The Inter-Nordic Study of Language Acquisition

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The typological variation between the Nordic languages offers a "natural laboratory" for the cross-linguistic study of first language acquisition. Based on an on-going inter-Nordic project, the present article discusses research designs for the exploration of this laboratory together with pilot analyses of acquisition data across Danish, Finnish, Icelandic, Norwegian and Swedish. On the basis of evidence from longitudinal case studies, from narrative tasks, and from morphological and phonetic experiments, the project aims at producing an integrated picture of the development of grammatical morphology and its interaction with (a) the semantic domains of spatial and temporal relations and (b) the prosodic domains of tonal word accents and duration. In the present article the focus is on spatial relations and prosody. Comparisons of developmental data between languages that show considerable typological differences (Finnish vs Icelandic vs the Mainland Scandinavian languages) allow us to establish broad cross-linguistic commonalities in acquisition structure. It is shown that, across all five languages, very similar relational concepts are encoded by the first grammatical morphemes emerging in the field of spatial relations. The impact of linguistic details on acquisition structure can be explored with greater precision through comparisons between languages that show minimal typological differences (the internal differences between the Mainland Scandinavian languages: Danish vs Norwegian vs Swedish). Here, the early development of the Verb + particle construction in two Danish and two Swedish children is analysed. Language-specific effects on acquisition structure of syntactical and prosodic traits are demonstrated. Further, language-specific effects on the development of verb argument structure in spatial descriptions are discussed.

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1. THE NORDIC LANGUAGES AS A CROSS-LINGUISTIC LABORATORY

The past 15 to 20 years has seen an increase in the exploration of cross-linguistic approaches to the study of first language acquisition. Correspondingly, the scope of child language data has been significantly broadened (see, e.g., Slobin 1985b, 1992). These studies show that children growing up with very different languages share certain basic traits in the way they build up their early grammatical systems. There is cross-linguistic evidence for a "basic child grammar" (Slobin 1985a). This similarity in early language development can be explained – at least partly – with reference to our biological endowment and maturity related cognitive constraints. But there is also growing evidence of a considerable sensitivity in early child language development to details of the child's particular linguistic environment. Thus, for example, by six months of age infants show a preference for listening to vowels which are part of their language-specific perceptual experience over listening to vowels which are not part of that experience (see Kuhl et al. 1992, Kuhl 1993). Similarly, in the domain of semantics, there is evidence of an early sensitivity to language-specific details. For example, in their early vocabulary development, English and Korean children learn to make very different semantic distinctions for talking about location and direction, which are particular to their respective languages (Choi and Bowerman 1991).

The typological variation between the Nordic languages offers a "natural laboratory" for the cross-linguistic study of language acquisition (see further section 3). This laboratory is currently being explored in an inter-Nordic research project, "Language Development – a Scandinavian Perspective", in which aspects of first-language acquisition are studied across the Nordic languages Danish, Finnish, Icelandic, Norwegian and Swedish.[1] On the basis of evidence from longitudinal case studies, from narrative tasks, and from morphological and phonetic experiments, the project aims at producing an integrated picture of the development of grammatical morphology and its interaction with (a) the semantic domains of spatial and temporal relations and (b) the prosodic domains of tonal word accents and duration.

The present paper first gives an overview presentation of the project design and data sets and then reviews in greater detail pilot results from the domain of spatial relations. A brief description of experimental work in the domains of morphology and prosody is also given.

2. DESIGN AND DATA

The inter-Nordic project does not start from scratch. Rather, it is designed to supplement and extend relevant on-going research on language development in the five Nordic countries, so as to achieve a joint inter-Nordic research activity powerful enough to realize the aims stated in section 1 above.

Research groups. The component research groups of the project are for Danish the Århus group (coordinator: Kim Plunkett), for Finnish the Jyväskylä group (coordinator: Matti Leiwo) and the Turku group (coordinator: Jorma Toivainen), for Icelandic the Reykjavík group (coordinator: Hrafnhildur Ragnarsdóttir), for Norwegian the Oslo group (coordinator: Hanne Gram Simonsen), and for Swedish the Göteborg group (coordinator: Sven Strömqvist, also main project coordinator) and the Stockholm group (coordinator: Olle Engstrand).

Longitudinal case studies. Longitudinal case study materials collected in everyday situations in the home are available or under construction in all five Nordic countries. A goal is to make these materials – a Danish, an Icelandic, a Finnish, a Norwegian, and a Swedish corpus – accessible in CHILDES/CHAT format, an internationally widespread format for the exchange of computerized child language data (see MacWhinney & Snow 1990, MacWhinney 1991). Already at this point, users of Internet can access a large set of CHAT files from the Danish and Swedish child language corpora through anonymous ftp to poppy.psy.cmu.edu, where they are stored in the tar files "Danish.tar" and "Swedish.tar" under the directory "/noneng".

The Danish corpus consists of data collected from two Danish children, "Jens" and "Anne", from 12 to 72 months of age. There are approximately 60 data points (CHAT files) from each child, one every second week between 12 and 36 months and one per month after 36 months. The Swedish corpus consists of data collected from five children, three of whom have been transcribed so far, "Markus", "Harry", and "Anton". From each of these three children there are currently around 30 datapoints (CHAT files) from approximately 18 to 40 months. The Norwegian corpus consists of datapoints from three East Norwegian children, "Vera", "Nora" and "Tomas" (2, 6 and 8 datapoints, respectively) in the age range 24 to 49 months. Nora and Tomas are transcribed in a two-tiered CHAT format with one morphological and one phonetic tier. Subsets of the Danish, Swedish and Norwegian corpora, which were available as early as 1989, were explored in a study of the acquisition of Mainland Scandinavian by Plunkett and Strömqvist (1992), covering the age range of approximately 12 to 30 months. The Icelandic corpus contains longitudinal data from three Icelandic children, "Ari", "Birna" and "Dora", from 2 to 6 years of age. There are currently 64 datapoints in CHAT format: 33 from Ari (24 to 70 months), 16 from Birna (24 to 37 months) and 15 from Dora (30 to 46 months).

For Finnish, Toivainen has a detailed longitudinal data set from one child. The data, which cover the age range 1;6 to 2;3 and contain 38 datapoints, were collected by means of a time sampling technique (4 minutes per hour during one day once every week). The 38 datapoints are presently accessible as typewritten non-CHAT transcripts. Also, Toivainen has access to the Oulu child language corpus of 25 children covering – on a group level – the age range 1;0 to 4;4. On an individual level, the corpus is fairly heterogeneous from the point of view of data collection, ranging from 1 single datapoint from 1 of the children at one extreme to 25 datapoints from another child at the other extreme. The group median is 8 datapoints per child. Text windows (concordances) on terms for spatial and temporal relations have been constructed from the corpus and are accessible in a computerized form for all children up to 2;11.

Narrative data. Narrative data elicited by means of the same picture story are available in all five Nordic countries except Denmark. The picture book used is "Frog, Where are you?" (Mayer 1969), a 24-page booklet without words depicting the adventures of a little boy and his dog as they go out into the woods to search for a frog which has disappeared from the boy's room. There is a considerable database that has evolved built on the use of this book with children acquiring many different languages, allowing for interesting cross-linguistic comparisons (see Slobin 1991, Berman & Slobin 1994).

Norwegian frog stories have been collected by Lanza in the Oslo group. Lanza's project is a cross-sectional study examining bilingual (Norwegian, English) children's acquisition of grammatical morphology. Data from monolingual Norwegian peers are also collected for comparative purposes. Icelandic frog stories have been collected by Ragnarsdóttir. Narratives were elicited from 40 children, 10 from each of the following age groups: 3, 5, 7 and 9 years, and from a control group of 10 adults (see Ragnarsdóttir 1992). Finnish frog-story data have been collected by the Turku group: 90 frog stories (62 in a handwritten transcribed form) from 49 girls and 41 boys ranging from 2 to 12 years of age. Several of the children told the story under two conditions: in face-to-face interaction and in a telephone conversation. Swedish frog stories are available from an experimental study by the Göteborg group. The experiment was designed to elicit data for the contrastive analysis of narrative discourse in speech (video-taped) and writing (computer-logged). The subjects were all Swedish 9th graders, 15 girls and 15 boys between 14 and 15 years of age (cf. Strömqvist & Hellstrand 1994). Spoken frog stories from 11 Swedish 5-year-olds are also available.

Experimental data. The project also comprises data sets from morphological and phonetic experiments. On the morphology side, data sets have been elicited in an experiment with the formation of past tense morphology (see further section 5.1) in Icelandic and Norwegian children (see Ragnarsdóttir & Simonsen 1994). The elicitation phase of the experiment is now completed for both Icelandic and Norwegian children. For each language, approximately 30 children from each of the following

Table 1. Languages, researchers and data.

Language	Senior researcher	Data			
		Longitudinal case studies	Narrative data	Experimental data	
				Past tense	Phonetic
Danish	Plunkett	yes	no	no	no
Finnish	Leiwo	yes	no	no	yes
Finnish	Toivainen	yes	yes	no	no
Finnish Swedish	Sundman				
Icelandic	Ragnarsdóttir	yes	yes	yes	no
Norwegian	Simonsen	yes	no	yes	(yes)
Norwegian	Lanza	no	yes	no	no
Swedish	Strömqvist	yes	yes	no	yes
Swedish	Engstrand	no	no	no	yes

age groups participated in the study: 4 years to 4 years and 6 months; 6 years to 6 years and 6 months; 8 years to 8 years and 6 months.

On the phonetic side, experimental data are available from a current project led by Olle Engstrand and Karen Williams of the Stockholm group. Experimental studies are being carried out with Swedish children of five different age groups: 6, 12, 18, 24 and 30 months. The experiments are designed to trace early language-specific development of speech sounds on the basis of production data.

In Finland the Jyväskylä group has started a similar data collection activity. In the experimental design by the Jyväskylä group the same set of infants is followed longitudinally from 6 months onwards throughout the preschool period. At 6 months the children are subjected to a perception test (see, further, section 5 below). Further, the Jyväskylä group has started to collect video-recorded data from mother–child interactions in the children's homes.

Summary: languages, researchers, and data. Languages, senior researchers and data in the project are summarized in Table 1. The table shows that longitudinal case study materials are available in all five countries; that narrative data (frog stories) are available in four (Denmark is the exception); that past tense experiments have been carried out in Iceland and Norway; and that phonetic data are available or under way in Sweden and Finland (some data are also available on Norwegian).

Furthermore, plans have been made for the collection of data – narrative as well as longitudinal – from children acquiring Finnish Swedish. Our contact person for the supervision of these studies is

Marketta Sundman at Åbo Academy. It is hoped that some first analysis will be available on Finnish Swedish during the second project year.

3. A CROSS-LINGUISTIC PERSPECTIVE

As mentioned in section 1, the project is designed to explore the inter-Nordic linguistic variation as a "laboratory" for research on language development (see Plunkett & Strömqvist 1992, Peters & Strömqvist, in press, Peters, to appear). Some important typological characteristics of the Nordic languages are summarized in Table 2. The typological profiles are specified in terms of phonological properties (word level stress: fixed to initial position or variable; vowel length and consonant length: contrast between long and short in both stressed and unstressed position or in stressed position only; consonant gradation; tonal word accent contrast; phrasal stress on the particle in Verb + prt constructions) and grammatical properties (gender marking on nouns; case marking on nouns: genitive as the only overt marking or more full-fledged case systems; prepositions; and morphological marking of the definiteness/indefiniteness distinction).

As can be inferred from Table 2, the Nordic linguistic laboratory offers two main types of comparisons for the cross-linguistic study of language acquisition. First, comparisons of developmental data between languages that show considerable typological differences (Finnish vs Icelandic vs the Mainland Scandinavian languages) and, second, comparisons between languages that show minimal typological differences (internal differences between the Mainland Scandinavian languages: Danish vs Norwegian vs Swedish).

An example of a case of the first type of comparison in the project is the acquisition of grammatical morphemes for encoding spatial relations. By and large, Finnish offers case endings for this function, Swedish offers prepositions, and Icelandic requires both prepositions and case endings. Examples of research questions in relation to this situation are:

- Which are the spatial relations encoded by the first terms productively occurring in the children's production data? (E.g., IN and ON before BEHIND and IN-FRONT-OF?)
- Which are the types of linguistic items encoding spatial relations first to productively occur in the children's production data? (E.g., suffixes before prepositions?)

We will discuss this case in greater detail in section 4.1 below.

From a methodological point of view, the comparison of languages that differ considerably from one another can help us to establish broad cross-linguistic commonalities and refute gross over-generalizations of universalist claims. The comparison of languages that differ only mar-

Table 2. Some typological characteristics of the Nordic languages (after Peters & Strömqvist).

Language	Stress	Vowel length	Cons. length	Cons. grad.	Tonal accents	Stress on V pft	Genders for N	Cases for N	Prepositions	Def indef
				Typological characteristics						
Finnish	fixed: init	l/s ± str	l/s ± str	yes	no	–	none	yes	none	none
Icelandic	fixed: init	l/s + str		no	no	yes	3	yes	yes	N-CASE-DEF N-CASE
Danish	varies	l/s + str		no	no	yes	2	gen	yes	N-DEF art$_{\text{INDEF}}$ N
Finnish Swedish	varies	l/s + str		no	no	yes	2	gen	yes	N-DEF art$_{\text{INDEF}}$ N
Swedish	varies	l/s + str		no	yes	yes	2	gen	yes	N-DEF art$_{\text{INDEF}}$ N
Norwegian	varies	l/s + str		no	yes	no	2–3	gen	yes	N-DEF art$_{\text{INDEF}}$ N

ginally across broad and detailed dimensions offers a supplementary methodological approach. Given that two closely related languages share many properties within a given linguistic domain, but differ on just one or two dimensions, then the causes and ramifications of these differences can be more carefully explored, i.e., Are the differences due to frequency factors in the two languages concerned? Are they semantically governed? etc. Such questions are more likely to be open to careful experimental investigation when the two linguistic systems are very similar precisely because of the possibility of holding many of the variables in the investigation under better control (see Plunkett & Strömqvist (1992) for an extended argument).

An example of a case of the latter type of comparison is the acquisition of the construction VERB + PARTICLE. Here, the minimally different Mainland Scandinavian languages exhibit systematic differences in terms of syntactic and prosodic properties. We will discuss this case in greater detail in section 4.2 below.

4. SPATIAL RELATIONS

4.1. *Broad Cross-Linguistic Commonalities*

For all children, from whom there are data from the one-word stage in the project, the first linguistic term encoding a spatial relation is a deictic term meaning approximately 'that'. This finding is in accordance with previous cross-linguistic research on the very first phases of early child language acquisition (see, e.g., Slobin 1970, Clark 1978). In this context, however, we shall focus on *grammatical morphemes* encoding spatial relations, that is, prepositions, case endings, and certain adverbs which can (but need not) serve as verb particles specifying the spatial meaning lexically encoded by the verb. So far, pilot analyses have been carried out for Swedish, Danish, Finnish and Icelandic. We shall first review the evidence from the two Mainland Scandinavian languages and then turn to Finnish and Icelandic.

Within the project a full analysis of two of the four children in the Swedish longitudinal corpus has been carried out (Markus, 15;19–33;29 and Harry 18;20–35;06). The analysis[2] shows that the first six prepositions and adverbs/particles to emerge in Markus's production are *in* 'IN_{dir}' (from 21;07) *ut*, 'OUT_{dir}' and *upp*, 'UP_{dir}' (both from 22;14), and *i*, '$\text{IN}_{loc/dir}$', *på*, '$\text{ON}_{loc/dir}$' and *av*, 'OFF_{dir}' (all three from 22;25); and the first six to emerge in Harry's production are *i*, '$\text{IN}_{loc/dir}$', *upp*, 'UP_{dir}' and *in*, 'IN_{dir}' (from 24;16), *på*, '$\text{ON}_{loc/dir}$' (from 26;18), *med*, 'WITH_{concom}' (from 28;02), and *ner*, 'DOWN_{dir}' (from 28;23).

A very similar set of first prepositions and adverbs/particles is evidenced in the two Danish longitudinal case study materials (Anne 13;09–32;12 and Jens 12;02–32;05) (see Sinha et al. 1995). *op*, 'UP_{dir}' (from

13;01 in Anne and from 13;23 in Jens), *af*, 'OFF$_{dir}$' (from 16;00 in Anne and from 22;14 in Jens), *ned*, 'DOWN$_{dir}$' (from 16;16 in Anne and from 21;16 in Jens), *ud*, 'OUT$_{dir}$' (from 18;09 in Anne and from 22;14 in Jens), *på*, 'ON$_{loc/dir}$' (from 18;20 in Anne and from 23;15 in Jens), and *i*, 'IN$_{loc/dir}$' (from 23;18 in Anne and from 23;15 in Jens).

The five first spatial cases (case marking of nouns) to emerge in the 25 children in the Oulu sample from 1;0 to 2;11 are: Illative 'IN$_{dir}$' (group median: from 23 months), Adessive 'ON$_{loc}$' (group median: from 25 months), Inessive 'IN$_{loc}$' (group median: from 27 months), Allative 'ON$_{dir}$' (group median: from 27 months), Elative 'FROM$_{dir}$' (group median: from 29 months) (cf. Toivainen, 1980).

Analyses of the Icelandic corpus comprise the 16 data points from "Birna", covering the age range 24 to 37 months, and the first 11 data points from "Ari" 24 to 31 months. In the first few data points available from these two children, there is ample evidence of the productive usage of the prepositions *á* 'on' and *í* 'in' together with nouns inflected in the dative case to mark location or with nouns inflected in the accusative case to mark direction. Also, Birna and Ari are using *til* 'to' together with nouns inflected in the genitive case to mark direction. There are extremely few examples of the usage of a preposition only or of case-marking only, where both preposition and case-marking are required by the adult norm. Among the first adverbs/particles productively used by Birna and Ari are *inn*, 'IN$_{dir}$', *upp*, 'UP$_{dir}$', and *nið ur*, 'DOWN$_{dir}$'.

A valid generalization across the analyses of Swedish, Danish, Finnish and Icelandic, then, is that very similar relational concepts are encoded by the first grammatical morphemes emerging in the field of spatial relations. Notably, terms encoding direction emerge as early as – if not earlier than – terms encoding location. The findings are summarized in Table 3, where "$\vee$" stands for 'comes before in acquisition'.

To sum up, young Nordic children to a large extent use their early spatial morphology for talking about motion events (rather than spatial states).[3] This becomes even more evident upon closer inspection of the linguistic contexts in which the prepositions and case markings appear. In the Danish and Swedish case study materials, prepositions like *i* 'in' and *på* 'on', which are not inherently directional, are often used as particles together with motion verbs to describe motion events and changes of spatial state. An utterance from Markus 22;25 may serve as an illustration: *lägga i dom* 'put them in'.

The finding that talk about location does not precede talk about motion in development illustrates that ontogenetic structure need not parallel ontological structure or semantic complexity. Semantic complexity as modelled by componential approaches to word meaning has been used with some success to predict the structure of acquisition of

Table 3. Acquisition order of the first few grammatical morphemes encoding spatial relations.

Swedish		Danish		Finnish	Icelandic
Markus	Harry	Jens	Anne	Oulu sample	Birna and Ari
in 'IN$_{dir}$' ∨ *ut*, 'OUT$_{dir}$', *upp* 'UP$_{dir}$' ∨ *i* 'IN$_{loc/dir}$', *på* 'ON$_{loc/dir}$', *av* 'OFF$_{dir}$'	*in* 'IN$_{dir}$' *upp* 'UP$_{dir}$' *i* 'IN$_{loc/dir}$', ∨ *på* 'ON$_{loc/dir}$', ∨ *med* 'WITH$_{concom}$' ∨ *ner* 'DOWN$_{dir}$'	*op* 'UP$_{dir}$' ∨ *ned* 'DOWN$_{dir}$' ∨ *af* 'OFF$_{dir}$', *ud* 'OUT$_{dir}$' ∨ *i* 'IN$_{loc/dir}$', *på* 'ON$_{loc/dir}$'	*op* 'UP$_{dir}$' ∨ *af* 'OFF$_{dir}$' ∨ *ned* 'DOWN$_{dir}$' ∨ *ud* 'OUT$_{dir}$' ∨ *på* 'ON$_{loc/dir}$' ∨ *i* 'IN$_{loc/dir}$'	Illative 'IN$_{dir}$' ∨ Adessive 'ON$_{loc}$' ∨ Inessive 'IN$_{loc}$', Allative 'ON$_{dir}$' ∨ Elative 'FROM$_{dir}$'	*á* 'ON' +Ndative$_{loc}$ or +Naccusative$_{dir}$ *í* 'IN' +Ndative$_{loc}$ or +Naccusative$_{dir}$ *til* 'TO$_{dir}$' +Ngenitive$_{dir}$' *inn* 'IN$_{dir}$' *upp* 'UP$_{dir}$' *niður* 'DOWN$_{dir}$'

Table 4. Differences in the VERB + PARTICLE construction between the minimally different languages Swedish, Danish, and Norwegian.

Properties of PRT	Swedish	Danish	Norwegian
	ta **út** *det*	*ta det* **úd**	**tà** *det ut*
Prosodic prominence	+	+	−
Contiguity to V	+	−	−

certain semantic fields such as, for example, dimensional terms (*big* is acquired before *tall*, etc.) or possession verbs (*take* is acquired before *buy*, etc.) (see Clark & Clark 1977 for a discussion). Semantic complexity, however, is not an adequate basis for predictions about the acquisition structure observed in our inter-Nordic data, since the notion of motion presupposes that of location or place (see, e.g., Miller & Johnson-Laird 1976) and we would hence expect to talk about motion to come later in acquisition than talk about place or location. Rather, an explanation for our findings needs to make reference to perceptual processes and the child's ability to detect motion and change, as well as to discourse processes and the fact that language acquisition is situated in communicative interaction where people tend to focus on new information and things that happen rather than things that remain the same.

4.2. *The Impact of Linguistic Details*

The minimal variation between the mainland Scandinavian languages includes, for example, systematic differences in the syntax and prosody of the VERB + PARTICLE construction (see Strömqvist 1992). If we focus on transitive verb phrases where the object is a pronoun, we get the systematic differences between Swedish, Danish and Norwegian summarized in Table 4.

The prosodic aspect of the variation consists in the particle receiving phrasal stress in Swedish and Danish, e.g., *gå út*, whereas the stress is put on the verb in East Norwegian dialects, e.g., *gå̀ ut* (the children in the Norwegian corpus come from Oslo). The Norwegian variant further differs from the Swedish and Danish variants in that it has a grave word accent contour. It should also be observed that the stressed particle occurs in phrase final position in the Danish example (but not in the Swedish one). When the phrase constitutes the whole utterance or when it occurs towards the end of an utterance, the phrase final particle is subjected to the phonetic effect known as "final lengthening" (see Lindblom 1978), that is, it is prolonged, which means that it will be even more prosodically prominent than its Swedish counterpart.

Now, consider the following two, general principles: 1. If an element of the flow of speech is more prosodically prominent than its environment, it is easier to attend to (see further section 5.2). 2. Elements which are closely associated semantically should be placed closely together syntactically.

Both of these principles have an important explanatory value in psycholinguistic studies of the speech perception and production processes as well as in studies of the early acquisition process (see, e.g., Slobin 1985a, Peters & Strömqvist, in press). Thus, the earliest linguistic items to emerge in child language development tend to be prosodically prominent in the flow of speech directed to children; and constructions which violate the principle of syntactic contiguity between semantically closely associated elements tend to emerge in later phases of children's language development.

Within the framework of the cross-linguistic study of language acquisition the Mainland Scandinavian variation of the VERB + PARTICLE construction offers a test case for the impact on acquisition structure of the two principles (1 and 2) (see Strömqvist 1992). If we focus on the first principle, we predict (a) that the particle will be maximally easy to attend to in the Danish case, where it receives both stress and extra length. If we focus on the two principles (1 and 2) in combination and specify the learner's task as tying the particle to the verb, we predict (b) that Swedish will be maximally conducive to the learning task in that it offers both prosodic prominence and syntactic contiguity.

For the purpose of empirical testing, the syntactic distribution of the first six grammatical morphemes encoding spatial relations (see Table 3) in the two Danish case study materials (Jens and Anne) were compared with the corresponding distributions in the two Swedish case studies (Markus and Harry). (The corresponding Norwegian data remain to be analysed in the project.) The distributional analysis was made in terms of whether the grammatical morphemes occurred as one-word utterances or as elements of multi-word utterances and was made of the first 20 datapoints (CHAT files) available from each child/case study material. The results are shown in Tables 5–8.

The analysis of the two Swedish and the two Danish longitudinal case study materials shows that particles emerge much earlier in the development of the two Danish children (around 1 year of age) than in the development of the two Swedish children (around 2 years of age). This finding renders support to the first prediction (a).[4]

The analysis further shows that particles first emerge as one-word utterances in the Danish children (13–18 months of age). And when the Danish children begin to produce them in multi-word utterances, they tend to combine them with words other than verbs. In contrast, particles

Table 5. The distribution of adv/prt on one-word vs multi-word utterances in the Danish child Jens from 13;23 to 24;02.

Period	1-word utterances with spat adv/prt	Multi-word utterances with spat adv/prt
12;26	0	0
13;23–18;26	8[a]	0
19;14–22;14	11	7
22;28–24;02	0	31[b]

[a] the most frequent item being *op*.
[b] the most frequent item being *på*.

Table 6. The distribution of adv/prt on one-word vs multi-word utterances in the Danish child Anne from 13;01 to 18;20.

Period	1-word utterances with spat adv/prt	Multi-word utterances with spat adv/prt
13;01–18;20	49[a]	1
19;04–22;17	69	44
23;18–23;26	1	22[b]

[a] the most frequent item being *op*.
[b] the most frequent item being *på*.

Table 7. The distribution of adv/prt on one-word vs multi-word utterances in the Swedish child Markus from 15;19 to 27;28.

Period	1-word utterances with spat adv/prt	Multi-word utterances with spat adv/prt
15;19–20;05	0	0
21;07–22;25	0	18[a]
23;00–27;28	2	360[b]

[a] 12 (67%) of which occur immediately after a verb.
[b] 158 (44%) of which occur immediately after a verb.

Table 8. The distribution of adv/prt on one-word vs multi-word utterances in the Swedish child Harry from 18;20 to 32;27.

Period	1-word utterances with spat adv/prt	Multi-word utterances with spat adv/prt
18;20–23;18	0	0
24;16–32;27	0	181[a]

[a] 104 (57%) of which occur immediately after a verb. 100% of the tokens of *in* and *upp* occur immediately after a verb.

Table 9. Distribution of particles in the early input to Anne (Danish) and Markus (Swedish).

Child	Language	Period	Datapoints	Particles (tokens)	% Utterances with particles	% prt in final pos.
Anne	Danish	13;01–18;20	11	539	11.4%	15.8%
Markus	Swedish	15;19–18;10	3	51	9.0%	6.0%
		15;19–23;00	10	293	14.3%	7.1%

almost never occur as one-word utterances in the two Swedish children, and (initially) they are quite often combined with verbs.[5] These last two results render support to the second prediction.

The predictions (a) and (b) above rely on the assumptions that the minimal difference in the construction of VERB + PARTICLE between Danish and Swedish is reflected in the specific input to the children of the present study. We have just started to test this assumption and results are available for Anne (Danish) and Markus (Swedish). Table 9 shows the distribution of particles in the input to Anne and Markus in the early phase(s) of acquisition evidenced in the two case studies. The table summarizes the number of datapoints analysed for each child, the number of particles found in the input utterances, the percentage of input utterances that contains a particle, and the percentage of particles that occurs in exactly utterance final position.

Table 9 shows that:

- for the Danish and Swedish case studies the proportions of input utterances that contain particles are very similar, and that
- there is a higher proportion of particles precisely in utterance final position in the Danish input

This last observation thus renders support to the assumption that the minimal syntactical difference between Danish and Swedish is reflected in the specific input to the children already at an early stage of acquisition.

4.3. *Argument Structure – a Typological Profile*

We observed in subsection 4.1 that young Nordic children to a large extent use their early spatial morphology for talking about motion events. In this subsection we mainly explore data elicited in the narrative (frog story) task. We restrict the analysis to the description of a motion event, "the fall from the cliff". In his search for the frog, the little boy (the main character of the frog story) experiences various adventures in the woods. At one point he is carried off on the antlers of a deer; the deer makes a sudden halt at the edge of a cliff, and the boy (and his

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Table 10. Ground argument profiles for Swedish, Icelandic and Finnish in descriptions of a motion event.

Language	Sentences describing boy's fall from the cliff constructed with			N sentences	N subjects
	0 g a[a]	1 g a	2 g a		
Swedish	45%[b]	53%	2%	49	41
Finnish	29%	64%	7%	75	42
Icelandic	22%	74%	4%	50	46

[a] "ga" reads 'ground argument' (source = cliff, goal = water).
[b] of N sentences.

dog) fall down into a pond at the bottom of the cliff. Our analysis is concerned with the linguistic descriptions of this fall taken from oral frog stories by 41 Swedish, 46 Icelandic, and 42 Finnish subjects. The Swedish-speaking subjects range from 5 to 15 years of age, the Icelandic-speaking subjects range from 3 to 9 years of age plus a group of 10 adult controls, and the Finnish-speaking subjects range from 3 to 9 years of age.[6]

Conceptual frameworks for analysing language for spatial relations and motion events have been proposed in the area of semantics and cognitive linguistics (e.g., Miller & Johnson-Laird 1976, Talmy 1983, Langacker 1987). Thus, in Langacker's terminology, the falling boy is the "trajector" and the (edge of the) cliff and the pond are the "landmarks". The trajector/landmark distinction is a special case of the figure/ground distinction, and we will here use the term "figure argument" (f a) for a noun phrase referring to the boy, and "ground argument" (g a) for a noun phrase referring to the cliff or pond.

An analysis of all sentences in the Swedish, Finnish and Icelandic frog stories, describing the fall from the cliff, shows that the figure argument (the boy) is always articulated. In contrast, the extent to which the ground arguments (cliff and/or pond) are articulated is subject to considerable variation. Some subjects construct sentences with 0 g a (*The boy fell* or *The boy fell down*), others with 1 g a (*The boy fell (down) into the water* or *The boy fell (down) from the cliff*), and still others with 2 g a (*The boy fell from off the cliff (down) into the water*). This variation is summarized in Table 10.

Although constructions with 0, 1 and 2 ground arguments are found in sentences by subjects from all three languages and although descriptive grammars of Swedish, Icelandic and Finnish ascertain that these constructions are all well-formed in the respective languages, we find a pronounced difference in the extent to which subjects with different

Table 11. Grammatical constructions used by Swedish, Icelandic and Finnish subjects in descriptions of a motion event.

Language	Sentences describing boy's fall from the cliff constructed with				N sentences
	V only	V + prt/adv	V + prt/adv + (prep) + NP (case)	V + (prep) + NP (case)	
Swedish	4%	41%	53%	0%	49
Finnish	9%	20%	23%	41%	75
Icelandic	8%	14%	22%	52%	50

languages seem to prefer the different constructions. More specifically, we find (1) that sentences with 2 g a are very rare across all three languages, (2) that Icelandic and Finnish subjects construct sentences with 1 g a to a greater extent than do Swedish subjects, and (3) that Swedish subjects construct sentences with 0 g a to a greater extent than Finnish or Icelandic subjects.

In short, then, there seems to be a tendential asymmetry in terms of proportions of 0 versus 1 ground argument between Swedish, on the one hand, and Icelandic and Finnish, on the other. Is it possible to find an explanation for this asymmetry with reference to the grammatical properties of the three languages? Let us look at the way the subjects constructed their sentences from a grammatical point of view. This is summarized in Table 11.

Table 11 shows (1) that constructions with V only are rare across all subjects (also, constructions including both an NP referring to the cliff and an NP referring to the pond are very rare), (2) that constructions with particle/adverb are by far the most frequent in the Swedish subjects (and infrequent in Icelandic and Finnish subjects), and (3) that constructions without particle/adverb are by far the more frequent in the Icelandic and Finnish subjects than in the Swedish subjects.

Table 11 thus exhibits an asymmetry which is parallel to that of Table 10 and is thus indicative of an explanation for the ground argument asymmetry originally observed. Subjects from the two languages which require either case marking only (Finnish) or both prepositions and case marking (Icelandic) are less inclined to make use of particles/adverbs to semantically specify the verb for direction, whereas the subjects from the language without case marking (Swedish) show a strong preference for the Verb particle construction. If case marking is used to specify direction – as in Finnish (without prepositions) or Icelandic (together with prepositions) – an NP has to be articulated in order for the case marking to apply, and that NP is in the present context always a ground argument. In contrast, if the Verb particle construction is used, no further NP is required and no ground argument has to be articulated. For Icelandic the situation is a bit more complicated than for Finnish, and needs some further qualification. First, the fact that Icelandic requires both prepositions and case marking puts, as it were, a double pressure on the articulation of an NP (a preposition requires an NP and case marking requires an NP). And the Icelandic subjects do indeed construct a greater proportion of sentences with one ground argument than the Finnish subjects. Second, the great majority of the prepositions used by the Icelandic subjects are compounds, where the first constituent is an adverb (e.g., *ofaní*[$_{prep}$above-into]) contributing substantially to the semantics of the description of the trajectory. Thus, there is a difference between the Swedish and the Icelandic subjects such that the former prefer to make spatial adverbs into verb particles, whereas the latter combine spatial adverbs with prepositions to make compound and semantically more complex prepositions. A consequence of the latter strategy, however, on which our argument crucially depends, is that an NP has to be articulated. "Typical examples" from Swedish, Finnish and Icelandic are rendered in examples 1–3.

(1) [Swedish, 5 years]
picture **description**
cliff *pojken ramla ner*
'the boy fell down'

(2) [Finnish, 4 years]
picture **description**
cliff *ja poika lensi vete-en*
'and boy flew water-ILLAT$_{dir}$'

(3) [Icelandic, 6 years]
picture **description**
cliff *og datt hundurinn og strákurinn ofaní sjó*
'and fell dog and boy [$_{prep}$above-into] sea:ACC$_{dir}$'

The analysis of ground argument structure sketched above offers a typological profile for the Nordic languages. This profile reflects a difference between the languages, not in terms of the presence or absence of certain grammatical traits, but in terms of preferences for grammatical means available for talking about motion events.

There are no clear developmental trends in the Finnish material, but the Icelandic and the Swedish data show a similar overall tendency: the language-specific effects are greater in the youngest age groups (Icelandic and Swedish 5-year-olds) than in the oldest (Icelandic adult controls and Swedish 15-year-olds). The differences are summarized in Table 12.

Are the distributional differences between Icelandic and Swedish found in the narrative data also manifest in the spontaneous data from

Table 12. Ground argument profiles for Swedish and Icelandic in descriptions of a motion event: youngest and oldest age groups.

Language	Age groups	Sentences describing boy's fall from the cliff constructed with 0 g a	1 g a	2 g a	N sentences	N subjects
Swedish	5 years	62%	38%	0%	13	11
	15 years	39%	58%	3%	36	30
Icelandic	5 years	10%	90%	0%	11	10
	adults	28%	58%	14%	10	8

Table 13. The distribution of prt/adv and PP with the top 10 spatial verbs in an Icelandic and in a Swedish case study.

Language	Subject	Age	Prod/input	V_{spat} only	V_{spat} + art/adv	V_{spat} + PP	N verb contexts
Swedish	Markus	24–26 ms	prod	38%	54%	8%	190
			input	32%	52%	16%	133
Icelandic	Ari	24–26 ms	prod	66%	10%	24%	122
			input	48%	18%	34%	380

the longitudinal case studies? An analysis of the contexts of the 10 most frequent spatial verbs in age-matched longitudinal data across Icelandic ("Ari" 24–26 months) and Swedish ("Markus" 24–26 months) shows that in the Icelandic data prepositional phrases are more common than adverbs or particles as semantic specifications of location or direction and, conversely, that adverbs and particles are more common than prepositional phrases in the Swedish data. This effect is slightly more pronounced in the children's production data than in their input (see Table 13). A tentative conclusion, then, is that the difference between Icelandic and Swedish is manifest across both longitudinal case study data and data elicited in the narrative task. Also, it is manifest across the children's production data and their input data.

5. OTHER PERSPECTIVES

The analyses so far made in the domain of grammatical morphology and spatial relations illustrate the usage of longitudinal case study materials and of narrative tasks in our project. A third type of data come from proper experiments. In this section we briefly review first an experiment with past tense morphology (section 5.1) and then perception and imitation experiments directed towards prosodic traits (section 5.2).

5.1. *Past Tense Morphology*

The past tense experiment is designed to explore how factors such as type frequency, token frequency, phonological coherence and phonological distance affect children's structure of acquisition of the morphologically complex area of past tense formation. This psycholinguistic problem solving space in acquisition has been much discussed in cognitive science over the past 10 years and subjected to extensive experimentation in connectionist approaches to language acquisition. The present experiment with real children departs from a theoretical perspective derived from the connectionist/competition model (see, e.g., MacWhinney & Bates 1989, Plunkett & Marchman 1991). In the experiment, which has been designed by Ragnarsdóttir & Simonsen (1994), past tense contexts are used as elicitation material and the children are asked to supply a verb form. In the Norwegian and Icelandic past tense test, each child was tested on approximately 60 verbs: 30 weak (past tense formation by syllabic suffix) and 30 strong ones.

Here, we briefly mention the predictions related to type frequency (the number of verbs in the total verb lexicon of the language in question that are associated with a given process for past tense formation) and token frequency (the number of times a given type is instantiated).

1. Predictions related to type frequency:
   (a) high type frequency verbs are acquired before low type frequency verbs
   (b) high type frequency verbs may form bases for (over)-generalizations
   (c) high type frequency strong verbs are less likely to be subjected to overgeneralization than low type frequency verbs
2. Predictions related to token frequency:
   (a) high token frequency verbs are acquired before low token frequency verbs
   (b) high token frequency verbs are more resistant to overgeneralizations than low token frequency verbs

In addition, the cross-linguistic prediction is made that Icelandic children will have more difficulties in learning the past tense formation than Norwegian children, because of the generally more complex morphology of Icelandic.

Preliminary observations of the elicited past tense data include:

- There are clear differences between the three age groups (4, 6, 8 years), with successively lower error proportions from the youngest to the oldest group. In the youngest age group the error percentages are higher for the Icelandic children than for the Norwegian children.

- Furthermore, there are clear differences between the types of errors in the different age groups: the 4-year-olds overgeneralize the weak (regular) verbs, whereas the 6-year-olds also overgeneralize the strong (irregular) ones.

5.2. *Prosody*

Prosody is an important aspect of continuity in development from perceptual and motor preferences during the child's first year of life to the acquisition of words and grammatical structures towards the end of the second year. Peters & Strömqvist (in press) propose a hypothesis along these lines, focusing on the role of prosody in the acquisition of grammatical morphemes. Their "Spotlight Hypothesis" reads:

> Perceptually salient prosodic patterns, including pitch contours, rhythm, and increased duration, may serve as "spotlights" on any phonological forms that are regularly associated with these patterns; if such forms happen to be grammatical morphemes, learners will focus on them earlier than on morphemes not so spotlighted. (Peters & Strömqvist, in press)

A case in point for the Spotlight Hypothesis is the additional prosodic prominence items like *i* 'in' and *på* 'on' acquire when they occur as particles with phrasal stress in Swedish or Danish (e.g., *lägga I* 'put in' *ta PÅ* 'put on')[7] as opposed to when they occur as non-stressed heads of prepositional phrases (e.g., *i BURKEN* 'in the jar', *på BORDET* 'on the table'). In section 4.2 we reviewed evidence from children's production data suggesting that the more prosodically prominent the particle the earlier it tends to be acquired (ceteris paribus). But how do the children under study approach the prosodically non-prominent occurrences of *i* and *på*, etc. in the context of prepositional phrases? A preliminary observation of the data from Harry (Swedish) shows that he develops a phonologically underspecified, un-stressed form, a schwa ("*ə*"), which he uses as a generalized prepositional device (cf. Peters & Menn, in press). For example, he would say *ə bordet* where the adult gloss would have been *på bordet* 'on the table'. Schwa, however, does not seem to be used as an approximation of verb particles, in the sense that it does not occur in contexts where a particle would have been appropriate from an adult point of view. The following utterance by Harry at 31;23 provides an illustration: *han klättra upp ə bordet* 'he climbed up *ə* (on?!) the table'. More research on these kinds of developmental strategy will be undertaken in the project.

Another case in point is tonal word accent contours. Peters & Strömqvist argue that the grave accent (the marked member of the Swedish tonal word accent distinction), especially the high pitch on the post-stress syllable, may serve as a spotlight on inflectional morphemes for children acquiring Swedish. This hypothesis is also in accordance with Engstrand et al. (1991), who, on the basis of an experimental study of children's early production data, argue that Swedish children begin to master the phonetic aspects of the Swedish grave accent, especially the high pitch on the post-stress syllable, at as early as around 17 months of age (that is, well before they start acquiring inflectional morphology).

Again, the minimal internal variation within the typologically homogeneous group of Mainland Scandinavian languages offers a natural laboratory for testing the Spotlight Hypothesis as applied to the grave accent. The "experiment languages" would be Norwegian and standard Swedish, both languages which have tonal word-accent distinctions which interact with lexicon and morphology. The "control language" would be Finnish Swedish, a regional variant of Swedish, of interest because it lacks tonal word accents, even though its lexicon and morphology are extremely close to those of standard Swedish. If the grave word accent really spotlights certain word-final inflections such as plural or past-tense, then we would expect standard Swedish learners to acquire these inflections earlier than Finnish Swedish learners.

For Finnish, in contrast, we would expect marked duration (vowel or consonant length) – rather than pitch contours – to serve as a spotlight on syllables encoding inflectional categories.

How early do Swedish and Finnish infants begin to discriminate in perception or to control in production the prosodic traits that will later play a role in their lexical and grammatical development? To explore that question, a perception experiment is carried out in the "baby lab" in Jyväskylä (Lyytinen and Leiwo) with a large group of 6-month-olds. In the experiment, the stimulus pair *ata* vs *atta* (nonsense words) is used to explore whether the infants discriminate a difference in duration between the two voiceless consonant segments – a difference typical of Finnish. The perception experiment follows a so-called habituation paradigm (head turning technique) (see, e.g., Eimas et al. 1992, Kuhl & Meltzoff 1982, Kuhl et al. 1992). Some of the infants will then be followed longitudinally up to (at least) 30 months of age, that is, long enough to analyse how they make use of their early language-specific phonetic preferences when they approach the task of acquiring lexical items and morphological patterns.

In the Stockholm laboratory (Engstrand and associates), production data have been elicited from Swedish children of different age groups from 6 to 30 months. The experiments are designed to trace early language-specific development of speech sounds and include listening experiments where adult subjects are asked to identify the presence of, for example, tonal word accent characteristics.

In order to increase the comparability of the Swedish and Finnish data in the domain of early prosodic development, an imitation experiment is planned for age-matched groups of Swedish and Finnish children. The imitation experiment is designed to explore the emergence of language-specific traits in early production (cf., e.g., de Boysson-Bardies & Vihman 1991, Engstrand et al. 1991) and will be administered to children of 17 to 18 months of age. The stimulus data for the experiment will be the nonsense words *ata* vs *atta* vs *àtta* (where ` indicates the marked member (grave) of the Swedish tonal word accent distinction). The predictions are:

1. Finnish children will perform better than Swedish children on the distinction *ata* vs *atta* (duration).
2. Swedish children will perform better than Finnish children on the distinction *atta* vs *àtta* (pitch contour).

The domain of the tonal word accent distinctions and its interaction with inflectional morphology in acquisition can be further studied in great linguistic detail within the project by comparing the minimally contrasting languages Swedish and Norwegian. For a subclass of the regular verbs in Swedish, the infinitive takes the grave accent (marked), whereas the present tense form takes the acute accent (unmarked). All regular verbs in Swedish end in *-a* in the infinitive and an example would thus be *sìtta* 'sit:INF' vs *sítt-er* 'sit-PRES'. In Norwegian, by contrast, verbs end in *-e* in the infinitive, and the corresponding example is *sìtte* 'sit:INF' vs *sítt-er* 'sit-PRES'. Since the word final *r* is often unstable for phonological reasons, the present tense form in phonetically realized as *sítte* (see Simonsen 1986). In effect, the tonal word accent becomes the only distinctive feature between the infinitive and present tense verb forms in Norwegian, whereas it is a redundant feature in Swedish. What is the impact of this minimal difference between Norwegian and Swedish on acquisition structure? Simonsen (1986) observes distinctive/minimal pairs of the type *sítte – sìtte* in her data from the Norwegian boy Tomas (2;0–2;2). Corresponding minimal pairs in the Swedish longitudinal data have not yet been discovered.

6. CONCLUDING REMARKS

The project design presented in this article offers a cross-linguistic window on the process of first-language acquisition. The design also offers a truly broad time window on the acquisition process, with perceptual and motor preferences in infancy at one end and narrative skills in adolescence at the other. The time window provides a potential for bridging two research gaps: the first between phonetic development in infancy on the one hand and early grammatical development on the other; the second between language development in the pre-school age and the school age.

The analyses of the interaction between grammatical morphemes, spatial relations and prosody presented in section 4 provide an illustration of the usefulness of the Nordic linguistic setting as a natural laboratory for the cross-linguistic study of language acquisition. The finding that very similar relational concepts are encoded by the first handful of grammatical morphemes in language acquisition across all five Nordic languages is interesting in view of the typological diversity of the five languages. And the finding that there were consistent differences between the respective ways in which the two Danish and the two Swedish children developed the Verb + participle construction indicates that language-specific details (in this case syntactic and prosodic details) can have an impact on early acquisition structure.

Also, the analyses presented in section 4 provide an illustration of the potential of the broad time scope. Again, the developmental analyses of the Verb + particle construction indicates that perceptually driven processes (attending to elements in the input which have extra stress or duration) in early phases of development can have consequences for the structure of the child's later construction of grammar. And the finding that the language-specific effects on the usage of Verb + particle versus Verb + PP in descriptions of spatial scenarios across Icelandic and Swedish data tend to decrease from the youngest to the oldest age-groups supports the notion that children can exaggerate the profile typical of their individual language (as reflected in their input) in early stages of development and that this profile can get less pronounced in later stages.

In combination, our analyses in section 4 support the generalization that those linguistic traits of the input that are salient from a perceptual and information processing point of view (by virtue of prosodic prominence, high frequency, etc.) filter through into the child's process of constructing a language, irrespective of whether the traits are cross-linguistically valid or typical of an individual language. In the latter case, they give rise to a language-particular profile of the child's early grammatical development. This distinctive profile can later level out as the learner broadens his linguistic repertoire and can lift the restrictions on his early expressive capacity.

Finally, we hope that the results emerging from the project, as well as the wide range of data on first-language acquisition that will be made available through the project, will be useful as a reference point also to students of second-language acquisition and deviant acquisition.

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NOTES

1 The project, which is supported by NOS-H (Nordiska Samarbetsnämnden för Humanistisk Forskning), started in January 1994 and is scheduled to run for three years.

2 For the purpose of illustration, a detailed account of the distribution of candidates for spatial prepositions and adverbs/particles over the 28 datapoints from Markus 15;19–33;29 is given in Appendix A. The candidate items in Appendix A were identified on the basis of context windows/concordances derived by the kwal program of the CLAN software package (see MacWhinney 1991). The data underlying the analyses of the Danish, Finnish and Icelandic case study materials were derived by similar methods.

3 This generalization has to be modified a bit in relation to the Icelandic data. The Icelandic children – as evidenced in the case study materials analysed so far – use their early spatial morphology for talking about motion events *at least as much* as for talking about spatial states.

4 An additional factor which probably contributes to the precocious emergence of particles in the Danish children is recency: since the particle occurs in phrase final position in Danish, it is subjected to the so-called recency effect, which makes it easier to remember elements occurring at the end of linear structures (see, e.g., Wingfield & Byrnes 1981).

5 During a first phase, 67% of the particles used by Markus occur immediately after a verb (see Table 7). In Harry, the distribution of particles in contexts with verbs is more governed by the particular morphemes: 100% of the tokens of *in* 'IN_{dir}' and *upp* 'UP_{dir}' occur immediately after a verb, whereas only 15% of the tokens of *i* '$\text{IN}_{loc/dir}$' occur with a verb.

6 More precisely, the Swedish subjects relate to two age groups: 11 5-year-olds and 30 15-year-olds; the Icelandic subjects relate to 5 age groups: 9 3-, 10 5-, 9 7-, 10 9-year-olds and 8 adult controls; and the Finnish subjects relate to 7 age groups: 5 3-, 6 4-, 5 5-, 7 6-, 9 7-, 5 8-, and 5 9-year-olds.

7 Upper case indicates prosodic spotlight.

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APPENDIX A. PREPOSITIONS AND ADVERBS/PARTICLES IN MARKUS 15;19–33;29

Appendix A shows the distribution of candidates for spatial prepositions and adverbs/particles over the 28 datapoints from Markus 15;19–33;29. Figures within parentheses indicate the number of particles occurring immediately after a verb. For example, "2(1)" reads 'out of a total of 2 occurrences 1 came immediately after a verb'.

PREPS.	15.19	16.27	18.10	19.25	20.05	21.03	21.07	22.14	22.25	23.00	23.12	23.25	24.09	24.16
inuti								2						
i									2(1)	5(4)	25(5)	5	10	19(4)
på									3	9(7)	7	10	14	18
av									2(2)				4(4)	4(4)
till									-		3		2	
med												1(1)		
igenom														1
framåt														
från														
ovanpå														
uppåt														
ur														
för														
under														
mellan														
ifrån														
efter														
bredvid														
genom														
åt														
vid														
bakom														
över														
utan														
neråt														

ADVERBS	15.19	16.27	18.10	19.25	20.05	21.03	21.07	22.14	22.25	23.00	23.12	23.25	24.09	24.16
där	7	20	5	3	13	6	1	10	5	20	28	12	14(1)	27
borta					1									1
in							2	1			1			
fast								1						1(1)
inne								1						1
ut								1(1)	5(5)			3(3)		5(5)
upp								5(3)	2(2)		1(1)	1(1)	1(1)	5(5)
bort									1(1)				10(10)	
fram										1(1)			2(1)	
hit										5(5)	3(3)			
ner										3(1)	2(2)		8(8)	8(4)
här										2		2	11	1
runt											1(1)			1
nånstans													3	
uppe														1
däråt														
nere														
därbak														
därunder														
tillbaks														
kvar														
dit														
härifrån														
ute														

24.25	26.05	26.10	26.17	27.09	27.28	28.09	28.18	30.20	30.25	31.24	32.02	32.08	33.29	PREPS.
														inuti
13	8	5	11(1)	8	1	7	10	6	3	3	12	34(3)	34(3)	i
20(9)	15(6)	4(1)	10(3)	13	9	6(4)	18(1)	3(1)	15	1	11	14(1)	14(1)	på
	1(1)	1(1)		2(2)		3(3)	1					11(11)	11(11)	av
2	1		4	9	2	2	1			6	1	2	2	till
	11(11)									1				med
														igenom
														framåt
	1		1											från
	1			1										ovanpå
	4													uppåt
	3			1							1			ur
		1									1			för
		1	1		2	1	2					9	9	under
				1										mellan
				1			2(2)							ifrån
					3(3)									efter
						2								bredvid
							1							genom
										14				åt
											1			vid
												1	1	bakom
												6(1)	6(1)	över
												1	1	utan
							1					1	1	neråt

24.25	26.05	26.10	26.17	27.09	27.28	28.09	28.18	30.20	30.25	31.24	32.02	32.08	33.29	ADVERBS
15	60	65	23	48	53	10	55	19	6	4	5		34	där
														borta
	3(3)	12(12)	2(2)		3(2)					3			3	in
	1(1)		1(1)			2(2)							11(11)	fast
	2	2												inne
	1(1)	2(2)	7(7)		2(2)		1(1)	4(3)			5(5)		1	ut
1(1)	1(1)	7(5)	15(15)	3(3)	13(8)		1	10(9)	2(2)			5(5)	3(3)	upp
	1	1(1)			3								1(1)	bort
														fram
		1(1)						2(2)						hit
	4(4)	8(6)	4(4)		5(2)	1(1)	2(2)	4(4)		3(3)	4(4)	3(2)	2(1)	ner
	2		4	2	2	10	1	10	2	1	6		36	här
														runt
														nånstans
	6	6	1		2	1		3						uppe
	1													däråt
	2	1	5				1	1						nere
					2									därbak
					1									därunder
					1(1)									tillbaks
							1							kvar
								1(1)						dit
														härifrån
													2	ute