analogical comparison would produce word-forms as whole units, thus circumventing this problem. An allomorph storage model, such as SAID, where the alternations are present in the stored units, also precludes it. The problem appears if word-forms are assumed to be produced from basic forms by rules, simultaneously with speaking. Postulating a monitor between the cognitive processing by rules and the neuro-muscular activity of speaking would take care of the problem in the sense that it would not show in the products of proficient speakers. In the early stages of learning such a monitor might not work well enough, thus accounting for stem errors. Even later there would be traffic back and forth between cognitive processing and the monitor, slowing down production, as unsuccessful products of rule-application would

[68]An interesting example is from Ojibway, a Canadian native language, where the manifestation of fillers in speech is dependent on the initial sounds of the word to follow. Thus the speaker needs to know what is coming next, even while hesitating. (Patricia Ningewance, personal communication.)

be sent back for repairs. Both errors and slow production could be what the learners mean when they mention this problem.

Is the fact that learners perceive this problem evidence for rule-production with abstract morpheme representations? Not necessarily. It may simply derive from the fact that stem changes are taught as rule-governed. It is also feasible that rule-production fits L1 well and the question of morpheme representation is not important because stem changes are rare. The application of a production mechanism typical of the L1 would then cause the problem.

Confusion between words with similar beginnings are another common learner problem. There is little evidence of it in the intermediate-level data of this study, but it is quite common in the early stages of learning, when words like *vanha* 'old' and *vähän* 'little' or *aika* 'time' and *aita* 'fence' are confused. The nature of these problems is partly phonetic: they stem from difficulties in distinguishing sounds. However, one cannot exclude the possibility that these errors constitute evidence for the Cohort Model (see 2.2): words are listed by their beginnings. The fact that these errors soon decrease could result from strengthened connections between forms and meanings, as well as from the acquisition of morphological devices for keeping, for example, nouns and verbs apart.

Also the results of a small experiment I once conducted at the end of a four-week intensive course for beginners point to the Cohort Model interpretation of storage. In the test the students were requested to connect the forms of the same word with a line. However, words were more often connected with other words with similar beginnings. This result cannot be considered conclusive, since the amount of words and informants was small. Further experiments with learners at different levels of language skills are necessary.

The role of teaching has been brought up several times as an explanation. Teaching naturally provides learners with some skills that help them to verbalize their knowledge about language, but it is not necessary for the acquisition of both the procedural and declarative knowledge of language. Adult learners possess both forms of knowledge regardless of their SLA background (see 2.3 and 6.1). The division of labour between the two is difficult to establish, however. In the framework of this study individual differences are ignored, but is there any indication of some parts of morphology being easier to learn via the declarative route, some through the procedural one? No direct evidence is available, as the collection of data was not planned for this purpose. The learner interviews, which could have been used for this purpose, concentrate on the declarative knowledge of certain inflectional strategies, not on the acquisition of nominal inflection as a whole. But on the basis of the overall results, the interrelationship of the complexity of a morphological category and the type of knowledge formation could be explored in a later study. It could be hypothesized that declarative knowledge is easier to form in relatively uniform areas, such as quantitative consonant gradation, while areas with variety and conflicting patterns might be better left for procedural knowledge formation.

Many models of language learning (see 2.3) assume that declarative knowledge is proceduralized with practice. The proceduralization of linguistic knowledge is in agreement with the connectionist view of learning. As long as connections are weak and insecure (in the sense that different alternatives compete on an equal basis, since none of them have become sufficiently stronger than others to win out immediately), declarative knowledge could act as a support, directing the search for the strongest alternative or determining the result of a competition. But as connections between the input form and the required output form grow in strength, the need for this intervention grows less.

Finally, the question of transfer in morphology (see 2.5) must be revisited. The evidence of L1 influence in itself is not very interesting, as "contrastive analysis is not a language learning theory" (Wode 1982, 21). Furthermore, evidence of direct transfer is hard to find in Finnish morphology. Some examples of functional transfer of the kind outlined in 2.5 can be found (e.g. examples (10) and (12) in 7.2.3). Also non-inflection can be seen as evidence of transfer: if the object is not case-marked in L1, this practice may be carried over to L2. Another example is the non-inflection of adjectival modifiers.

Another type of transfer is suggested in this chapter, in connection with morphological production processes. If, for instance, further evidence is found for the SAID model, to support allomorphic representation in Finnish, while some other type of representation is found to prevail in the L1 of a learner of Finnish, transfer could occur an the processing level. Thus, the concept of process transfer could be established, alongside the traditional structural transfer and the functional transfer presented above.

It has been found in this study that numerous factors influence nominal inflection by learners of Finnish. The accumulation of these factors in certain areas of inflection makes these areas more error-prone than others. The identification of these areas is not an achievement, as experienced learners and teachers alike could have listed them in advance. Difficult words are difficult to learn. The contribution that this study attempts to make is to link the influencing factors with morphological models and cognitive processes in a search for possible explanations. The suggested reasons behind the difficulties are only a starting point, both for many new studies but also for experimental teaching. As the learners of Finnish are the real heroes of this study, in spite of having to remain in the background, the final chapter is devoted to them. How could the teaching of morphology be improved?

9 IMPLICATIONS FOR TEACHING

Motto:
Kaikki se on mitä muistaa
ja mitä ossaa.[69]

In the previous chapter, Finnish morphology was described as a relief map, moulded by many factors. The factors are intertwined in multiple ways, thus making it impossible to approach the task of learning Finnish from a single perspective. In an SLA situation, it does not make sense, for instance, to organize the vocabulary to be learned by any one principle, such as morphological complexity, frequency, or problem potential. Other factors inevitably interfere in the learning process, making the maintenance of the organizing principle more of a burden than a help.

Morphological models based on one processing strategy alone were also rejected as sole sources for the explanation of learner behaviour. For some kinds of data more economical descriptions could be found from one model, while other kinds were better explained by another model. Many examples could be explained by more than one model. The discreteness of the models themselves was also questioned, and the cognitive principles underlying processing were examined. A processing model which allows word-forms to be produced in more than one way found support. Many directions for further research were suggested, in order to confirm or refute some tentative results of this study.

This vague and indeterminate result is by no means new. Although many scholars have built unitary models, more pleasing to the orderly mind, those working with authentic perfomance data have had to admit that real language defies monolithic approaches. In Finland this has been emphasized by Paunonen, who describes morphology as a dynamic field where the relations of

[69]'One has everything that one remembers and knows.' (From a learner in 6.2).

elements are regulated by forces of different strengths and directions (1976). For processing models a similarly eclectic view has been presented by Hankamer (1992, 405), whose conclusion "leaves open the possibility that the correct model for all languages is a mixed model in which some morphologically complex forms are listed while others are understood via parsing".

It is precisely this quality of morphology that makes learning Finnish problematic for many students. The system described in grammars and textbooks is very static and regular, with all forces described as equally strong, while in real life it is quite variable and flexible. Native speakers can handle this, as they do not rely on a rigid grammatical description, but operate by reference to the dynamic field, where certain forces or connections are strengthened more than others by frequent use and memorization.

Linguistic models and teaching models

It can be argued, of course, that a linguistic model of a phenomenon does not need to bear any resemblance to the model intended to promote language acquisition. For instance Matthews (1974, 71–72), for all his eclecticism, states that for the linguist, only explicit rules are of real interest, while working out the balance between the teaching techniques is a matter of practical decision, the job of the language teacher. It is difficult, however, to find arguments to defend such a position, other than the desire of theoretical linguists to avoid dirtying their hands with practical problems. Why should we strictly separate models for linguists and models underlying teaching? If a model is so unrealistic as to be of no value to the learner, what is it actually a model of? The answer could be: the competence of an adult speaker of the standard variety. But can it be claimed that this abstract competence of an ideal speaker actually exist, if the model for its description is out of bounds for testing against less than perfect data? Furthermore, if the ultimate aim of SLA is a native-like command of the L2, how could this be achieved if important aspects of the models for learners and the models of the native competence have little or no resemblance?

Another aspect of combining theory with teaching is the question of the unity of a model. Would it not be easier for learners to internalize the operating principle of a uniform model than to learn to apply several operating principles for different parts of a language? The answer depends on one's view of human cognition. If all language production is assumed to rely on only one processing mechanism, then the operating principle of the grammatical description and the processing mechanism should be in agreement. If the unity of the model is held as the prime criterion, it is important for the teacher to be explicitly aware of both the theoretical principle of the linguistic model which s/he chooses and the assumptions it inherently carries about cognitive mechanisms. A mismatch between the description and the processes that the students are assumed to have can be quite confusing. On a practical level, this sometimes happens when the textbook promotes a functional or holistic view of language and the teacher's view is strictly rule-based, or vice versa.

In this study, the conclusion is, on the one hand, that it is those morphological models where several operating principles underlie the

description which provides the truest image of Finnish nominal inflection. And, on the other hand, it was also found that morphological production employs different processes for different purposes. These two views are not incompatible.

As a multitude of factors and processes of varying strength are working side by side in language production, a simple recipe for the effective teaching of Finnish morphology cannot be given. What can be done is to match the various areas of description with the promotion of the cognitive processes best suited for them. Moreover, as some views of language processing are rejected, it is possible to seek teaching practices which may be counterproductive. A more extensive formulation of a learner-friendly model of the Finnish nominal declension must be left for another occasion.

Categories

Basically the scholar and the teacher face the same questions: all facets of inflection cannot be treated at once. How much data can one include and still keep the model elegant and economical for the scholar, or presentable and learnable for the teacher and the learner? How much can be swept under the carpet, without meandering too far from the true nature of the language? The criteria for decision-making are different: the scholar must adhere to the universal and language-internal evidence; the teacher must consider the resources and needs of learners.

The primary motive of most learners is the need to communicate: they need forms to express functions. The relationship of inflectional forms and the learner's communicative intentions is by no means simple. On the one hand, if all possible forms for expressing a certain function, or all functions of a given form, are presented at once, the learner's information-processing capacity may be too severely taxed. On the other hand, if only a prototypical way of expressing a function or a prototypical use of a form is presented, the learner easily assumes it to be the only one. Later this notion will have to be unlearned to allow additional form-function relationships to be acquired.

It is often the prototypical use that has given a category its name. A good example would be the local cases, which have both concrete and abstract functions. Some of them can be regarded as metaphorical extensions of the local meanings, while others are purely conventional. Their name refers to concrete functions alone, resulting in a misconception of the meaning and functions of the grammatical formatives.[70] Basically, this is a problem of categorization.

The learners' subconscious notions of categories as strictly separate or as overlapping and fuzzy are probably both culture-dependent and idiosyncratic. The prototype effect described above is likely to influence learners with strict category: once they have learned that *-lle* means 'onto' and *-ltA* equals 'from', they protest when they find out that Finns say *kakku maistuu hyvälle* 'the cake tastes good' and that one can just as well say *kakku maistuu hyvältä*. The implicit

[70]At a more theoretical level this has been discussed in Määttä 1994, 158–159.

way of getting around the one-form-one-function obsession is to systematically present several functions for each form and vice versa. That different types of categories exist can also be expressed in teaching, both verbally and visually[71]. In groups with a common language it is also possible to explicitly discuss learners' images of categories and their effects on language acquisition, thus enhancing the students' knowledge of themselves as language learners.

Rules, paradigms, connections

In the light of the results of this study, what should the role of rules be in the teaching of the nominal inflection? Rules express regular behaviour, and the best rules have few constraints. The basic rule of combining is a good example, since exceptions are very few (see p. 195). It not only aids production but is essential for the analysis of input, if anything but a completely lexical representation of word-forms is assumed.

Reasonably regular phenomena, such as quantitative consonant gradation or the stem changes present in the *-nen*-words, can well be described in rule form. As the number of constraints grows, however, the rule presentation and the model-word-cum-analogy presentation start to compete, or fuse. This is because to make a complex rule digestible, one has to involve examples in its presentation, thus inadvertently triggering analogical mechanisms. On the other hand, to focus the learners' attention on the similarities and differences of paradigm patterns, one usually verbalizes some kind of a rule, a rule being an abstraction from patterns. Thus the argument between rule-based and paradigm-based models of language becomes a mote point in actual teaching. One can only deduce by the emphasis, the vocabulary used in explanations and the types of exercises, whether the learner is invited to build rule-based or paradigm-based production strategies.

In addition to inherent complexity, due to complicated constraints or many hierarchical levels within the rule system, a large number of exceptions can also lead a rule-based approach into problems. A strong rule can take a handful of exceptions to be memorized, but not too many. A good example is qualitative consonant gradation. It is no more difficult to describe by rules than quantitative gradation, but there are many unpredictable exceptions. A variable rule of the type used in sociolinguistics stating that gradation is present in, say, 85% of the instances only helps the learner by providing a statistically better chance of correct guesses. It is no help with individual words.

A rule approach to qualitative gradation, as in any area with many exceptions, creates the need to zig-zag: first a rule is learnt, then it is cancelled for certain words. Another starting point is to consider all words with qualitative consonant gradation as marked, as suggested by F. Karlsson (1982b, 330–331). Thus combining would be the main rule, while consonant gradation

[71]Most textbooks employ modifiers, such as usually, seldom, etc. Another way to express the same situation is the concept of 100% rules that Vähämäki uses in his book (1994, 152), apparently implying that other rules are less dependable. A common type of visualization is to group words so that some fall between the groups which present the prototypical cases.

would be learned for each word separately. This is in accordance with the prediction for allomorphic representations of the SAID model as well. It is not altogether clear, however, whether the same approach should be extended to quantitative gradation. The findings on which the SAID model is based are not very extensive, and even if native speakers turned out to have allomorphic representations of all stems, the rules for the most regular types of gradation may speed the acquisition of the system by adult learners.

Learners are bound to produce errors in the course of acquisition. One determinant in making decisions about a teaching approach is the reception of erroneous forms by interlocutors. Are Finns more bothered by non-gradation or over-gradation, i.e. is **tukin* (< *tuki*, pro *tuen* 'support') a more or less grievous error than **muin* (< *muki*, pro *mukin* 'mug')? If non-gradation is seen as a less serious error in natural contexts, consonant gradation can be left to be learnt with individual words, whereas if over-gradation goes unnoticed more easily, a rule-approach is likely to help more on the way to effective communication. Unfortunately, at the moment no research results are available to support this kind of pedagogic decision making.

Even if the first Finnish grammars were written for learners, they and the morphological presentations of current textbooks are separated by a long tradition of grammars for native speakers. When looking up a grammatical rule, the native speaker is searching for an explanation for a form which s/he already knows, the learner for a tool to produce a previously unknown form. Thus the order of application of rules is not necessarily important for the native speaker, while the learner has no way of knowing which order results in a correct form. The same is true of other features of rules, discussed in earlier chapters, such as the direction of rule application or the choice of the basic form. The native speaker, who knows the paradigm, can apply rules starting from the basic form, while if the learner is to rely on rules, s/he also needs implements for isolating word-forms from speech, and rules which lead from inflected forms to the basic form. This is an area which is often neglected when rules are carried over from linguists' grammars to textbooks for learners, although experienced teachers are aware of these needs and have included some helpful hints in their textbooks.

A crucial problem for the acquisition of stem changes is that they do not seem to carry any function, as if they only existed to torture learners. They may even seem harmful, as they reduce paradigmatic cohesion and increase interparadigmatic confusion (cf. *tukki* : *tukin* 'log' and *tuki* : *tuen* 'support' vs. *tukki* : **tukkin* and *tuki* : **tukin*). In production, it may be difficult to find a function for stem alternations, but in reception they quite likely play a role. They help predict the function of the word in the sentence even before the suffix is heard, or even if the suffix is not uttered at all, as is often the case with the genitive *-n*, for example. This extra clue is not indispensable because not all words contain stem changes, and its effects have not been studied. Nevertheless, pointing this out to learners adds to their set of analytic tools, while the teaching of stem changes solely as unidirectional rules is not likely to have this effect.

With the WP approach to Finnish inflection, the main problem is setting the limits for analogy, just as the problem with rules is the constraints and

exceptions. As long as the learning is contained within the walls of the classroom, the teacher can choose the model words and provide new words with an index of some kind, to assign them to word-types. In a natural context, only the words with a morphophonologically unambiguous shape can be thus assigned, and only if they appear in a form which cannot belong to more than one paradigm.[72] The principal parts of nominals are seldom available for acquisition in natural contexts. Again, to benefit from the paradigm-based approach, learners need ways of analyzing the input. They need to learn to listen and to read with an eye for the recurrences of the same word and to compare forms.

The practical problems of application in natural situations, posed both by rule-based and paradigm-based approaches, are rather similar. But does one or the other produce better results, i.e. more correct forms? This question cannot be solved on the basis of the data in this study, as it is not possible to judge by the product which processes underlie it. The topic was approached in the interview data, but it is by no means certain that learners actually do what they claim to do. On the basis of practical experience it can be predicted that analogical processing, based on model words, is more likely to produce correct forms than can be achieved by rule-based instructions, at least as soon as more than one simple stem change is present. This view is simply based on my observations as a teacher: uttering a model word to a hesitant student usually produces an immediate and correct result, while few people can process multiple rules fast, and errors often intervene. This observation, however, assumes the classroom context in which it was made: both rules and model words were systematically taught for each new form, with the statement that it was for each individual to choose which method of presentation they preferred. However, the observation is supported by research results which suggest that it is neurologically easier for human beings to process a great number of words and few rules than many rules and few basic forms (Määttä 1994, 193).

Regardless of whether rules or model-word paradigms are chosen, a number of words must be memorized. But how many? Is it better to encourage students to memorize words and their forms or to point out regularities and patterns? If the prediction of the SAID model is true, native speakers have the stem allomorphs memorized while the actual production process is combining. Stem allomorphs, however, are not very handy in teaching, since most people find it difficult to memorize such non-functional bits and pieces, while whole words in context are easier to remember. An approach which is best in accordance with both current theoretical knowledge and practical experience is the one where learning is first based onto the memorization of word-forms and, as the stock accumulates, the focus moves on the regularities and similarities, thus helping the analysis of further input and reducing the need to memorize all word-forms.

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[72]For example, *sininen* 'blue' is non-ambiguous, while the partitive *sinistä* could also be the elative of the name *Sini*, and it also has a shape common with certain verbs, cf. *siristä* 'to buzz'.

What is the role of teaching, if language production is considered from the connectionist viewpoint? In a way the statement above also serves as an answer to this question. Native speakers develop the network of connections on the basis of input from their environment; for learners the process can be assisted by focusing their attention on the features of the system where the natural building up of connections proves to be weak or erratic, or where this can be expected to be the case.

The partitive plural problem

Whenever I ask a group of teachers of Finnish as a Second Language to name the most difficult teaching problen within nominal inflection, the majority answers that it is the partitive plural. It is problematic also for learners, as the data of this study shows. It is for these reasons that the partitive plural is brought up separately here, although a great deal of what was said above applies to it as well. The problems are also shared by other plural forms, particularly the genitive plural, but the problems usually surface with the partitive plural, as it is frequent and taught as a base for other plural forms.

The partitive plural in Finnish is inherently complex. This shows itself not only in learner data and the data of L1 acquisition studies, but also in normal adult production. Non-conventional forms are often heard, and in the nonce-word test the answers of the control group were by no means unanimous. The interplay of the plural marker and the stem, on the one hand, and the plural marker and the partitive ending, on the other, results in a large number of plural partitive shapes and alternate forms with varying frequency and stylistic value (cf. Siitonen 1990).

The problem for both teachers and learners, who base their approach on linguistic presentations and textbooks, is that they attempt to find order where little exists. Rule presentations prevail, with numerous constraints and exceptions. Some constraints are peculiar, such as using the first vowel of the word as an indicator (p. 73), or deciding the choice of rule according to whether the word is a noun or an adjective (p. 73). Furthermore, as soon as the basic idea of combining has been absorbed, natural acquisition takes care of many forms and words. Requiring the students to learn, for instance, that words ending in *-o*, *-ö*, *-u* or *-y* have no vowel changes before the plural marker *i* is counterproductive. Yet only the most experienced or self-confident teachers seem to have the courage to say: Listen, read and imitate!

Teachers can help, of course, by collecting examples and grouping them by the relationship between the basic form and the partitive plural. Input can be enhanced by stories and rhymes where many partitive plurals appear. Similarities and differences can be pointed out. Some exceptional learners may benefit from some rules or word-type classifications, and can be directed to books which provide them. The great majority, however, will be better served if they never begin to believe that partitives plurals are produced by rules.

Teaching-induced problems

The partitive plural is not the only area where, with perfectly good intentions, problems are sometimes created by teaching. Examples can be found in previous chapters, such as the problems with the linear production of consonant gradation (p. 206), or the multiple case endings (7.2.2). The "problem potential factor", presented in 8.1, can also be partially induced by teaching, but it can also result from spontaneous analysis of input.

These problems are connected with the teaching approach which I call the linearity effect. This is apparent with rules: you start with the basic form, check it for possible stem changes, produce the genitive, remove the ending, and use the stem for other forms. The principal parts of the model words are also presented in a certain order (see 3.2.3), implying linearity. The linearity may even be stronger in the paradigm presentation than with rules, as rules usually branch: for the partitive you start again from the nominative. Several linear sets of rules may also be presented: one starting from each type of stem. In any case, teaching and learning are heavily built on what has been formally learned earlier, and items are not discussed in the order in which they are likely to occur in the input.

The psycholinguistic assumption underlying the linear approach is that in the memory the paradigms of words are like train carriages sitting at a station, with entrance at only one end of the train, where the carriage called the basic form is located. To get to the restaurant carriage at the other end of the train you have to pass through all the carriages on the track in question. No doubt you get there, but you might prefer to get there directly from the station, or at least to get some fresh air when you by-pass the intermediate carriages outside.

Passing through several word-forms to get to the destination also involves zig-zagging. Many textbooks ask the learner to apply the consonant gradation rules to the nominative to achieve the genitive, then take off the genitive ending and add an inessive ending, for example, or if the learner has made it that far, to remove the partitive ending in the plural to make space for another case suffix. A step forgotten on the way leads into forms such as *tyttöjällä* (*tyttö* 'girl' + pl. + partit. + adess.) or *kengänssä* (*kenkä* 'shoe' + gen. + iness.), which can be found neither in the input nor in spontaneously acquired interlanguage.

A simple way to avoid the linearity effect is to organize the forms to be compared in visually varying ways, on top of each other, as circles, etc. In instructional speech the order of forms can also be varied. One can also search for memory aids other than the mindless rattling off of principal parts or other lists, which cause language learners, decades after leaving school, to stop in the middle of a sentence to go down a list until the right form is located.

Nominal inflection is not the whole language

This study involves only nominals. That other large and complex area of morphology, verb conjugation, is in some ways even more complex in Finnish

than the noun declension.[73] Yet, as the same brain handles both nominals and verbs, many of the results are likely to be true of verbs as well. This view is not only based on generalizations of the principles presented above but is also confirmed by data on verbs. It is not, however, possible to dwell on this issue within the present study.

In addition to nominals and verbs, a learner meets many other things. Words in a language are connected to each other not only by form but, more importantly for the users of the language, by meaning and context; after all, similarity and proximity are basic operating principles of human cognition (cf. 2.4). Thus the teaching of morphology must present words in relation to other words and in relation to the world. This requires relevant input, authentic material. Nonetheless, producing language solely for teaching purposes is necessary, as everything cannot be learnt at once. But rather than being the input, it should be directed towards developing the strategies which are necessary for analysing genuine input.

There are some, often mathematically-minded, students who study Finnish because its inflection can be so beautifully and systematically expressed by rules. The majority of students, however, might be better motivated by the knowledge that neither the system nor native speakers are perfect, particularly if this information translates into the acceptance of less than perfect production as a viable stage in learning.

As a linguist one spends years and decades researching, discussing, and contemplating tiny details of language, the importance of which may be impossible to explain to the people whose language is being studied. This connection between linguistics and language becomes exceedingly odd as one does research on the same language one uses as a means of thinking and communication every day. Pirsig (1991, 360–361) in his novel *Lila*, which centres around practising philosophy, creates the concept of philosophology. This relates to philosophy in the same way as art history relates to art or musicology with music. Pirsig wonders if philosophology is not a parasite, a secondary creature which imagines that it is controlling its host by analyzing and intellectualizing it. The relationship between linguistics and language can be seen in the same way. It is, therefore, of essential importance not to lose sight of the fact that nominal inflection is only a small part of language: communication between human beings requires much more.

The map and the rope

Earlier (in 8.1), the nominal inflection of Finnish was visualized as a relief map. The learning of it can be paralleled to a rope, necessary for climbing the mountains. The individual strands of the rope first consist of linguistic processes and materials which are universal or common to Finnish and the mother tongue

[73] The number of inflectional types for verbs is much smaller than that for nominals, but the number of inflectional morphemes which can be added to verb stems is considerably larger, since infinitive and participle forms can be used as nominals and therefore receive all the nominal morphemes as well as the verb morphemes.

or other languages known to the learner. As learning progresses, other strands, specific to Finnish inflection, are added. Their thickness varies, but gradually they grow stronger and longer. The strands twist around each other, and looking at the rope at any one point, it is not possible to discern where they come from and to what extent each of them is in contact with the others. But finally the rope is strong enough to swing from one mountain top to another as confidently as native speakers do.

The scenery to be mapped surrounds the learner. S/he also posseses a compass, the cognitive processes common to all human beings, such as the general ability to analyze, compare and remember. The teacher's task is to provide a rough version of the map, for the learner to mould. S/he locates some landmarks on the map, and as the input drops upon him, helps the learner to catch it and to place it where it belongs. The teacher also watches the rope, and offers extra strands when it is too thin to support the learner.

Modelling maps or language is never easy. Be it produced by native speakers or learners, even this tiny part of language, called nominal inflection, effectively defies definition and categorization. The danger of losing oneself among the details of the scenery is for ever present. I sincerely hope that the thoughts presented in this book will eventually help teachers to see the wood for the trees and learners to reach the mountain tops.

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LIST OF TABLES

APPENDIX 1

THE RESULTS OF THE INFLECTION TEST (CHAPTER 5)

For each test word, the stimulus form is listed in the first column. Below that are the numbers of the different genitive singular and partitive plural forms produced by the test subjects. All the genitive singular and partitive plural forms are listed in the second and third columns respectively. The number next to each form refers to the number of subjects who produced the given form. For the real words the standard form is listed first. For the nonce words the first form is the one which rhymes with the corresponding real word-form. Below these, the suggested forms are listed in order of frequency. A dash indicates no response.

THE TEST GROUP (N = 35)

asaite	asaitteen	3	asaitteita	3
gen.sg. 5	asaiten	24	asaitia	8
part.pl. 16	asaiteen	2	asaiteja	3
	asaitsen	2	asaitea	3
	asain	1	asaitta	2
	—	3	asaiteita	2
			asaitee	1
			asaitija	1
			asaitsia	1
			asaitie	1
			asatteita	1
			asaitettä	1
			asaittia	1
			asaiteta	1
			ansaitseita	1
			asiaiten	1
			—	4
avain	avaimen	18	avaimia	12
gen.sg. 8	avain	6	avainta	4
part.pl. 18	avainen	5	avaita	2
	avaimmen	2	avaisia	2
	avaiten	1	avaina	2
	avaen	1	avain	1
	avainnan	1	avaineja	1
	avaisen	1	avainenia	1
			avaien	1
			avaimmia	1
			avaimet	1
			avaimie	1
			avaimmeita	1
			avaitia	1
			avaimeta	1
			avaineita	1
			avainoja	1
			avainia	1

enneton	ennettoman	4	ennettomia	4
gen.sg. 13	enneton	5	ennetonta	4
part.pl. 16	ennetomen	4	ennetomia	4
	ennetonen	4	ennetoja	2
	ennetoman	3	ennetoita	2
	ennetonnen	3	ennetonia	2
	ennetoja	1	ennetonesia	1
	ennetoen	1	ennetien	1
	ennetömän	1	ennettä	1
	ennettoksen	1	ennetoijia	1
	ennetosen	1	ennetömiä	1
	ennetten	1	ennetonnia	1
	ennetonten	1	ennetoksia	1
	—	5	ennetontoa	1
			ennetoa	1
			enneton	1
			—	7
halka	halan	12	halkoja	8
gen.sg. 5	halkan	17	halkia	8
part.pl. 16	hallan	2	halkija	2
	haljan	1	halkaita	2
	halven	1	haloja	1
	—	2	halleja	1
			halkea	1
			halia	1
			halja	1
			halkasia	1
			halkoita	1
			hallia	1
			halkkia	1
			halkaa	1
			halaa	1
			halkata	1
			—	3
hesi	heden	15	hesiä	13
gen.sg. 5	hesin	11	hesia	6
part.pl. 12	hesen	5	hettä	3
	hesten	1	hesita	2
	heen	1	hedejen	1
	—	2	hesija	1
			hedia	1
			hetta	1
			hesijä	1
			hesejä	1
			hedeita	1
			hesietä	1
			—	3
hieras	hieraan	13	hieraita	14
gen.sg. 8	hieran	9	hierasia	4
part.pl. 9	hierasen	3	hieraksia	3
	hieraksen	2	hieria	2

	hierasksen	1	hierasta	2
	hieraen	1	hieraa	2
	hierasin	1	hiereitä	1
	hieranen	1	hierata	1
	—	4	hieroja	1
			—	5
härki	härkin	9	härkiä	17
gen.sg. 10	härken	7	härkkiä	4
part.pl. 9	härän	6	härkejä	3
	härkän	2	härkeitä	3
	hären	2	härkijä	1
	härin	2	härkäitä	1
	härven	1	harkija	1
	härgin	1	harkia	1
	harken	1	härkineia	1
	harkan	1	—	3
	—	3		
ipas	ippaan	6	ippaita	4
gen.sg. 12	ipaan	7	ipaita	5
part.pl. 14	ipasen	4	ipasia	4
	ipan	3	ipoja	3
	ipasin	2	ipaksia	2
	ipanen	1	ipasta	2
	ipasten	1	ipeitä	1
	ipasksen	1	ipastia	1
	ippan	1	ipasksia	1
	ipaen	1	ipaisia	1
	ivanen	1	ippiä	1
	ipas	1	ipataa	1
	—	6	ipaa	1
			ipanetta	1
			—	7
isompi	isomman	7	isompia	21
gen.sg. 16	isompin	8	isompija	2
part.pl. 10	isommin	4	isoimpia	1
	isommen	2	isompeja	1
	isompi	2	isompaa	1
	isommän	1	isoimpia	1
	isompen	1	isompiä	1
	isompten	1	isomveja	1
	isomvin	1	isoa	1
	isoman	1	isota	1
	isompan	1	—	4
	isoimmin	1		
	isomin	1		
	isonen	1		
	ison	1		
	osommin	1		
	—	1		

ivain	ivaimen	11	ivaimia	8
gen.sg. 9	ivainen	7	ivainta	5
part.pl. 14	ivain	7	ivaita	2
	ivaisen	3	ivaisia	2
	ivaen	1	ivaina	2
	ivaijen	1	ivaineja	1
	ivaan	1	ivainen	1
	ivaimmen	1	ivania	1
	ivaiten	1	ivanoita	1
	—	2	ivaampia	1
			ivainea	1
			ivaitia	1
			ivaneita	1
			ivainia	1
			—	7
jalka	jalan	22	jalkoja	17
gen.sg. 7	jalkan	6	jalkia	5
part.pl. 8	jallan	3	jalkaa	3
	jalkaa	1	jalat	3
	jaljen	1	jaloi	1
	jallanen	1	jaloita	1
	jalka	1	jaljeita	1
			jalaa	1
			—	3
jampa	jamman	11	jampoja	11
gen.sg. 5	jampan	14	jampia	8
part.pl. 9	jaman	3	jampaa	2
	jampaan	1	jampoija	1
	jammanen	1	jamppoja	1
	—	5	jampasia	1
			jammia	1
			jamaa	1
			jampata	1
			—	8
järki	järjen	9	järkiä	11
gen.sg. 9	järken	9	järkijä	5
part.pl. 11	järkin	4	järkeä	4
	jarkin	4	järkejä	2
	jären	2	järkeja	2
	järin	2	jarkeja	1
	järien	1	järietä	1
	järki	1	jarkinia	1
	järvenen	1	järitä	1
	—	2	järinä	1
			järjet	1
			—	5
kainen	kaisen	18	kaisia	10
gen.sg. 8	kainen	5	kainoja	3
part.pl. 14	kainenen	2	kainia	2
	kaineen	2	kainea	2

	kainemen	1	kaineneja	1
	kaine	1	kainta	1
	kaisten	1	kaineita	1
	kainensen	1	kaineja	1
	—	4	kaisenta	1
			kainensia	1
			kaineia	1
			kainenta	1
			kaiseita	1
			kainenia	1
			—	8
kampa	kamman	20	kampoja	11
gen.sg. 5	kampan	9	kampia	8
part.pl. 11	kampa	1	kampaa	2
	kaman	1	kampaita	2
	kampaan	1	kammoja	1
	—	3	kampaat	1
			kampoita	1
			kammaa	1
			kampaja	1
			kammat	1
			pampaja	1
			—	5
katu	kadun	24	katuja	20
gen.sg. 3	katun	9	katua	4
part.pl. 10	katua	2	katuita	2
			katoja	2
			katuija	1
			katui	1
			katia	1
			katujen	1
			katuita	1
			kadua	1
			kutuja	1
kauneus	kaudeuden	4	kauneuksia	8
gen.sg. 12	kauneuksen	8	kauneusia	3
part.pl. 14	kauneun	5	kauneita	2
	kauneusen	3	kauneutta	2
	kauniin	2	kauneusija	1
	kauneusin	1	kaunoja	1
	kauneusta	1	kauneuksija	1
	kaunis	1	kauniita	1
	kauneus	1	kaunilta	1
	kauneen	1	kauneua	1
	kaunin	1	kauneoista	1
	kaunen	1	kauneisia	1
	—	6	kauneusta	1
			kauneukseita	1
			—	10

kauppa	kaupan	27	kauppoja	17
gen.sg. 2	kauppan	8	kauppia	6
part.pl. 9			kaupoja	3
			kaupaa	3
			kauppaa	1
			kaupaia	1
			kaupojen	1
			kauppiaa	1
			kaupuja	1
			—	1
keitto	keiton	23	keittoja	18
gen.sg. 5	keitton	7	keittoa	4
part.pl. 5	keittoa	1	keitoa	2
	keittoon	1	keitoja	2
	keiden	1	keittoija	1
	—	2	keittiä	1
			keittia	1
			—	6
kenkä	kengän	19	kenkiä	20
gen.sg. 6	kenkän	9	kenkijä	2
part.pl. 11	kengan	3	kengiä	2
	kenkiä	1	kenkää	2
	kengen	1	kenkia	1
	kenken	1	kengejä	1
	—	1	kenkäjä	1
			kenkejä	1
			kengää	1
			kengät	1
			kenkät	1
			—	2
kerros	kerroksen	16	kerroksia	13
gen.sg. 11	kerron	7	kerroja	6
part.pl. 11	kerrosen	3	kerroa	3
	kerroon	2	kerroseija	1
	kerosen	1	keroa	1
	kerroen	1	keroja	1
	kerrosin	1	kerroksija	1
	keron	1	kerroista	1
	keroen	1	kertoa	1
	kerroksessa	1	kerroita	1
	kerros	1	kerrokseita	1
			—	5
koulu	koulun	32	kouluja	23
gen.sg. 4	koulujen	1	koulua	8
part.pl. 5	kouluen	1	koulujen	1
	kouluun	1	kouluita	1
			kouluia	1
			—	1

kukka	kukan	26	kukkia	21
gen.sg. 4	kukkan	5	kukkija	2
part.pl. 11	kukat	1	kukkeja	1
	kukkaan	1	kukkaja	1
	—	2	kukkoja	1
			kukkeita	1
			kukkaa	1
			kukia	1
			kukiä	1
			kukkien	1
			kukaa	1
			—	3
käivä	käivän	24	käiviä	15
gen.sg. 8	käipän	3	käivoja	3
part.pl. 9	kaivän	2	käivia	2
	käivää	1	käivää	2
	kaivan	1	käivejä	2
	käipään	1	käiväjä	2
	käivään	1	käivitä	1
	kävi	1	käivät	1
	—	1	kavivia	1
			—	6
laiva	laivan	34	laivoja	17
gen.sg. 2	laivaa	1	laivia	7
part.pl. 9			laivaa	2
			laiveja	1
			laivojen	1
			laivoia	1
			laivat	1
			laivaja	1
			laivata	1
			—	3
leipä	leivän	27	leipiä	17
gen.sg. 2	leipän	8	leipää	3
part.pl. 12			leipoja	3
			leipäjä	2
			leivät	2
			leipöjä	1
			leivoja	1
			leipia	1
			leipijä	1
			leipejä	1
			leivää	1
			leipien	1
			—	1
leitto	leiton	24	leittoja	21
gen.sg. 4	leitton	8	leittoa	4
part.pl. 8	leition	1	leitoja	2
	leitto	1	leitoa	2
	—	1	leittejä	1

			leittioa	1
			leittia	1
			laitia	1
			—	2
lerros	lerroksen	13	lerroksia	11
gen.sg. 8	lerron	8	lerroja	6
part.pl. 12	lerosen	6	lerrosia	3
	lerrosen	1	lerroa	2
	leron	1	lerrosija	1
	lerioen	1	lerosia	1
	leirros	1	lerrosta	1
	lerrosin	1	lerroksija	1
	—	3	leirroita	1
			lerosta	1
			lerrokseita	1
			leroa	1
			—	5
limi	limen	14	limiä	10
gen.sg. 4	limin	15	limia	5
part.pl. 10	limia	1	limejä	3
	limisen	1	limijä	3
	—	4	limoja	2
			limeja	1
			limisiä	1
			limeitä	1
			limeä	1
			limita	1
			—	7
lyhyt	lyhyen	16	lyhyitä	6 *)
gen.sg. 6	lyhyn	12	lyhyjä	11
part.pl. 13	lyhykäinen	2	lyhyä	3
	lyhyeden	1	lyhyttä	2
	lyhyjen	1	lyhyjen	2
	lyhynen	1	lyhkäset	1
	—	3	lyhykäisiä	1
			lyhyiä	1
			lyhyempiä	1
			lyhyejä	1
			lyhytä	1
			lyhytiä	1
			lyhyneja	1
			—	4
muoli	muolin	15	muoleja	1
gen.sg. 4	muolen	13	muolia	16
part.pl. 9	muolan	1	muolija	3
	muolia	1	muolejä	1
	—	5	muolineja	1
			muoleä	1
			muolijä	1
			muoleita	1
			muoloja	1
			—	9

*) Yksi vastaaja oli antanut kaksi vastausta.

nainen	naisen	26	naisia	21
gen.sg. 5	nainen	4	naista	4
part.pl. 8	naisten	2	naisien	2
	naiset	1	naisiä	1
	naista	1	naiseita	1
	—	1	nainia	1
			naisoita	1
			naiset	1
			—	3
nimi	nimen	23	nimiä	14
gen.sg. 6	nimin	7	nimia	3
part.pl. 10	nimeni	1	nimeja	3
	nimia	1	nimeä	3
	nimän	1	nimijä	2
	nimi	1	nimeitä	2
	—	1	nimija	1
			nimea	1
			nimeija	1
			nimejä	1
			—	4
onneton	onnettoman	5	onnettomia	6
gen.sg. 12	onneton	7	onnetomia	4
part.pl. 14	onnetomen	4	onnetoa	3
	onnetonen	3	onnetoneja	2
	onnetonnen	2	onnetia	1
	onneten	2	onnetoksia	1
	onnetoman	1	onnetoja	1
	onnetoon	1	onnetontia	1
	onnetoksen	1	onnetomentä	1
	onneon	1	onetoijan	1
	onnetosen	1	onneta	1
	onnetonta	1	onnetonta	1
	—	6	onnetuja	1
			onnea	1
			—	10
opas	oppaan	6	oppaita	8
gen.sg. 11	opaan	8	opaita	6
part.pl. 13	opan	6	opasia	2
	opasen	3	opasta	2
	opaksen	2	opaksia	1
	opasksen	1	opaseja	1
	opaden	1	opasteja	1
	opaseen	1	oppaata	1
	opasin	1	opaskiileita	1
	opasta	1	oppia	1
	opas	1	opata	1
	—	4	opia	1
			opaa	1
			—	8

osoite	osoitteen	6	osoitteita	5
gen.sg. 6	osoiten	14	osoiteita	4
part.pl. 17	osoiteen	8	osoitia	4
	osoiden	3	osoiteja	3
	osoitten	2	osoitija	2
	osoiteni	1	osoiteijä	1
	—	1	osoitien	1
			osotemme	1
			osoteita	1
			osoita	1
			osoitteta	1
			osoitaa	1
			osoitetta	1
			osoiteta	1
			osoida	1
			osoiten	1
			osoitee	1
			—	5
osompi	osomman	4	osompia	19
gen.sg. 12	osompin	9	osompiä	2
part.pl. 9	osommin	7	osompija	1
	osommen	3	osompijen	1
	osompen	2	osoimiä	1
	osoman	1	osomia	1
	osompia	1	osoimpia	1
	osomvin	1	osompeja	1
	osoimmin	1	osompita	1
	osompiin	1	—	7
	osomin	1		
	osompi	1		
	—	3		
patu	padun	15	patuja	18
gen.sg. 5	patun	14	patua	6
part.pl. 6	padu	1	patoja	2
	paduun	1	padua	1
	patuun	1	padumpia	1
	—	3	patuijen	1
			—	6
pauko	pauon	7	paukoja	11
gen.sg. 5	paukon	20	paukoa	5
part.pl. 8	paukun	1	paukoita	3
	paukoon	1	paukkoja	3
	paukoa	1	paukoia	2
	—	5	paukua	1
			paukia	1
			paukoneja	1
			—	8
perhe	perheen	18	perheitä	21
gen.sg. 4	perhen	15	perheita	3
part.pl. 9	perhejan	1	perhetta	2
	perheni	1	perheija	1

			perheiten	1
			perhoja	1
			perheisiä	1
			perhejä	1
			perhe	1
			—	3
poika	pojan	30	poikia	20
gen.sg. 3	poikan	4	poikkia	2
part.pl. 11	poikani	1	poikaa	2
			pojat	2
			poikija	1
			poikeä	1
			poikien	1
			pikia	1
			poikaja	1
			pohjat	1
			pojaa	1
			—	2
poulu	poulun	27	pouluja	16
gen.sg. 5	poulua	1	poulua	7
part.pl. 6	pouluja	1	poulia	1
	pouluun	1	pouluita	1
	poulu	1	pouluneja	1
	—	4	poulujien	1
			—	8
puhelin	puhelimen	17	puhelimia	11
gen.sg. 9	puhelin	5	puhelinta	4
part.pl. 14	puhelimmen	2	puhelia	3
	puhelen	2	puhelinia	2
	puhelisen	2	puheliota	1
	puhelinen	2	puhelimitten	1
	puhelemin	1	puhelineita	1
	puheljan	1	puhelisia	1
	puhelian	1	puhelimiä	1
	—	2	puhelimeitä	1
			puhelietta	1
			pehelimiä	1
			puhelija	1
			puhele	1
			—	5
pukka	pukan	25	pukkia	15
gen.sg. 3	pukkan	6	pukkoja	3
part.pl. 10	pukkaan	1	pukkaita	3
	—	3	pukkija	2
			pukaa	2
			pukia	1
			pukkiä	1
			pukkuja	1
			pukkaja	1
			pukoja	1
			—	5

pyhyt	pyhyen	13	pyhyitä	7
gen.sg. 7	pyhyn	10	pyhyjä	10
part.pl. 10	pyhyten	2	pyhyä	3
	pyhän	1	pyhytä	2
	pyhdyn	1	pyhysiä	1
	pyhyjen	1	pyhyttiä	1
	pyhyt	1	pyhia	1
	—	6	pyhytia	1
			puhujia	1
			pyhien	1
			—	7
päivä	päivän	29	päiviä	23
gen.sg. 5	paivän	2	päivää	4
part.pl. 7	päivan	2	paivia	2
	päivää	1	päivätä	2
	päiviään	1	päivoja	1
			päivät	1
			päivien	1
			—	1
raiva	raivan	28	raivoja	9
gen.sg. 4	raipan	3	raivia	12
part.pl. 9	raivaa	1	raivaa	2
	raivaan	1	raivaita	2
			raivata	2
			raivoa	1
			raivaia	1
			raivat	1
			raivää	1
			—	4
reipä	reivän	14	reipiä	12
gen.sg. 7	reipän	13	reiviä	4
part.pl. 15	reipään	2	reipää	3
	revin	1	reivoja	1
	reikän	1	reipia	1
	reipää	1	repivät	1
	reipan	1	reipättä	1
	—	2	reipäittä	1
			reippia	1
			reivät	1
			reipäitä	1
			reipä	1
			reipäjä	1
			reivää	1
			reippiä	1
			—	4
rilta	rillan	17	riltoja	12
gen.sg. 8	riltan	8	riltia	5
part.pl. 12	riltaan	2	riltaja	2
	riltaa	1	riltiä	2

	rilsen	1	riltaa	2
	riltaja	1	rilsiä	1
	rildan	1	rilliä	1
	rillin	1	rilloja	1
	—	3	rillaa	1
			riltoa	1
			riltaat	1
			riltaita	1
			—	5
silta	sillan	19	siltoja	13
gen.sg. 5	siltan	9	siltia	4
part.pl. 13	siltaan	2	siltaa	3
	sildan	1	siltaja	2
	siltaa	1	siltija	1
	—	3	silteja	1
			siltojen	1
			siltaat	1
			silloja	1
			sillaa	1
			siltoa	1
			siltiä	1
			siltaneja	1
			—	4
tauko	tauon	13	taukoja	16
gen.sg. 9	taukon	13	taukoa	4
part.pl. 9	taukoa	1	taukia	3
	taukoja	1	taukoita	2
	taugon	1	taukoo	1
	taukoo	1	taukojen	1
	taukoon	1	taukoaa	1
	taulon	1	taukot	1
	tauvon	1	tauloa	1
	—	2	—	5
tauneus	tauneuden	2	tauneuksia	10
gen.sg. 8	tauneuksen	11	tauneusia	3
part.pl. 16	tauneusen	7	tauneita	2
	tauneun	5	tauneuseja	1
	tauneen	2	taunita	1
	tauksen	1	tauneusita	1
	taunen	1	tauneuksija	1
	tauneus	1	tauneusta	1
	—	5	taunoja	1
			tauneuset	1
			tauneuta	1
			tauneta	1
			tauneus	1
			tauneua	1
			taune	1
			tauneukseita	1
			—	7

tauppa	taupan	27	tauppoja	11
gen.sg. 2	tauppan	4	tauppia	8
part.pl. 8	—	4	taupaa	4
			tauppaa	1
			taupia	1
			taupoja	1
			tauppiä	1
			tauppaat	1
			—	7
tenkä	tengän	15	tenkiä	15
gen.sg. 9	tenkän	8	tenkää	3
part.pl. 12	tengan	2	tengiä	2
	tenkää	1	tenniä	1
	tenjän	1	tenkaita	1
	tenän	1	tengää	1
	tenkään	1	tenkkiä	1
	tennän	1	tenkejä	1
	tengen	1	tenkoja	1
	—	4	tenkäjä	1
			tennää	1
			tenkäät	1
			—	6
terhe	terheen	13	terheitä	11
gen.sg. 4	terhen	16	terhiä	4
part.pl. 12	teren	1	terhejä	3
	terheja	1	terheita	2
	—	4	terhettä	2
			terheä	1
			terheta	1
			tereä	1
			terheidä	1
			terhoja	1
			terheet	1
			terhe	1
			—	6
toika	tojan	11	toikia	18
gen.sg. 7	toikan	13	toikaa	3
part.pl. 12	toian	5	toiseja	1
	toisen	1	toikaita	1
	toigan	1	toitä	1
	toikaan	1	toikiä	1
	toikaa	1	toikkija	1
	—	2	toikkia	1
			toikat	1
			toikaja	1
			toiaa	1
			toikoa	1
			—	4

tuhelin	tuhelimen	13	tuhelimia	8
gen.sg. 9	tuhelin	5	tuhelinta	6
part.pl. 10	tuhelinen	3	tuhelia	4
	tuhelisen	3	tuhelinia	3
	tuhelen	2	tuheliseja	1
	tuhelimmen	2	tuhelitta	1
	tuhelemin	1	tuheleitä	1
	tuheleen	1	tuhelija	1
	tuhellija	1	tuhelineita	1
	—	4	tuhele	1
			tuhelimiä	1
			—	7
tuoli	tuolin	23	tuoleja	11
gen.sg. 4	tuolen	9	tuolia	12
part.pl. 8	tuolija	1	tuolija	3
	tuoliin	1	tuoleä	1
	—	1	tuolejä	1
			tuoleita	1
			tuolitten	1
			tuolien	1
			tuolia/tuoleja	1
			—	3
vesi	veden	25	vesiä	14
gen.sg. 6	vesin	5	vettä	13
part.pl. 7	veen	2	vesia	2
	veten	1	vedejä	1
	vedän	1	vettää	1
	vettä	1	vesien	1
			vettäjä	1
			—	2
vieras	vieraan	15	vieraita	17
gen.sg. 6	vieran	10	vierasia	3
part.pl. 13	vierasen	4	vieraa	2
	vieraksen	3	vieraksia	1
	vieraen	1	vieroita	1
	vieren	1	vierata	1
	—	1	vieraiden	1
			vieraisija	1
			vieroja	1
			vieraja	1
			viereitä	1
			viertaa	1
			vieroa	1
			—	3

THE CONTROL GROUP (N = 25)

asaite	asaitteen	3	asaitteita	3
gen.sg. 3	asaiten	20	asaiteja	5
part.pl. 14	ansaitteen	2	asaitia	3
			asaita	3
			asaiteita	2
			asaitija	1
			asaitoja	1
			asaimia	1
			asaitemia	1
			asaitta	1
			asaitteja	1
			ansaitteita	1
			ansaimia	1
			saita	1
avain	avaimen	24	avaimia	24
gen.sg. 2	avaimmen	1	avaimmia	1
part.pl. 2				
enneton	ennettoman	16	ennettomia	18
gen.sg. 6	ennetonen	2	ennetonia	2
part.pl. 5	ennetonin	2	ennetomia	1
	ennetoman	1	ennetonta	1
	ennetonnen	1	ennetoneja	1
	ennettomen	1	—	2
halka	halan	9	halkoja	8
gen.sg. 3	halkan	15	halkia	7
part.pl. 5	halgan	1	halkaja	5
			halkaimia	3
			halkaita	2
hesi	heden	8	hesiä	17
gen.sg. 3	hesin	14	hesejä	4
part.pl. 6	hesen	2	hetiä	1
			hesijä	1
			heseitä	1
			veden	1
hieras	hieraan	20	hieraita	19
gen.sg. 3	hieraksen	4	hieraksia	3
part.pl. 3	hieraan/		hieroja	3
	hieraksen	1		
härki	härjen	9	härkiä	18
gen.sg. 6	härkin	9	härkimiä	1
part.pl. 8	hären	3	härkejä	1
	härin	2	härkeitä	1
	härän	1	härköjä	1
	härkiän	1	härskejä	1
			härkit	1
			härjen	1

ipas	ippaan	11	ippaita	7
gen.sg. 5	ipaan	7	ipaita	8
part.pl. 7	ipaksen	4	ipaksia	4
	ipasen	2	ipasia	3
	ipan	1	ippoja	1
			ipoja	1
			ippaimia	1
isompi	isomman	21	isompia	25
gen.sg. 5	isompin	1		
part.pl. 1	isommin	1		
	isompan	1		
	isompien	1		
ivain	ivaimen	20	ivaimia	18
gen.sg. 5	ivainmen	2	ivaita	2
part.pl. 6	ivailin	1	ivampia	1
	ivainen	1	ivaimija	1
	ivan	1	ivailia	1
			ivainpia	1
			—	1
jalka	jalan	25	jalkoja	25
gen.sg. 1				
part.pl. 1				
jampa	jamman	5	jampoja	22
gen.sg. 5	jampan	17	jampaita	1
part.pl. 4	jaman	1	jampaimia	1
	jampa	1	kampoja	1
	kamman	1		
järki	järjen	24	järkiä	19
gen.sg. 2	jären	1	järkeä	3
part.pl. 4			järkejä	2
			järkijä	1
kainen	kaisen	13	kaisia	12
gen.sg. 7	kainen	6	kainia	6
part.pl. 8	kaineen	2	kaineita	2
	kain	1	kainensia	1
	kaimenen	1	kaineja	1
	kaikaimen	1	kaisenia	1
	kaineksen	1	kaineksia	1
			kaikaimia	1
kampa	kamman	25	kampoja	25
gen.sg. 1				
part.pl. 1				

katu	kadun	25	katuja	25
gen.sg. 1				
part.pl. 1				
kauneus	kauneuden	25	kauneuksia	20
gen.sg. 1			kauneutta	4
part.pl. 3			kauniita	1
kauppa	kaupan	24	kauppoja	25
gen.sg. 2	kauppojen	1		
part.pl. 1				
keitto	keiton	25	keittoja	23
gen.sg. 1			keittoa	2
part.pl. 2				
kenkä	kengän	25	kenkiä	25
gen.sg. 1				
part.pl. 1				
kerros	kerroksen	25	kerroksia	25
gen.sg. 1				
part.pl. 1				
koulu	koulun	25	kouluja	25
gen.sg. 1				
part.pl. 1				
kukka	kukan	25	kukkia	24
gen.sg. 1			kukia	1
part.pl. 1				
käivä	käivän	24	käiviä	24
gen.sg. 2	käiviän	1	käipiä	1
part.pl. 2				
laiva	laivan	25	laivoja	25
gen.sg. 1				
part.pl. 1				
leipä	leivän	25	leipiä	24
gen.sg. 1			leipää	1
part.pl. 2				
leitto	leiton	24	leittoja	25
gen.sg. 2	leidon	1		
part.pl. 1				

lerros	lerroksen	23	lerroksia	23
gen.sg. 2	lerron	2	lerroja	1
part.pl. 3			lertoja	1
limi	limen	10	limiä	14
gen.sg. 2	limin	15	limejä	11
part.pl. 2				
lyhyt	lyhyen	25	lyhyitä	24
gen.sg. 1			lyhyviä	1
part.pl. 2				
muoli	muolin	14	muoleja	8
gen.sg. 2	muolen	11	muolia	16
part.pl. 3			muolija	1
nainen	naisen	25	naisia	25
gen.sg. 1				
part.pl. 1				
nimi	nimen	25	nimiä	24
gen.sg. 1			nimijä	1
part.pl. 2				
onneton	onnettoman	24	onnettomia	25
gen.sg. 2	onnetteen	1		
part.pl. 1				
opas	oppaan	24	oppaita	24
gen.sg. 2	opaksen	1	opaksia	1
part.pl. 2				
osoite	osoitteen	25	osoitteita	24
gen.sg. 1			osoittimia	1
part.pl. 2				
osompi	osomman	17	osompia	23
gen.sg. 4	osommin	6	osompeja	1
part.pl. 3	osompin	1	isompia	1
isomman	1			
patu	padun	8	patuja	25
gen.sg. 2	patun	17		
part.pl. 1				
pauko	pauon	5	paukoja	20
gen.sg. 2	paukon	20	paukkoja	5
part.pl. 2				

perhe	perheen	25	perheitä	25
gen.sg. 1				
part.pl. 1				
poika	pojan	23	poikia	25
gen.sg. 3	poijan	1		
part.pl. 1	poian	1		
poulu	poulun	24	pouluja	24
gen.sg. 2	polun	1	polkuja	1
part.pl. 2				
puhelin	puhelimen	24	puhelimia	25
gen.sg. 2	puhelin	1		
part.pl. 1				
pukka	pukan	5	pukkia	22
gen.sg. 1			pukkaita	2
part.pl. 3			pukkoja	1
pyhyt	pyhyen	18	pyhyitä	19
gen.sg. 4	pyhyn	4	pyhtyjä	3
part.pl. 4	pyhtyn	2	pyhiä	2
	pyhdy	1	pyhyjä	1
päivä	päivän	25	päiviä	25
gen.sg. 1				
part.pl. 1				
raiva	raivan	25	raivoja	12
gen.sg. 1			raivia	10
part.pl. 4			raivaita	2
			raiveja	1
reipä	reivän	15	reipiä	22
gen.sg. 2	reipän	9	reiväitä	1
part.pl. 3	—	1	reipijä	1
			—	1
rilta	rillan	15	riltoja	25
gen.sg. 2	riltan	9		
part.pl. 1	—	1		
silta	sillan	25	siltoja	25
gen.sg. 1				
part.pl. 1				

tauko	tauon	25	taukoja	25
gen.sg. 1				
part.pl. 1				
tauneus	tauneuden	22	tauneuksia	22
gen.sg. 2	tauneuksen	3	tauneutta	1
part.pl. 4			tauneita	1
			tauneja	1
tauppa	taupan	23	tauppoja	24
gen.sg. 3	tauppan	1	tauppia	1
part.pl. 2	taupojen	1		
tenkä	tengän	20	tenkiä	21
gen.sg. 2	tenkän	4	tenköjä	1
part.pl. 4	—	1	tengiä	1
			tenkkoja	1
terhe	terheen	20	terheitä	18
gen.sg. 2	terhen	5	terhiä	5
part.pl. 4			terhejä	1
			terhoja	1
toika	tojan	5	toikia	13
gen.sg. 3	toikan	19	toikkia	9
part.pl. 4	toian	1	toikkoja	2
			toikkaja	1
tuhelin	tuhelimen	21	tuhelimia	23
gen.sg. 4	tuhelin	2	tuhelinia	1
part.pl. 3	tuhelinen	1	tuhelia	1
	tuhelinin	1		
tuoli	tuolin	25	tuoleja	16
gen.sg. 1			tuolia	8
part.pl. 2			—	1
vesi	veden	25	vesiä	21
gen.sg. 1			vettä	2
part.pl. 4			vesijä	1
			vesiä/vettä	1
vieras	vieraan	25	vieraita	24
gen.sg. 1			vieraat	1
part.pl. 2				

APPENDIX 2

VARIABILITY OF THE RESPONSES OF THE CONTROL GROUP (N = 25)

	All responses		Responses given by only one subject removed	
	sg. gen.	pl. pt.	sg. gen.	pl. pt.
asaite	3	14	3	5
avain	2	2	1	1
enneton	6	5	3	2
halka	3	5	2	5
hesi	3	6	3	2
hieras	3	3	2	3
härki	6	8	4	1
ipas	5	7	4	4
isompi	5	1	1	1
ivain	5	6	2	2
jalka	1	1	1	1
jampa	5	4	2	1
järki	2	4	1	2
kainen	7	8	3	3
kampa	1	1	1	1
katu	1	1	1	1
kauneus	1	3	1	1
kauppa	2	1	1	1
keitto	1	2	1	1
kenkä	1	1	1	1
kerros	1	1	1	1
koulu	1	1	1	1
kukka	1	2	1	1
käivä	2	2	1	1
laiva	1	1	1	1
leipä	1	2	1	1
leitto	2	1	1	1
lerros	2	3	2	1
limi	2	2	2	2
lyhyt	1	2	1	1
muoli	2	3	2	2
nainen	1	1	1	1
nimi	1	2	1	1
onneton	2	1	1	1
opas	2	2	1	1
osoite	1	2	1	1
osompi	4	3	2	1
patu	2	1	2	1
pauko	2	2	2	2
perhe	1	1	1	1
poika	3	1	1	1

poulu	2	2	1	1
puhelin	2	1	1	1
pukka	1	3	1	2
pyhyt	4	4	3	3
päivä	1	1	1	1
raiva	1	4	1	3
reipä	2	3	2	1
rilta	2	1	2	1
silta	1	1	1	1
tauko	1	1	1	1
tauneus	2	4	2	1
tauppa	3	2	1	1
tenkä	2	4	2	1
terhe	2	4	2	2
toika	3	4	2	3
tuhelin	4	3	2	1
tuoli	1	2	1	2
vesi	1	4	1	2
vieras	1	2	1	1
Totals	134	169	93	92

APPENDIX 3

CODES USED TO INDICATE THE SOURCE OF THE SPONTANEOUS DATA

Each code is preceded by # to separate it from the other text. The letters in the code appear in the following order: mode, situation, gender, L1. If some of the information is missing, there is 0 in the code at the appropriate location.

Mode:

o = oral (transcribed)
w = written (by the informant)

Situation:

i = interview or discussion with a Finnish teacher or researcher present, but with free choice of topics; in the case of writing: a free writing task of the student's choice of topic, even if the form of writing (e.g. letter) is given by the teacher

t = test situation: a picture description from the tapes of the National Certificate of Language Proficiency in Finnish, or a structured classroom exercise

Gender:

f = female
m = male

L1:

e = English
s = Swedish, Norwegian, Danish
r = Russian
g = German
f = French
v = Estonian
h = Hungarian
k = Greek
a = Arabic
p = Persian
P = Polish
j = Japanese
u = unknown
o = other

The code #wife, for instance, indicates that the example is taken from a sample of writing on a topic of the English speaking female informant's choice. Sometimes a number (#oife1, #oife2) has been added to indicate that two similar examples are not from the same person.

Finnish summary

KARTTA JA KÖYSI
SUOMEN NOMININTAIVUTUS OPPIMISKOHTEENA

Tutkimusongelma

Tässä työssä tarkastellaan suomen nominintaivutusjärjestelmää oppijan näkökulmasta. Tarkoituksena on esittää, kuinka oppijat taivuttavat nomineja, ja selvitellä taivutuksen oppimista sekä morfologisesta että psykolingvistisestä näkökulmasta.

Suomea pidetään vaikeasti opittavana kielenä. Tämä maine perustuu osin siihen, että suomi ei muistuta mitään suurista maailmankielistä. Ennen kaikkea taustalla kuitenkin on suomen kielen mutkikas taivutus, jossa monenlaiset pääteainekset yhdistyvät vaihteleviin vartaloihin. Taivutusmorfologia on valittu tutkimuksen kohteeksi juuri tästä syystä: se on keskeinen asia suomen kielen opintojen alkuvaiheessa ja se koetaan vaikeaksi. Kun suomi toisena kielenä -tutkimus on vasta syntyvaiheissaan, on tärkeää tutkia sitä, mikä on oppijoille ongelmallisinta.

Nominintaivutus on vain osa morfologiaa, ja siitäkin on tähän työhön rajattu ydinalue: sija- ja lukutaivutuksessa esiintyvät vartalonvaihtelut. Komparaatio ja possessiivitaivutus ovat mukana vain muutaman esimerkin kautta. Huomio kohdistetaan siihen, mikä on oleellisinta — tavallisiin sijamuotoihin. Poikkeukselliset vartalotyypit ja harvinaiset sijamuodot on jätetty syrjään. Myös oppimisen osalta tarkastelun kohteena on vain yksi lohko: työssä tarkastellaan pelkästään taivutusmuotojen tuottamista, ei lainkaan niiden ymmärtämistä.

Tutkimusmenetelmä on eklektinen. Aluksi esitellään valikoima käsitteitä ja selitysmalleja, joita psykolingvistiikassa ja morfologian tutkimuksessa on käytetty. Sen jälkeen kolmea erityyppistä aineistoa pyritään tarkastelemaan ja selittämään näiden käsitteiden ja mallien avulla. Saatujen tulosten pohjalta

pohditaan esitettyjen selitysmallien soveltuvuutta aikuisten oppijoiden suomen kielen taivutuksen kuvaukseen ja morfologian opettamiseen.

Psykolingvistinen käsitteistö

Lähes kaikessa kielentutkimuksessa luokitellaan tutkittavia ilmiöitä, vaikka **luokittelun** lähtökohtia ei aina esitetäkään. Myös oppijat luokittelevat — osin tietoisesti, osin tiedostamattaan — vastaanottamansa kielellisen aineksen, kukin omilla perusteillaan. Luokittelun perusteiden moninaisuuden tajuaminen on yksi oppimisen ymmärtämisen edellytys. Tässä työssä kategorioiden luonnetta ja erilaisia luokittelutapoja esitellään pääasiassa George Lakoffin työn pohjalta. Hänen näkemyksensä erityisesti muista kuin klassisista kategorioista auttavat ymmärtämään oppijoiden tuotoksia, joissa usein kategoriat ovat rajoiltaan epätarkkoja, sumeita ja limittäisiä.

Oppiminen edellyttää opittavan aineksen muistamista. Olennaisin **muistiin** liittyvä seikka tutkimusongelman kannalta on sanamuotojen edustuminen muistissa. Sanamuodot voidaan muistaa kokonaisuuksina tai ne voidaan varastoida perusmuotoina, joihin sovelletaan sääntöjä tai joista tuotetaan taivutusmuotoja mallisanojen avulla. On myös mahdollista, että vartalo-allomorfit ovat muistissa valmiina, mutta kokonaiset sanamuodot eivät. Näiden vaihtoehtojen todennäköisyyttä arvioidaan aineiston analyysin tulosten perusteella.

Tavallisesti ajatellaan, että oppijan kieli eroaa syntyperäisen puhujan kielestä, koska oppija tekee **virheitä**. Oppijan tuotos on kuitenkin monessa suhteessa syntyperäisen tuottaman kielen kaltaista. Natiivitkin tekevät virheitä, eikä yksittäisiä tuotoksia voi aina laadullisin kriteerein erottaa oppijan ilmaisuista. Silti oppijan virheet ovat tärkeää tutkimusaineistoa, koska virheettömästä tuotoksesta ei voi nähdä taustalla olevaa tuottamisprosessia, kun taas virhe saattaa paljastaa lähteensä. Erityisesti kielten välisen vaikutuksen selvittämisessä niillä on merkitystä.

Oppiminen voidaan nähdä joko tietoisena opettamisen ja opiskelun tuloksena tai tiedostamattomana omaksumisena. Tässä työssä on perus-oletuksena, että aikuisen toisen kielen oppimiseen liittyy sekä **deklaratiivista** että **proseduraalista tietoa**. Oppija tekee tietoisesti havaintoja ja saa opetuksessa tietoja opittavasta kielestä. Toisaalta hän omaksuu kieltä myös ympäristöstään eikä välttämättä pysty analysoimaan omaksumaansa, vaikka osaa käyttää sitä omassa puheessaan. Sekä deklaratiivinen että proseduraalinen tieto automaattistuvat käytössä kielitaidoksi.

Kielentutkijat ovat viime vuosina käyneet kiihkeää keskustelua siitä, perustuuko kielen prosessointi sääntöihin vai ei. Keskustelu sai alkunsa 1980-luvun loppupuolella esitetyistä konnektionistisista malleista, joissa prosessointi perustuu yksiköiden välisten yhteyksien vahvistumiseen tai heikkenemiseen. Vanhastaan on kiistelty sääntöjen ja analogian paremmuudesta kielellisten ilmiöiden selittäjänä. Näiden käsitteiden sisältö vaihtelee myös. Koska tässä työssä kohteena on oppiminen, kieliopillisen säännön psykologinen realistisuus on tärkeä ongelma. Taivutus**säännöt** käsitetään tässä työssä (tavallisesti yksisuuntaisiksi) prosesseiksi, joiden avulla perusmuodoista tuotetaan muita

muotoja. **Analogia** taas määritellään luovaksi prosessiksi, joka perustuu vertailtavien muotojen todelliseen tai oletettuun samankaltaisuuteen tai lähekkäisyyteen.

Morfologian mallit

Morfologiset mallit jaetaan tavallisesti kolmeen ryhmään, IP-, IA- ja WP-malleihin. Näistä sääntöihin perustuva IP-malli ja paradigmoihin nojautuva WP-malli ovat viime vuosikymmeninä kilpailleet johtoasemasta suomen kielen kuvauksessa. Morfologiaa on 1980-luvulta lähtien lähestytty myös uusista näkökulmista. Tällaisia ovat Joan Bybeen skeemoihin perustuva näkemys sekä konnektionistien ajatuksiin pohjautuvat kuvauskokeilut. Nämä mallit sisältävät osin samantyyppisiä ajatuksia, joita Heikki Paunonen esitti 1970-luvulla kenttämorfologiana tunnetussa mallissaan.

Tämän tutkimuksen hengen mukaisesti kaikkien mallien esittely pohjautuu siihen, että ulkomaalaisten suomenoppijoiden taivutusta voidaan lähestyä useamman kuin yhden mallin kautta. Mallien soveltamisen ongelmana on, että ne on laadittu syntyperäisen kielenpuhujan näkökulmasta. Oppijan tilanne on toisenlainen siksi, että hän ei etukäteen tiedä, mikä on perusmuoto tai miltä säännön tai paradigmaattisen mallin sovellustuloksen pitäisi näyttää. Hänellä ei myöskään ole samaa proseduraalista tietoa sanatyypeistä ja paradigmojen rajoista kuin suomalaisella. Näin ollen oppijan tuotoksia ei ole tarkastelussa jaettu perinteiseen tapaan sanatyyppeihin, vaan luokittelun perustana on sanaryhmän ilmeisin yhteinen piirre, esimerkiksi *s*-loppuisuus tai *e*- ja *i*-vokaalin esiintyminen vaihtelevasti eri muodoissa.[74]

Aineisto ja informantit

Taivutuksen oppimista on tässä työssä haluttu tarkastella mahdollisimman monesta näkökulmasta. Tämä on määrännyt tutkimusaineiston valinnan. Mukana on kolmenlaista aineistoa: (1) taivutustestin tulokset, (2) oppijoiden haastatteluja ja (3) oppijoiden spontaanisti tuottamaa puhetta ja kirjoitusta.

Taivutustestissä oppijoita (N = 35) ja suomalaista kontrolliryhmää (N = 25) pyydettiin taivuttamaan 30 nominia ja 30 näiden pareiksi keksittyä tekosanaa yksikön genetiivissä ja monikon partitiivissa. Tekosanat erosivat oikeista sanoista vain alkukirjaimen verran. Testisanat olivat aakkosjärjestyksessä alakkain ja taivutusmuodot kirjoitettiin niiden viereen. Testi järjestettiin kahden kesäkurssin yhteydessä.

Testin jälkeen 18 oppijaa haastateltiin. Heitä pyydettiin kertomaan siitä, miten he tavallisesti pyrkivät löytämään sanan taivutusmuodon, elleivät osaa sitä suoralta kädeltä tuottaa. Jotkut pystyivät kertomaan asiasta laajastikin, mutta useimmiten tarvittiin avuksi esimerkkisanoja ja -lauseita, joiden avulla

[74]Tutkimuksessa määritellään myös suomen kielen morfologian kuvauksen peruskäsitteitä ja selostetaan kokoavasti aineistossa esiintyviä vartalovaihteluita ja muita taivutusilmiöitä. Nämä oletetaan tutuiksi suomenkielisille lukijoille.

asiaa pohdiskeltiin. Keskustelut käytiin enimmäkseen suomeksi, mutta tarvittaessa käytettiin myös englantia ja pohjoismaisia kieliä.

Kolmas tutkimusmateriaalin lähde oli Suomen Akatemian Suomi toisena ja vieraana kielenä -tutkimushankkeen keräämä korpus, josta koottiin kaikki morfologisen virheen sisältävät ilmaukset. Korpuksessa on sekä nauhoitettua ja litteroitua puhetta että opiskelijoiden kirjoituksia.

Tutkimusaineistoa on kaiken kaikkiaan noin 60 eri informantilta. Kaikki ovat aloittaneet suomen kielen aktiivisen opiskelun ja käytön aikuisiässä, vaikka muutama on kuullut suomea jo lapsena sukulaisvierailuilla tai naapureiltaan. Jokainen on saanut kotimaassaan ainakin keskiasteen koulutuksen ja on siten opiskellut muitakin kieliä. Suomen kielen oppimistapa vaihteli melko paljon: osa oli oppinut suomea pääasiassa asumalla suomenkielisessä ympäristössä ja saanut vain vähän muodollista opetusta, osa taas oli opiskellut suomea pääasiassa kotimaassaan ja oleskellut Suomessa vain joitakin viikkoja.

Informanteiksi ei ole valittu vain yhden lähtökielen puhujia, sillä tutkimus kohdistuu taivutusjärjestelmän oppimisen kokonaiskuvaan. Sen hahmottamisessa eri äidinkieliä puhuvien oppijoiden tuottama materiaali on pikemminkin rikkaus kuin haitta. Mukana on myös sekä puheesta poimittua että kirjallisesti tuotettua aineistoa, koska kumpikin valaisee osaltaan taivuttamisen ongelmia.

Tulokset

(1) Irrallisten sanojen taivuttamistestin hypoteesit olivat seuraavat:

- Olemassa olevat sanat tuottavat enemmän oikeita vastauksia kuin tekosanat.
- Vastaavasti oikeita yksikön genetiivimuotoja tuotetaan enemmän kuin oikeita monikon partitiivimuotoja.
- Tekosanat tuottavat enemmän keskenään erilaisia vastauksia kuin todelliset sanat.
- Keskenään erilaisia monikon partitiiveja tuotetaan enemmän kuin yksikön genetiivejä.
- Sanat asettuvat vaikeusjärjestykseen morfofonologisen kompleksisuutensa perusteella.

Oikeita vastauksia koskevat hypoteesit osoittautuivat tosiksi tilastollisesti merkitsevällä tasolla: todellisista sanoista tuotettiin enemmän oikeita muotoja kuin tekosanoista ja oikeita yksikön genetiivimuotoja oli enemmän kuin oikeita monikon partitiivimuotoja. Sen sijaan keskenään erilaisia vastauksia koskevat tulokset eivät olleet yhtä yksiselitteisiä, sillä tilastollinen merkitsevyys riippui siitä, otettiinko huomioon kaikki erilaiset vastaukset vai vain ne, jotka vähintään kaksi koehenkilöä oli antanut.

Morfofonologinen kompleksisuus määriteltiin kahden muodon välisten foneemimuutosten määräksi. Jokainen foneemin poisto, lisäys tai vaihto laskettiin yhdeksi muutokseksi. Kun sanat asetettiin hypoteettiseen kompleksisuusjärjestykseen tällä perusteella, näin saadun listan ja oikeiden vastausten määrän perusteella muodostetun listan välinen korrelaatio oli 0.944. Vartalonmuutosten määrä selitti siis suuren osan sanojen vaikeusjärjestyksestä, mutta

myös sanojen tuttuus ja suuri frekvenssi vaikuttivat. Esimerkiksi sanat *poika* ja *nainen* tuottivat enemmän oikeita vastauksia kuin niiden morfofonologinen kompleksisuus olisi edellyttänyt. Myös erilaiset astevaihtelutapaukset asettuivat vaikeusjärjestykseen siten, että kvantitatiivinen astevaihtelu ja *t:d-* ja *p:v*-vaihtelu olivat helpompia kuin muut kvalitatiiviset vaihtelut. Käänteinen astevaihtelu ja *k*:n vaihtelu kadon kanssa olivat vaikeimpia.

Yksittäisten sanojen taivutustuloksien tarkastelu osoitti, että hyvin monenlaiset tekijät saattavat vaikuttaa taivutukseen. Tällainen on edellä mainittujen lisäksi sanan merkitys: ainesanoista ja niiden mallin mukaan muodostetuista tekosanoista tuotettiin monikon partitiivin sijaan yksikön partitiivimuotoja. Jos sanan ulkoinen hahmo muistuttaa sanatyyppiä, jossa esiintyy paljon vaihteluita, taivuttaminen on vaikeampaa, vaikka kyseisessä sanassa ei vaihteluita esiintyisikään. Edelleen kävi ilmi, että monikon partitiivissa -iA-loppuisuus voidaan nähdä oletusarvona, joka valitaan epävarmassa tilanteessa.

Erityisen kiinnostavia olivat kontrolliryhmän tulokset. Todelliset sanat osattiin taivuttaa jotakuinkin täydellisesti, mutta tekosanojen taivutuksessa oli yllättävääkin vaihtelua, ja osa muodoista oli sellaisia, jotka eivät ole minkään olemassa olevan paradigman tai morfofoneemisten sääntöjen mukaisia.

(2) Introspektioaineisto koottiin, koska lähtökohtana oli, että aikuisella kielenoppijalla on tietoa omasta oppimisestaan. Tämä oletus osoittautui todenmukaiseksi, sillä lähes kaikki haastateltavat pystyivät kertomaan oppimis- ja taivutusstrategioistaan.

Yleisistä oppimisstrategioista kertominen oli helpompaa kuin spesifeistä taivutusstrategioista keskusteleminen, mutta niitäkin useimmat kykenivät erottelemaan. Tavallisimmin mainittiin eksplisiittisten sääntöjen hyväksikäyttö, muotojen opetteleminen ulkoa sekä taivutusmallien käyttö.

Haastateltavien henkilökohtaiset erot tulivat haastatteluissa selvästi esille. Kahdella monipuolisimmin omaa taivutusstrategiaansa esitelleellä koehenkilöllä oli aivan erilainen kielenoppimistausta: toinen oli oppinut suomea asumalla Suomessa pari vuotta ja oli nyt ensimmäisellä kielikurssillaan, toinen taas oli opiskellut suomea kotimaansa yliopistossa ja oli ensimmäistä kertaa Suomessa. Muodollista opetusta saaneella haastateltavalla oli luonnollisesti käytettävissään kieliopillista terminologiaa, mutta suomea ympäristöstään omaksunut kykeni kuvaamaan omia strategioitaan yleiskielen avulla aivan yhtä tehokkaasti. Kielenoppimistausta ei siis välttämättä ole sidoksissa kykyyn kuvailla taivutusstrategiota.

Toinen mielenkiintoinen havainto oli se, että koehenkilöiden luottamus toisaalta opittuihin sääntöihin, toisaalta omaan "kielikorvaansa" vaihteli riippumatta siitä, miten kieltä oli opittu. Taivutusstrategiat ja kyky kuvata niitä ovat siis selvästi oppijakohtaisia muuttujia.

(3) Oppijoiden eri tilanteissa tuottamasta spontaanista puheesta ja kirjoitelmista koottiin kaikki ne ilmaukset, joihin sisältyi morfologinen virhe. Yksikkövartalon muodostusvirheet koskivat tavallisimmin astevaihtelua, *e-* tai *i*-vartaloisia ja *s-*

loppuisia sanoja. Monikkovartalon muodostusongelmat koskivat enimmäkseen *e*- tai *i*-loppuisia sekä *A*-loppuisia sanoja.

Vartalonmuodostusongelmien lisäksi ongelmia ilmeni pääteaineksen valinnassa ja järjestyksessä. Taivuttamatta jättäminen oli myös tavallista. Muutamia esimerkkejä esitetään myös oppijoiden ja heidän keskustelukumppaniensa vuorovaikutuksesta taivutusongelmien selvittämisessä.

Aineistossa esiintyviä ilmaisuja analysoitiin eri näkökulmista. Sääntöihin perustuvan kuvausmallin valossa virhe voitiin nähdä väärän perusmuodon tai säännön valitseminen tuloksena, tai säännön soveltamisen epäonnistumisena. Taivutusmallien kannalta taas virheellinen muoto saattoi olla seurausta väärän mallin soveltamisesta eli sanan sijoittamisesta väärään taivutustyyppiin tai sitten taivutusparadigmojen sekaantumisesta. Jos taas taivutus nähdään ulkoaopittuina muotosarjoina, virheet voivat olla seurausta muistin pettämisestä. Kognitiivisten prosessien kannalta kyse sattoi olla myös luokittelun ongelmista, analogisen prosessin epäonnistumisesta tai tuotoksen virheettömyyttä valvovan monitorin pettämisestä.

Nominintaivutukseen vaikuttavia tekijöitä

Tutkitun aineiston perusteella nominien taivutuksen onnistumiseen vaikuttavat seuraavat tekijät:

- sanan morfofonologinen kompleksisuus
- vaihteluiden erottuvuus
- sanan, muodon ja sanatyypin frekvenssi
- sanan tuttuus
- sanan merkitys
- muotojen lähekkäinen sijainti
- luokittelun helppous
- ongelmapotentiaali

Luettelon seikat eivät ole tärkeysjärjestyksessä, ja useat tekijät ovat sidoksissa toisiinsa. Yksittäisen tekijän erillistä vaikutusta ei tämän aineiston valossa ole mahdollista todistaa.

Morfofonologinen kompleksisuus (ks. määritelmää edellä) lisää — odotuksenmukaisesti — taivutusongelmia kaikkien käytettyjen aineistojen valossa. Vaihteluiden määrä ei kuitenkaan ole ainoa tekijä, vaan myös niiden laatu, selkeys ja eri muotojen erottuminen toisistaan vaikuttavat. Sanan ja muodon yleisyys edistävät oppimista, samoin sanan tuttuus oppijalle. Sanan merkitys vaikuttaa ainakin virheiden laatuun, esimerkiksi monikon muodostus aine- tai abstraktisanoista osoittautui vaikeammaksi kuin samanrakenteisista ja yhtä tutuista konkreettisista sanoista. Peräkkäiset sanat vaikuttivat toisiinsa siten, että muodot pyrkivät kopioitumaan joko eteenpäin tai taaksepäin sanatyypistä toiseen.

Edellä luetellut tekijät vaikuttavat lähinnä sana- tai ilmaustasolla. Kaksi viimeistä seikkaa ovat taivutusjärjestelmän luonteeseen liityviä tekijöitä. Jos sana on helposti luokiteltavissa tiettyyn sanatyyppiin kuuluvaksi, sen taivutus on

helpompaa kuin muilta ominaisuuksiltaan samanalaisen sanan, jota ei selvästi voi sijoittaa tiettyyn taivutustyyppiin. Samoin taivutukseltaan yksinkertainen sana voidaan taivuttaa väärin sen vuoksi, että se sisältää piirteitä, jotka oppija mielessään liittää monia vartalovaihteluita sisältävään sanaan — oppija ei ikään kuin usko, että taivutus voisi olla helppoa.

Oppijoiden nominintaivutus ja morfologiset mallit

Morfologisten mallien soveltuvuutta oppijoiden morfologian kuvaamiseen arvioidaan tässä työssä lähinnä vertaamalla sääntöihin ja taivutusmalleihin perustuvien kuvausten soveltuvuutta eri taivutusongelmien alueella. Säännöt sopivat luonnollisesti hyvin poikkeuksettomien ilmiöiden kuvaukseen, ja ne ovat siinä ekonominen ja toimiva ratkaisu. Sääntökuvausten ongelmana on usein se, että poikkeuksia on niin paljon, että oppijan sääntöjen soveltamiskyky ylittyy. Säännöt voivat olla myös hierarkkisia, mutta oppijoille laaditusta materiaalista tämä ei aina selviä, sillä esimerkiksi vartalonmuodostusta ja päätteiden valintaa koskevat säännöt esitetään lähes aina kahdessa eri paikassa. Säännöt ovat myös yleensä yksisuuntaisia, kun taas toisen kielen oppijat tarvitsevat myös tietoa, jonka avulla he voivat johtaa kuulemastaan muodosta perusmuodon.

Taivutusmalleihin perustuvat morfologiset kuvaukset tuottavat tavallisesti parempia tuloksia alueilla, jotka ovat sääntöjen osalta hyvin mutkikkaasti kuvattavissa: jos oppijalle antaa mallin, sen avulla tuotettu muoto on useammin oikein kuin mutkikkaiden sääntöjen avulla tuotettu. Taivutusmalleihin perustuvien kuvausten ongelmana taas on se, että analogisen prosessin rajoja on vaikea vetää.

Tutkimusaineiston tarkastelu osoitti, että kaikki tarkastellut morfologian kuvaustavat soveltuvat hyvin jonkin aineiston osan analyysiin, mutta mikään niistä ei ole oppimisen näkökulmasta käyttökelpoinen kaikkien taivutusilmiöiden kuvaukseen. Taivutusjärjestelmä ei ole tasalaatuinen alue, jonka kaikkia osia voitaisiin kuvata samalla tavalla, vaan erityyppisiä taivutusilmiöitä on kuvattava eri tavoin. Toisaalta voidaan myös kysyä, ovatko sääntöjen avulla tuottaminen ja analogian avulla tuottaminen todella perimmiltään eri asioita, vai onko kyse vain kahdesta tavasta kuvata samaa prosessia.

Aikuisen kielenoppijan taivutusjärjestelmä muotoutuu esiintymien perusteella. Voidaan kuvitella, että esiintymät laskeutuvat kuin lumihiutaleet taivaalta ja asettuvat eri kohdille morfologista maisemaa. Aluksi ne sijoittuvat sattumanvaraisesti, mutta vähitellen oppijan kognitiiviset prosessit (luokittelu, muisti, analogia) tai ekplisiittinen opetus alkavat järjestää niitä kasoihin. Usein esiintyvät ja selvästi muista erottuvat sanamuodot muodostavat jyrkkäreunaisia vuoria, harvinaiset muodot tai helposti muihin sekaantuvat muodot matalampia kohoumia, jotka eivät yhtä selkeästi erotu ympäristöstään. Lopulta kohokartta alkaa muistuttaa aikuisen suomenpuhujan karttaa, jonka avulla puhuja suunnistaa tarkasti ja harvoin osuu väärälle kukkulalle. Oppija tai lapsi lipsuu taas etenkin vähemmän jyrkkäreunaisille alueilla helposti väärän kukkulan puolelle. Samoin voi käydä afaatikolle, jonka maisema on on joutunut eroosion kohteeksi.

Oppijoiden nominintaivutus ja psykolingvistiset mallit

Kielen yksiköiden luokittelu ja edustuminen muistissa ovat psykolingvististen mallien keskeisiä käsitteitä. Luokittelun ongelmat näkyvät selvästi oppijoiden tuotoksissa: jos sana tai muoto ei ole selkeästi luokiteltavissa, sen tuottaminen on ongelmallista. Pyrkimys kaikkien tapausten poikkeuksettomaan luokitteluun lisää tarvittavien kategorioiden määrää, mikä kuormittaa oppijan muistia. Laaja-alaiset ja rajoiltaan epämääräiset kategoriat taas saattavat johtaa virheellisiin tuotoksiin etenkin reuna-alueilla.

Oppijoiden tuotosten voidaan tulkita tukevan mallia, jossa suomen kielen sanojen vartalot edustuvat muistissa allomorfeina (SAID-malli, Niemi, Laine & Tuominen 1994), joihin pääteainekset liitetään. Samoin oppijoiden tuotokset voidaan selittää konnektionistisen mallien avulla, joiden etuna on etenkin unohtamisen ja virheen syntyprosessin sisältyminen malleihin.

Psykolingvistiset mallit voivat pyrkiä sisäiseen yhtenäisyyteen ja universaaliuteen tai ne voivat sisältää useita erityyppisiä prosesseja ja olla kielikohtaisia. Tutkimuksen tulosten perusteella ei mikään nykyisistä sisäiseen yhtenäisyyteen ja yleispätevyyteen pyrkivistä malleista ei selitä kaikkia oppijoiden suomen kielen ilmiöitä. Parempaan selittävyyteen päästään malleilla, jotka olettavat useiden kognitiivisten prosessien rinnakkaisen käytön ja sallivat näiden prosessien erilaisen käyttösuhteen eri kielissä.

Psykolingvistisen mallien tarkastelua suomen kielen taivutuksen oppimisen kannalta vaikeuttaa se, että syntyperäistenkään suomen kielen puhujien morfologisista prosesseista ei ole riittävää tietoa. Tutkimuksessa osoitetaankin lukuisia ongelmia myöhemmän tutkimuksen selvitettäviksi.

Jos taivutusjärjestelmää voi kuvata karttana, oppimista voi verrata köyteen. Köyden alkusäikeinä ovat yleiset kognitiiviset prosessit, oppijan oma kieli ja kielenoppimistausta. Kun oppijan tieto ja kokemus suomen kielestä lisääntyy, köydestä tulee vähitellen pitempi ja tukevampi, ja se auttaa oppijaa yhä enemmän liikkumaan luottavaisesti morfologian vuoristoisessa maisemassa.

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