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Acquisition of compounds in Lithuanian

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This study analyzes longitudinal data of two Lithuanian children, a boy and a girl, with the aim of investigating children's ability to produce compounds. In contrast to such languages as German or English, Lithuanian does not show a marked preference for noun-compounding. It is not surprising, then, that in the analyzed child language data compounds appear quite rarely, although in Lithuanian compounding is a productive pattern of word formation. The analysis of the data shows that compounds emerge quite early as pure imitations of adult utterances; however, even in later stages of language acquisition, when used spontaneously, they occur mostly as lexicalized items. Our data show that the first compounds appear after the emergence of noun and verb inflection and diminutives. These first compounds belong to the type of subordinate, endocentric two-member noun + noun compounds without interfixes.

Key words: child language acquisition, compounds, endocentric, interfix, Lithuanian, productivity, transparency, subordinate compound.

1. Introduction

Languages differ in the ways they form compounds, but the most favoured pattern is the one where one member determines the other by restricting its meaning, as the English *bath-room, living-room*, etc. The general meaning of the two-noun determinative compounds is therefore narrower than that of their head. Compounds are used for contrasts among sub-categories in many languages, including Lithuanian, but compounding is much less common in Lithuanian than in Germanic languages (cf. Berman & Clark 1989; Dressler *et al.* 2010).

The acquisition of compounding by children has been investigated much less than the acquisition of inflection. Only few languages have been researched in this respect, among them English (Clark *et al.* 1985, 1986), Swedish (Mellenius 1996), Hebrew (Berman & Clark 1989), French (Nicoladis 2002) and German (Dressler *et al.* 2010).

One of the most recent and extensive studies on children's acquisition of compound constructions was carried out by Ruth Berman. She

discusses data from various cross-linguistic studies (Berman 2009, 298–322) and argues that there is considerable variation in the use of compounds among children and that this process is governed mostly by the general frequency of compounds in the target language.

Compounding is, in many languages, a very effective way of creating and expressing new meanings; however, it is often quite difficult for a child to grasp the relation between the members of the compound noun. An important question that deserves to be investigated in this context is whether in an early phase of language acquisition there can be detected any regularities showing the ability to form and analyze compound words. In addition to child language acquisition research, analysis of compounds also allows us to concentrate on more general questions. To quote Lieber and Štekauer, "the nature and processing of compounds offer an unusually direct route to how language operates in the mind, as well as providing the means of investigating important aspects of morphology, and lexical semantics, and insights to child language acquisition and the organization of the mental lexicon" (Lieber & Štekauer 2009, 3–18).

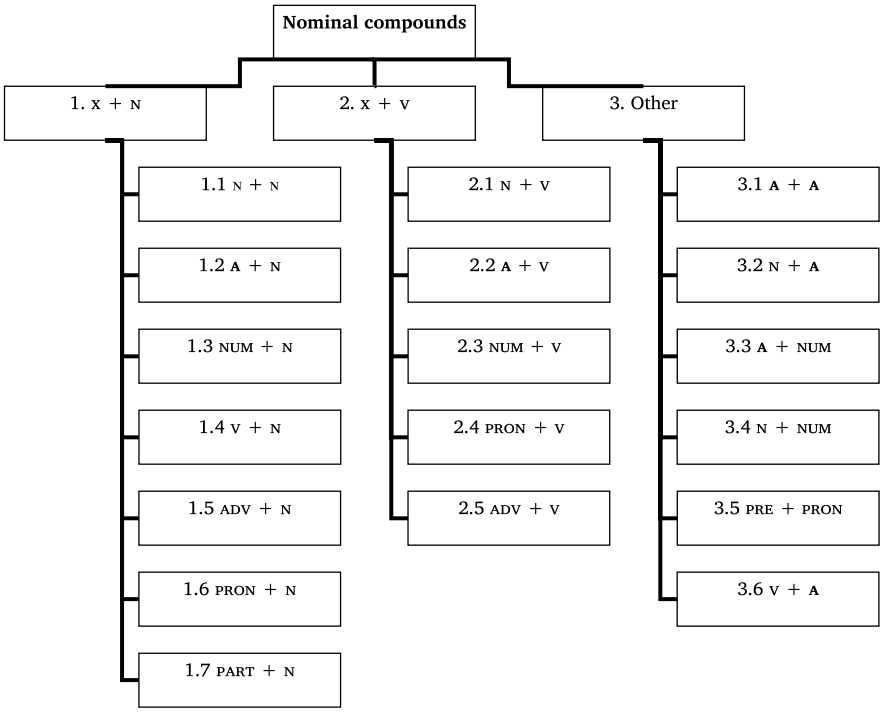
2. The structure of Lithuanian nominal compounds

Following Sergio Scalise's classification (for a more recent discussion of this classification see Scalise and Bisetto 2009, 34–53), most Lithuanian compounds belong to the group of right-headed, prototypically endocentric, subordinate compounds showing a noun-noun (N + N) structure (cf. Ambrazas *et al.* 1997). However, not all compounds in Lithuanian are of the head-dependent or endocentric type; there are also so-called *bahuvrīhi* or exocentric compounds, such as *kupranugaris* (*kupra* + *nugara* ('hump' + 'back') 'camel'). Coordinate compounds are very rare in Lithuanian; the relevant examples include *vištgaidis* (*višta* + *gaidys* ('chicken' + 'cock') 'homosexual') and *saldžiarūgštis* (*saldus* + *rūgštus* ('sweet' + 'sour') 'sweet 'n' sour').

The meaning and function of compounds in Lithuanian depend mostly on the constituents that form a compound; especially important is its second member. The majority of compounds are formed with a noun as a second element; only 20 % of compounds are formed with

a verb as a second constituent, and other combinations are even rarer (Ambrazas *et al.* 1997). Figure 1 presents the structure of compounds in Lithuanian.

Figure 1. The structure of Lithuanian nominal compounds



The formation of compounds is a complicated process due to several reasons. First, it may involve insertion of linking elements, or interfixes (see Table 1 below).

Almost half of the N + N compounds in Lithuanian are used without interfixes, whereas the other half contains interfixes. The most frequent linking element is *-a-*, and compounds with this interfix make up half of all the interfixed compounds; other interfixes are, in order of descending frequency, *-i-, -o-, -u-, -ė-, -y-, -ū-* etc. Most of the interfixes are coincident with the thematic vowel of the first member of the compound, for example, *nakt-**i**-piečiai* (*nakt-**i**-s* + *pietūs* 'night

snack') or *žem-**ė**-lapis* (*žem-**ė*** + *lapas* 'map'). Very often, however, the form of the interfix is accounted for by analogy.

Table 1. The linking elements (interfixes) in Lithuanian compounds

0	*veid-rod-is* ('face' + 'show') 'mirror' *laik-rašt-is* ('time' + 'paper') 'newspaper'
-(i)a-	*pirm-**a**-dien-is* ('first' + 'day') 'Monday'
-ė-	*žem-**ė**-lap-is* ('Earth' + 'sheet') 'map'
-i-	*aš-**i**-gal-is* ('axis' + 'end') 'pole'
-y-	*prek-**y**-viet-ė* ('goods' + 'place') 'market'
-(i)o-	*darb-**o**-viet-ė* ('work' + 'place') 'workplace'
-(i)u-	*vid-**u**-dien-is* ('middle' + 'day') 'midday'

Secondly, the process of compounding often brings about a change of inflection in the second member — in Lithuanian almost all compounds of the masculine gender end in *-is*, whereas compounds of the feminine gender end in *-ė*. For example, *ledas* 'ice' + *kalnas* 'mountain' give the compound *ledkaln-**is*** 'iceberg'. Here, the second member of the compound is a masculine noun ending in *-as*, but the inflectional ending of the compound noun changes to *-is*. The change of feminine inflection is demonstrated by the following example: *kraujas* 'blood' + *gysla* 'vein' → *kraujagysl-**ė*** 'vein'.

Instances of compounds changing their grammatical gender with respect to that of the head are not frequent, but they do occur; the relevant examples are *vidus* 'inside.masc.' + *diena* 'day.FEM' → *vidudien-**is*** 'midday.MASC', or *dirva* 'soil.fem.' + *žemė* 'land.FEM' → *dirvožem-**is*** 'soil.MASC'. There are also (N + N) compounds that refer to animates and are used with both genders, for example, *avis* 'sheep' + *galva* 'head' → avigalv-***is, -ė*** 'mutton-head', or *vargas* 'trouble' + *diena* 'day' → *vargdien-**is, -ė*** 'pauper'. However, the majority of compounds of both genders are composed of an adjective (the first member) and a noun (the second member), as in *geltonas* 'yellow' + *oda* 'skin' → *geltonod-**is, -ė*** 'yellow-skinned'; *baltas* 'white' + *plaukas* 'hair' → *baltaplauk-**is, -ė*** 'white-haired'.

Finally, the accentuation pattern of compounds is characterized by its irregular behaviour (see Stundžia & Mikulėnienė 1989) which requires specific knowledge in order to follow the rules of Standard Lithuanian. On the other hand, in colloquial speech a more simplified way of accentuation is preferred. To make accentuation easier, a simple rule can be applied for the A + N compound type, which behaves like an adjective (or a 'possessive compound' in Larsson's 2002 terminology). In compounds of this type the second member is stressed, whereas in other compounds it is the first member or the interfix that is stressed.

The use of compounds in Standard Lithuanian is not very frequent. The dominating structure is X + noun (see Figure 1), where the element X is a noun, adjective, numeral, verb, pronoun, or adverb followed by a noun as the second member of the compound. This type is the most frequent and can be used either without an interfix or with the interfix *-a-*, which is the most common one. Another type of compound has a verb as the second constituent while the first constituent is a noun, adjective or adverb. In this type the interfixes *-a-, -i-,* and *-o-* can be found. The last type of compound is not very common and can be composed of different parts of speech.

The data retrieved from the Corpus of Spoken Lithuanian (see Table 2) show that these derivatives are not very frequent in colloquial speech although compounds are clearly favoured in scientific and technical domains.

Table 2. Distribution of nominal compounds in the Corpus of Spoken Lithuanian

Type of compounding		Interfix	Number of tokens	Examples
1. X + N	N + N	0	176	*savait-galis* ('week' + 'end') 'weekend'
		-(i)a-	242	*cukr-**a**-ligė* ('sugar' + 'illness') 'diabetes'
		-ė-	15	*žem-**ė**-lapis* ('earth' + 'sheet') 'map'

Continuation of Table 2.

Type of compounding		Interfix	Number of tokens	Examples
		-i-	8	*aš-**i**-galis* (‘axis’ + ‘end’) ‘pole’
		-y-	1	*prek-**y**-vietė* (‘goods’ + ‘place’) ‘market’
		-o-	75	*darb-**o**-tvarkė* (‘work’ + ‘order’) ‘agenda’
		-u-	3	*vid-**u**-dienis* (‘middle’ + ‘day’) ‘midday’
	A + N	0	48	*brang-akmenis* (‘precious’ + ‘stone’) ‘gem’
		-(i)a-	54	*bendr-**a**-butis* (‘communal’ + ‘flat’) ‘dormitory’
		-ė-	—	
		-i-	1	*šalt-**i**-barščiai* (‘cold’ + ‘beetroot soup’)
		-y-	2	*slap-**y**-vardis* (‘secret’ + ‘name’) ‘pseudonym’
		-o-	—	
		-u-	—	
	NUM + N	0	28	*aštuon-kojis* (‘eight’ + ‘leg’) ‘octopus’
		-(i)a-	169	*ketvirt-**a**-dienis* (‘fourth’ + ‘day’) ‘Thursday’
		-i-	33	*dvi-balsis* (‘two’ + ‘voice’) ‘diphthong’
	V + N	0	7	*dels-pinigiai* (‘delay’ + ‘money’) ‘payment penalty’
		-(i)a-	12	*gimt-**a**-dienis* (‘birth’ + ‘day’) ‘birthday’

Continuation of Table 2.

Type of compounding		Interfix	Number of tokens	Examples
	ADV + N	0	1	*ryt-diena* (‘tomorrow’ + ‘day’) ‘tomorrow’
		-(i)a-	6	*daug-**ia**-butis* (‘many’ + ‘flat’) ‘apartment building’
		-i-	6	*šal-**i**-gatvis* (‘close’ + ‘street’) ‘pavement’
	PRO + N	*-(i)a-*	5	*sav-**a**-noris* (‘self’ + ‘wish’) ‘volunteer’
		-i-	15	*sav-**i**-kontrolė* (‘self’ + ‘control’) ‘self-control’
	PART + N	0	3	*kas-diena* (‘every day’)
2. X + V	N + V	0	89	*laik-rodis* (‘time’ + ‘show’) ‘clock’
		-(i)a-	16	*žin-**ia**-sklaida* (‘knowledge’ + ‘spread’) ‘media’
		-ė-	1	*saul-**ė**-lydis* (‘sun’ + ‘come down’) ‘sunset’
		-o-	13	*kalb-**o**-tyra* (‘language’ + ‘investigate’) ‘linguistics’
	A + V	0	5	*lab-dara* (‘good’ + ‘do’) ‘charity’
		-(i)a-	4	*nauj-**a**-gim** (‘new’ + ‘born’) ‘newborn’
		-i-	1	*dv-**i**-deginis* (‘two’ + ‘burn’) ‘dioxide’
		-i-	87	*sav-**i**-valda* (‘self’ + ‘rule’) ‘municipality’
	ADV + N	0	14	*pusiau-svyra* (‘half’ + ‘swing’) ‘balance’
3. Other	A + A	0	1	*juod-margė* (‘black’ + ‘many-coloured’) ‘piebald’

Continuation of Table 2.

Type of compounding		Interfix	Number of tokens	Examples
	N + A	0	2	*pus-ilguma* ('half' + 'length') 'half-length'
	N + NUM	0	1	*pusšimtis* ('half' + 'hundred') 'fifty'
	PRE + PRON	*-u-*	11	*tarpusavis* ('between' + 'self') 'mutuality'
	V + A	*-(i)a-*	1	*kalbiagarsis/garsiakalbis* ('speak' + 'loud') 'loudspeaker'
	Total		**1155**	

3. The Data

The article analyzes data pertaining to two children, the girl Monika and the boy Elvijus, who both were recorded at their home in Kaunas in various everyday situations (e.g. while playing, reading books, or eating); during the period of recording they were mostly interacting with their mothers. The ages examined are from 1 year and 6 months (hereafter abbreviated as 1;6) until 2;6 for Elvijus, and from 1;8 until 2;7 for Monika. Nearly 27 hours of the recorded speech data for Monika and 20 hours for Elvijus were analyzed. The data have been transcribed and coded using an adapted Lithuanian version of CHILDES (cf. MacWhinney 2000).

4. The Study

Before embarking on the analysis of compound acquisition in early Lithuanian child language, some general remarks about the development of morphology are in order.

Lithuanian, as a strongly inflected language, shows very early acquisition of noun and verb inflection (see Savickienė 2001, 2003, 2007;

Wójcik 2000). A derivational morphology appears much later except for diminutive formation which is a specific category in morphology, intermediate between inflection and derivation (Dressler 1997). Therefore, as shown in Savickienė (2003, 2007), the easy and fast acquisition of diminutives is a distinctive feature of Lithuanian. This phenomenon is explained by a simplified way of acquiring Lithuanian morphology (Dabašinskienė 2009).

In this section we will discuss early phases of acquisition of compounds based on the longitudinal data of two children and compare the data, wherever possible, with the respective results in other languages. In this study the analysis is focused on the children's onset of morphological development. We will discuss the development of morphology and its phases within the framework of Natural Morphology (see Dressler & Karpf 1995; Dressler 1997). Following Dressler 1997 (for Lithuanian, see Savickienė 2003), we divide early morphological development into 3 successive phases.

The **Premorphological phase** of language acquisition shows no system of grammatical morphology yet, only precursors of later grammatical rules, which consist of rote-learned forms (Dressler 1997). Children show a strong tendency towards imitation; other extragrammatical morphological operations such as reduplicative onomatopoetics and truncations are frequently used as well.

Protomorphology phase. In this phase children demonstrate their ability to search for and apply coherent, recurring patterns (Marchman & Bates 1994). Children start to construct morphological patterns of rules creatively, and many of such rules are overgeneralized (see Smoczyńska 1986; Bybee 1995; Dressler 1997). This period is characterized by children's attempts to create a more uniform grammar of the adult type (Zangl 1997).

Morphology Proper (or **modularized morphology).** In this phase the basic language-specific properties of each morphological system (e.g., noun inflection, verb inflection, or derivational morphology) are productively mastered. Children are able to understand and to produce patterns of a higher degree of complexity. During this phase children develop abilities to understand less frequent, less transparent and less salient linguistic structures and gradually acquire adult morphology, which already possesses all of its basic typological properties (Dressler & Karpf 1995).

The transition from pre- to protomorphology took place in both children at about the same time (1;9–1;10)[1]. The onset of both children's protomorphology is characterised by a steep rise of lexical diversity in nouns and by the emergence of form oppositions in noun inflection (cf. Savickienė 2003). These results further corroborate the hypothesis that a close relationship exists between lexical and morphological development ('critical mass hypothesis', cf. Marchman & Bates 1994).

The first analogies attesting to creative use of morphology occur two months after the first form oppositions have emerged in the data of both children. This supports the hypothesis that a critical mass of form oppositions is needed for a creative use of morphology to develop (cf. Bittner, Dressler & Kilani-Schoch 2003).

It is during the premorphological phase that both the girl and the boy first produce case form oppositions spontaneously. The first oppositions within the rich and productive diminutive system emerge very early as well, for instance, diminutive-simplex oppositions emerged at the same time as the inflectional form oppositions in the data of both children. Thus the children show the first steps of acquisition of inflectional and (partly) derivational systems very early, i. e., in the transition phase from pre- to protomorphology.

In this study, the data analysis is carried out to see whether the emergence of compounds parallels the acquisition of inflection. The key question is whether Lithuanian children acquire compounds and use them productively in the phase of protomorphology. In addition, we will look at the input and output correlation, which may shed light on the question to what extent the child's ability to detect morphology is dependent on the richness of morphology of the input language.

A general hypothesis regarding the development of morphology in first language acquisition states that children are very sensitive to the typological properties of the language they are acquiring (Slobin 1985; Dressler *et al.* 2010).

The main hypothesis of this study is related to Dressler's (2004) definition of the richness of morphology. We will argue that the richer the system of morphology in the language that children are acquiring, the faster they will develop it. We will apply this general rule to

[1] See Savickienė (2003) for the description and explanation of phases for Lithuanian according to Natural Morphology (Dressler 1997).

acquisition of the system of compounds. In particular, we will try to establish whether children at the end of the protomorphology phase or by the age of 3 are able (1) to produce compounds spontaneously and productively, and (2) whether they are able to apply derivational rules for noun-compounding.

In Lithuanian, noun-noun (N+N) compounds emerge in the protomorphological phase; this differs notably from the emergence of noun inflection, diminutive formation and verb inflection — the first spontaneous occurrences of inflection and diminutive formation are already observed in the pre-morphological phase. The total number of types and tokens differs in the corpora of both children (see Table 3). Despite the fact that the overall number of recordings is higher in Monika's corpus, the number of occurrences of compounds is higher in Elvijus' data[2].

Table 3. The distribution of compounds (types/tokens)

Data/ Compounds	Types	Tokens
Monika	8	30
Monika's Input	16	62
Elvijus	26	115
Elvijus' Input	43	169

Elvijus uses his first compounds during the 1;6-1;8 period (3 tokens) as imitations and during the period of 1;9 we can observe an increase in compounds (for the relevant examples see Annex 1, Table 8). From that period onward Elvijus produces approximately 4–8 different compound types every month (there were 4–14 compounds in the input, see Annex 1, Table 7). Monika's data is not so rich (see Annex 1, Table 6); the girl, as well as her mother, uses fewer compounds (see Annex 1, Table 5). Monika utters the first compound at 1;10 (that is, in the

[2] Another girl, Rūta, and her mother used compounds even more rarely. The whole inventory of compounds produced by the girl is: *kupranugaris* 'camel' (2;2), *laikrodis* 'clock, watch' (from 2;1), *dviratis* 'bike' (from 2;0), *veidrodis* 'mirror' (from 2;0), and *rankšluostis* 'towel' (2;3) (see Savickienė *et al.* 2003).

phase of protomorphology); at 1;11 the same compound is used 11 times in different forms. Further periods show quite a reverse usage of compounds in both the girl's and her mother's speech, approximately 1–3 words per month (2–6 compounds in the input).

We know that the input frequency in child-directed speech predicts the order of emergence of a particular item in the child's speech (cf. Tomasello 2003). The comparison of the children's data shows a strong correlation with the input. The data also demonstrate that there is a direct correspondence between the number of tokens in the input and the number of tokens in the output. However, in our case the analysis of compounds used by the children, even in later periods, does not provide enough evidence for claiming that these compounds are analyzed by the child. With a few exceptions, most of the compounds that occur in the data are still rote-learned.

A closer look at the data provided by both children shows interesting results. Despite the fact that there exists a very close correlation between input and output, Monika's and Elvijus' corpora show considerable differences in the use of compounds. Elvijus' corpus is characterized by higher frequency of types and tokens in the data pertaining to both the child and the mother. The predominance of N + N compounds is very marked, with N + V, NUM + N, V + N and A + N types ranking behind them. Monika's data show almost equal usage of N + N and N + V types of compounds, but quite unexpectedly not a single example of Num + N compound was found (see Table 4).

Table 4. The composition of compounds and their frequency in types and tokens in both corpora

Composition	Monika's Input	Monika	Elvijus' Input	Elvijus
	Type/ Token	Type/ Token	Type/ Token	Type/ Token
N + N	6/ 17	2/ 16	26/ 93	17/ 80
N + V	6/ 29	3/ 9	8/ 25	3/ 15
A + N	3/ 4	1/ 1	1/ 4	2/ 3
NUM + N	0	0	4/ 24	3/ 15
V + N	1/ 12	1/ 4	4/ 23	1/ 2

It is hard to say why compounds are more frequently used in one family but not in the other; however, at least one kind of explanation can be provided. Elvijus and his mother use compounds composed of numerals and nouns quite often (24 tokens for input and 15 tokens for output), for example, *dvi-rat-is* ('two' + 'wheel') 'bicycle', or another vehicle, i.e. *ketur-rat-is* ('four' + 'wheel') 'four-wheeled motorcycle'. We suppose that these nouns, as well as others, are related to the world of men, such as *malūn-sparn-is* (N + N) ('mill' + 'wing') 'helicopter', *rat-lank-is* (N + N) ('wheel' + 'hoop') 'rim of a wheel', *žol-ia-pjov-ė* (N + V) ('grass' + 'cut') 'trimmer', *tele-fon-as* (N + N) ('tele' + 'phone') 'telephone', *mikro-fon-as* (N + N) ('micro' + 'phone') 'microphone', and because of that the boy is using them more often. On the other hand, Monika's corpus includes compounds that belong to the world of women, such as *veid-rod-is* (N + V) ('face' + 'to show') 'mirror', *aus-kar-as* (N + V) ('ear' + 'to swing') 'earring', and *lūp-daž-is* (N + N) ('lip' + 'dye') 'lipstick', but these words were not very frequent. It may be suggested at this point that what seems to count for the more frequent usage of compounds is the semantic group of words which is necessary for the children's formation of lexicon. It has to be pointed out that both corpora demonstrate lexical diversity of compounds, but some of these compounds are very important in everyday life; therefore, they are found in the data of both children, for example, *gimt-a-dien-is* (V + N) ('be born' + 'day') 'birthday', *rank-šluost-is* (N + V) ('hand' + 'wipe') 'towel', *pus-ryč-iai* (N + N) ('half' + 'morning') 'breakfast'.

Many studies (cf. Slobin 1985; Peters 1997; Savickienė & Dressler 2007) have established the fact that young children prefer morphotactic (or phonological) transparency to morphotactic opacity to a much greater extent than adults. Note that interfixed compounds are morphotactically less transparent than interfixless ones. As such, an interfix does not contribute to the meaning of the compound (Dressler *et al.* 2010) and due to this reason children prefer to use interfixless forms. This tendency was observed in the first compounds produced by both Lithuanian children as well: they used more interfixless compounds or compounds with no stem changes in the first constituent of the compound word. Interfixless compounds dominate in the data of both children: *lūp-dažis* 'lipstick', *veid-rodis* 'mirror', *pus-brolis* 'cousin', *rank-šluostis* 'towel' etc. We have found that Monika used only 2 compounds with an interfix (both with *-a-*), whereas her mother used 7 interfixed

compounds (in 6 cases *-a-* and in one *-ū-)*. Elvijus used 7 compounds with an interfix (all with *-a-*), and his mother used 10 compounds, 9 with the interfix *-a-* and one with *-ė-*. Examples of the compounds with the interfix *-a-* include *gimt-a-dienis* 'birthday', *šalt-a-rankė* 'cold-handed', *kupr-a-nugaris* 'camel', *vor-a-tinklis* 'spider's web' etc.

As we have argued before, the early use of compounds demonstrates their rote-learned character. Therefore, it is not possible to claim any preferences regarding the usage of either the interfixed or interfixless compounds although the use of interfixless compounds in the data are more frequent. On the other hand, at least in some cases the insertion of an interfix into a cluster of consonants makes articulation easier, which may be a reason for a child to prefer the interfixed forms.

The criterion for pattern emergence is the appearance of mini-paradigms; this claim is elaborated by Kilani-Schoch & Dressler (2002) for inflectional morphology. It is also argued that "Whenever we find that three lemmas of the same word class, clearly distinct in morphotactic and morphosemantic properties, have emerged and recurred in spontaneous production in various contexts, we assume that the children have enough pattern variety in their uptake for detecting the morphological principle of (de)composing form and meaning word-internally. Adapted to compounding, this refers to the emergence of oppositions between compounds and their members" (Dressler *et al*. 2010, 323–344). Unfortunately, in our data not much opposition between compounds and their elements was found. The spontaneous and creative production of compounds is not observed until the age of 3;0. At 2;7 Monika uses the compound *šalt-a-rankė* ('cold' + 'hand') 'cold-handed' spontaneously. This is an adjective + noun compound and it is clear that the girl already has a comprehension of how to form this word. It is obvious that she can detect the members of the compound, *cold* and *hand*, because these two words are very frequent in her speech. This is the only compound that appeared in the girl's speech, but not in the input. At 2;2 her mother used a different word, *šalt-a-kojė* ('cold' + 'leg') 'cold-legged', which shows the same structure. This example can be taken as evidence for claiming that the structural pattern emerged in the output as well.

Conclusion and discussion

The data analysis has shown that children are sensitive to the typological characteristics of the language they acquire (cf. Slobin 1985; Peters 1997; Laaha & Gillis 2007). According to Dressler et al. "early emergence of morphological patterns appears to be best predicted by the amount of morphological richness in a given language. The wealth of productive inflectional morphology and its importance for the expression of syntactic functions (plus its role in competition with syntax) predicts early emergence of inflectional morphology" (2010, 323–344).

Can we apply this claim to compounding in Lithuanian? Although compounding is quite productive in Lithuanian, other means of word formation are used more often, namely, suffixation, prefixation and inflection. Therefore, compounds are not frequently used in adult and, consequently, in child speech.

The main findings of this study, which is devoted to the acquisition of compounds by Lithuanian children, can be summarized as follows.

First, we have found that compounds in the analyzed data of Lithuanian child language appear quite rarely, although compounding is a productive pattern of word formation. The very first compounds emerge quite early as pure imitations of adult utterances, but even later, when used spontaneously, they mostly occur as lexicalized items. Not much evidence was found to support the claim about a productive use of compounds; only one example in Monika's data (A + N: *šalt-a-koj-ė* (cold + leg) 'cold-legged') has been noted. This one case allows us to suggest that the so-called 'possessive compounds' (Larsson 2002), which are mainly adjectives (in this case with substantivized meaning), are easier for a child to analyze and to use productively. We assume that compounds where the first member (an adjective, numeral, pronoun or participle) is followed by a noun, may be semantically more transparent for a child and may therefore be preferred for productive usage. The following examples serve as a pattern for potential usage of this type of compound: *juod-a-plaukis* 'black + haired', *rud-a-akis* 'brown + eyed', *raudon-plaukis* 'red + haired', *riest-a-nosis* 'snub + nosed', *tri-ratis* 'three + wheeled'. As noted above, these compounds emerge rather late, only in protomorphology or even in modular morphology, when adjectives start to be used spontaneously (see Kamandulytė 2010). We can also assume that new compounds are formed not only

because of analogy, but also by applying abstract schemas or rules (cf. Booij 2009).

Another finding provides strong evidence for a close parallelism between input and the children's production of compounds. This study has revealed that the use of compounds by the children (both in types and tokens) is less by half as compared with those that appeared in their mothers' data. It is worth noting that the two mothers used different numbers of compounds: Elvijus' mother produced almost three times more compounds than Monika's mother. It may be stated, then, that frequency of compounds depends not only on language typology, but to a great degree on individual preferences.

Prototypical noun compounds, i. e., endocentric, subordinate and interfixless compounds emerge first and are used more frequently than interfixed ones.

The order of emergence of different types of compounds does not show a very clear pattern; according to the data, the N + N type emerges first, followed by the N + V, NUM + N, and A + N patterns, which appear almost simultaneously within 2–3 months. The types of compounds and their frequency differ in the two corpora; therefore we assume that composition of compounds is not related to frequency of occurrence. It seems that compounding serves as a means of enriching the children's lexicon. The analysis of the boy's data shows that the N + N type compounds are used quite frequently; however, this tendency was not observed in the girl's data.

Both children show preference for using interfixless compounds. That interfixed compounds are used less frequently is most probably due to their greater morphosemantic and morphotactic opacity in comparison with the purely concatenative ones. Interfixed compounds emerge later than the prototypical interfixless compounds. The most productive interfixation type (the *-a-* interfix) emerges as the first among all interfixed compounds.

These results may supplement cross-linguistic findings on the acquisition of compounds. As is well known, Germanic languages show the greatest wealth of nominal compounding, and it emerges earliest (Clark 1993, 151–159). In Romance languages and Hebrew compounding is less productive and it emerges later (cf. Clark & Berman 1984; Berman & Clark 1989); the same applies to Greek (Stephany 2010). There is not much evidence from Slavic languages, but Pačesová (1968)

reports 5 compounds that appear in the first 500 words of a young Czech child. The question is where Lithuanian, the Baltic language, can be located on this continuum. One might suggest that Lithuanian should be operating similarly to Romance languages and Hebrew, because compounds in these languages emerge around 2;0; however, they are not used productively until a later phase. It is also obvious that Lithuanian favours compounding more than Slavic languages. Therefore, at least in the context of languages mentioned here, we can place Lithuanian between Germanic (compound-rich languages), and Slavic (compound-poor languages). It has to be stressed, however, that in Lithuanian compounding is not the preferred way of word formation.

This study is the first attempt to investigate the acquisition of Lithuanian compounds. No doubt, further research of longitudinal data of more children is necessary in order to eliminate individual differences and to reveal general patterns of compound acquisition. Especially valuable should be experimental studies which are sure to provide reliable evidence on early production and comprehension of compounds.

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Abbreviations

A — adjective, ADV — adverb, DIM — diminutive, FEM — feminine gender, MASC —masculine, N — noun, NUM — numeral, PART — particle, PRE — preposition, PRON — pronoun, V — verb

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ANNEX 1. Distribution of nominal compounds in child-parent conversation

Table 5. Nominal compounds in Monika's input

Age	Compounds	Type of compound	Interfix	Tokens
1;10	*laik-rod-is* ('time' + 'show') 'clock'	N + V	0	1
	lūp-daž-is ('lip' + 'paint') 'lipstick'	N + N	0	2
1;11	*lūp-daž-is* ('lip' + 'paint') 'lipstick'	N + N	0	3
	gimt-a-dien-is ('birth' + 'day') 'birthday'	V + N	*-a-*	2
	vard-a-dien-is ('name' + 'day') 'name-day'	N + N	*-a-*	1
	veid-rod-is ('face' + 'show') 'mirror'	N + V	0	1
2;0	*gimt-a-dien-is* ('birth' + 'day') 'birthday'	V + N	*-a-*	2
	kiaur-a-samtis ('leaky' + 'dipper') 'colander'	A + N	*-a-*	1
2;1	*rank-šluost-is* ('hand' + 'wipe') 'towel'	N + V	0	15
	gimt-a-dien-is ('birth' + 'day') 'birthday'	V + N	*-a-*	5
	laik-rašt-is ('time' + 'paper') 'newspaper'	N + N	0	1
	šilt-nam-is ('warm' + 'house') 'greenhouse'	A + N	0	2
	šiukšl-ia-maiš-is ('garbage' + 'bag')	N + N	*-a-*	1
	lov-a-ties-ė ('bed' + 'lay') 'bedspread'	N + V	*-a-*	1

Continuation of Table 5.

Age	Compounds	Type of compound	Interfix	Tokens
2;2	*šalt-a-koj-ė* (‘cold’ + ‘leg’) ‘cold-legs’	A + N	*-a-*	1
2;3	*laik-rašt-is* (‘time’ + ‘paper’) ‘newspaper’	N + N	0	1
	koj-ū-galis (‘leg’ + ‘end’) ‘foot (of bed)’	N + N	*-ū-*	1
	gimt-a-dien-is (‘birth’ + ‘day’) ‘birthday’	V + N	*-a-*	2
	veid-rod-is (‘face’ + ‘show’) ‘mirror’	N + V	0	2
	pus-ryt-is (‘half’ + ‘morning’) ‘breakfast’	N + N	0	1
2;4	*pus-ryt-is* (‘half’ + ‘morning’) ‘breakfast’	N + N	0	1
	šiukšl-ia-maiš-is (‘garbage’ + ‘bag’)	N + N	*-a-*	1
2;5	*pus-ryt-is* (‘half’ + ‘morning’) ‘breakfast’	N + N	0	2
	aus-kar-as (‘ear’ + ‘hang’) ‘earring’	N + V	0	1
	rank-šluost-is (‘hand’ + ‘wipe’) ‘towel’	N + V	0	1
2;6	*pet-neš-a* (‘shoulder’ + ‘bring’) ‘brace’	N + V	0	2
	veid-rod-is (‘face’ + ‘show’) ‘mirror’	N + V	0	2
	rank-šluost-is (‘hand’ + ‘wipe’) ‘towel’	N + V	0	2
2;7	—			

Continuation of Table 5.

Age	Compounds	Type of compound	Interfix	Tokens
2;8	*pus-ryč-iai* (‘half’ + ‘morning’) ‘breakfast’	N + N	0	2
	gimt-a-dien-is (‘birth’ + ‘day’) ‘birthday’	V + N	*-a-*	1
	veid-rod-is (‘face’ + ‘show’) ‘mirror’	N + V	0	1
Total				**62**

Table 6. Nominal compounds in Monika’s speech

Age	Compound	Type of compound	Interfix	Tokens
1;10	*lūp-daž-is* (‘lip’ + ‘paint’) ‘lipstick’	N + N	0	2
1;11	*lūp-daž-is* (‘lip’ + ‘paint’) ‘lipstick’	N + N	0	11
2;0	*gimt-a-dien-is* (‘birth’ + ‘day’) ‘birthday’	V + N	*-a-*	1
2;1	*rank-šluost-is* (‘hand’ + ‘wipe’) ‘towel’	N + V	0	3
2;2	—			
2;3	*pus-ryč-iai* (‘half’ + ‘morning’) ‘breakfast’	N + N	0	2
	gimt-a-dien-is (‘birth’ + ‘day’) ‘birthday’	V + N	*-a-*	1
	veid-rod-is (‘face’ + ‘show’) ‘mirror’	N + V	0	1

Continuation of Table 6.

Age	Compound	Type of compound	Interfix	Tokens
2;4	—			
2;5	*pus-ryt-uk-ai* (‘half’ + ‘morning’) ‘breakfast:DIM’	N + N	0	1
	aus-kar-as (‘ear’ + ‘hang’) ‘earring’	N + V	0	1
	rank-šluost-ėl-is (‘hand’ + ‘wipe’) ‘towel:DIM’	N + V	0	1
2;6	*veid-rod-is* (‘face’ + ‘show’) ‘mirror’	N + V	0	3
2;7	*šalt-a-rank-ė* (‘cold’ + ‘hand’) ‘cold-hands’	A + N	*-a-*	1
2;8	*gimt-a-dien-is* (‘birth’ + ‘day’) ‘birthday’	V + N	*-a-*	2
Total				**30**

Table 7. Nominal compounds in Elvijus’ input

Age	Compound	Type of compound	Interfix	Tokens
1;4	—			
1;5	*cent-i-metr-as* (‘cent’ + ‘meter’) ‘centimetre’	N + N	*-i-*	2
1;6	*laik-rod-uk-as* (‘time’ + ‘show’) ‘clock:DIM’	N +V	0	4
	pus-met-is (‘half’ + ‘year’) ‘half-year’	N + N	0	1
	cukr-a-lig-ė (‘sugar’ + ‘illness’) ‘diabetes’	N + N	*-a-*	1
	saus-kel-nės (‘dry’ + ‘pants’) ‘nappies’	A + N	0	4

Continuation of Table 7.

Age	Compound	Type of compound	Interfix	Tokens
1;7	*foto-aparat-as* (‘photo’ + ‘device’) ‘camera’	N + N	0	4
	dvi-rat-uk-as (‘two’ + ‘wheel’) ‘bicycle:DIM’	NUM + N	0	11
1;8	*dvi-rat-uk-as* (‘two’ + ‘wheel’) ‘bicycle:DIM’	NUM + N	0	1
	dvi-rat-is (‘two’ + ‘wheel’) ‘bicycle’	NUM + N	0	2
	pirm-a-dien-is (‘first’ + ‘day’) ‘Monday’	NUM + N	*-a-*	2
	savait-gal-is (‘week’ + ‘end’) ‘weekend’	N + N	0	2
	triukšm-a-dar-ė (‘noise’ + ‘make’) ‘noise-maker’	N + V	*-a-*	2
1;9	*kilo-gram-as* (‘kilo’ + ‘gram’) ‘kilogram’	N + N	0	4
	dikto-fon-as (‘dictate’ + ‘phone’) ‘dictaphone’	V + N	0	1
	mikro-fon-as (‘micro’ + ‘phone’) ‘microphone’	N + N	0	1
	tele-fon-as (‘tele’ + ‘phone’) ‘telephone’	N + N	0	1
	cent-i-metr-as (‘cent’ + ‘meter’) ‘centimetre’	N + N	*-i-*	1
	rag-a-nos-is (‘horn’ + ‘nose’) ‘rhinoceros’	N + N	*-a-*	1
	kupr-a-nugar-is (‘hump’ + ‘back’) ‘camel’	N + N	*-a-*	4
	pus-brol-is (‘half’ + ‘brother’) ‘cousin’	N + N	0	10
	rug-pjūt-is (‘rye’ + ‘cut’) ‘August’	N + V	0	1

Continuation of Table 7.

Age	Compound	Type of compound	Interfix	Tokens
1;10	*mikro-fon-as* (‘micro’ + ‘phone’) ‘microphone’	N + N	0	2
	tele-fon-as (‘tele’ + ‘phone’) ‘telephone’	N + N	0	1
	dikto-fon-as (‘dictate’ + ‘phone’) ‘dictaphone’	V + N	0	1
	eil-ė-rašt-uk-as (‘row’ + ‘writing’) ‘poem’	N + N	*-ė-*	1
	laik-rod-uk-as (‘time’ + ‘show’) ‘clock:DIM’	N + V	0	2
	laik-rod-is (‘time’ + ‘show’) ‘clock’	N + V	0	2
	gimt-a-dien-is (‘birth’ + ‘day’) ‘birthday’	V + N	*-a-*	4
	lūp-daž-is (‘lip’ + ‘paint’) ‘lipstick’	N + N	0	1
	savait-gal-is (‘week’ + ‘end’) ‘weekend’	N + N	0	1
	sekm-a-dien-is (‘seventh’ + ‘day’) ‘Sunday’	NUM + N	*-a-*	2
	rug-pjūt-is (‘rye’ + ‘cut’) ‘August’	N + V	0	1
	rug-sėj-is (‘rye’ + ‘sow’) ‘September’	N + V	0	1
	malūn-sparn-is (‘mill’ + ‘wing’) ‘helicopter’	N + N	0	8
	vidur-nakt-is (‘middle’ + ‘night’) ‘midnight’	N + N	0	1
	pus-ryč-iai (‘half’ + ‘morning’) ‘breakfast’	N + N	0	3

Continuation of Table 7.

Age	Compound	Type of compound	Interfix	Tokens
1;11	*dvi-rat-uk-as* (‘two’ + ‘wheel’) ‘bicycle:DIM’	NUM + N	0	1
	rank-šluos-t-is (‘hand’ + ‘wipe’) ‘towel’	N + V	0	1
	pus-brol-is (‘half’ + ‘brother’) ‘cousin’	N + N	0	4
	gimt-a-dien-is (‘birth + day’) ‘birthday’	V + N	*-a-*	9
	rug-sėj-is (‘rye’ + ‘sow’) ‘September’	N + V	0	1
	pus-ryč-iai (‘half’ + ‘morning’) ‘breakfast’	N + N	0	1
	pus-seser-ė (‘half’ + ‘sister’) ‘cousin’	N + N	0	2
2;0	*tele-fon-as* (‘tele’ + ‘phone’) ‘ telephone’	N + N	0	1
	ried-lent-inink-as (‘roll’ + ‘board’) ‘skateboarder’	V + N	0	2
	rank-šluost-uk-as (‘hand’ + ‘wipe’) ‘towel:DIM’	N + V	0	2
	laik-rod-is (‘time’ + ‘show’) ‘clock’	N + V	0	1
	ketur-rat-is (‘four’ + ‘wheel’) ‘four-wheeled motorcycle’	NUM + N	0	5
	gimt-a-dien-is (‘birth’ + ‘day’) ‘birthday’	V + N	*-a-*	2
	rat-lank-is (‘wheel’ + ‘hoop’) ‘rim of a wheel’	N + N	0	8
	lap-krit-is (‘leaf’ + ‘fall’) ‘November’	N + V	0	1

Continuation of Table 7.

Age	Compound	Type of compound	Interfix	Tokens
	rank-šluost-is (‘hand’ + ‘wipe’) ‘towel’	N + V	0	1
	pus-ryč-iai (‘half’ + ‘morning’) ‘breakfast’	N + N	0	3
	veid-rod-ėl-is (‘face’ + ‘show’) ‘mirror:DIM’	N + V	0	2
	ried-lent-ė (‘roll’ + ‘board’) ‘skateboard’	V + N	0	1
	žol-ia-pjov-ė (‘grass’ + ‘cut’) ‘trimmer’	N + V	*-ia-*	1
2;1	*tele-fon-as* (‘tele’ + ‘phone’) ‘telephone’	N + N	0	2
	rat-lank-is (‘wheel’ + ‘hoop’) ‘rim of a wheel’	N + N	0	1
	lap-krit-is (‘leaf’ + ‘fall’) ‘November’	N + V	0	2
	pepsi-kol-a (‘pepsi’ + ‘cola’) ‘pepsicola’	N + N	0	1
	pėd-keln-ės (‘foot’ + ‘pants’) ‘tights’	N + N	0	1
	Vilk-merg-ė (‘wolf’ + ‘girl’) ‘name of a beer’	N + N	0	2
2;3	*tele-fon-as* (‘tele’ + ‘phone’) ‘telephone’	N + N	0	2
	tele-fon-iuk-as (‘tele’ + ‘phone’) ‘ telephone:DIM’	N + N	0	1
	gimt-a-dien-is (‘birth’ + ‘day’) ‘birthday’	V + N	*-a-*	1
	šikšno-sparn-is (‘hide’ + ‘wing’) ‘bat’	N + N	0	1
	ried-lent-ė (‘roll’ + ‘board’) ‘skateboard’	V + N	0	1

Continuation of Table 7.

Age	Compound	Type of compound	Interfix	Tokens
2;4	*foto-aparat-as* ('photo' + 'device') 'camera'	N + N	0	1
	sport-bat-is ('sport' + 'shoe') 'sneakers'	N + N	0	1
	pus-ryč-iai ('half' + 'morning') 'breakfast'	N + N	0	4
	pus-lap-is ('half' + 'sheet') 'page'	N + N	0	1
	Euro-lyg-a ('Euro' + 'league') 'Euroleague'	N + N	0	2
2;6	*centi-metr-as* ('cent' + 'meter') 'centimetre'	N + N	0	1
	kilo-gram-as ('kilo' + 'gramme') 'kilogramme'	N + N	0	1
	kilo-metr-as ('kilo' + 'meter') 'kilometre'	N + N	0	2
	gimt-a-dien-is ('birth' + 'day') 'birthday'	V + N	*-a-*	1
Total				**169**

Table 8. Nominal compounds in Elvijus' speech

Age	Compounds	Type of compound	Interfix	Tokens
1;6	*saus-keln-ės* ('dry' + 'pants') 'nappies'	A + N	0	2
1;8	*dvi-rat-uk-as* ('two' + 'wheel') 'bicycle:DIM'	NUM + N	0	1
	savait-gal-is ('week' + 'end') 'weekend'	N + N	0	1

Continuation of Table 8.

Age	Compounds	Type of compound	Interfix	Tokens
1;9	*kilo-gram-as* (‘kilo’ + ‘gramme’) ‘kilogramme’	N + N	0	10
	mikro-fon-as (‘micro’ + ‘phone’) ‘microphone’	N + N	0	4
	tele-fon-as (‘tele’ + ‘phone’) ‘telephone’	N + N	0	2
	rag-a-nos-is (‘horn’ + ‘nose’) ‘rhinoceros’	N + N	*-a-*	1
	kupr-a-nugar-is (‘hump’ + ‘back’) ‘camel’	N + N	*-a-*	5
1;10	*mikro-fon-as* (‘micro’ + ‘phone’) ‘microphone’	N + N	0	5
	tele-fon-as (‘tele’ + ‘phone’) ‘telephone’	N + N	0	2
	laik-rod-uk-as (‘time’ + ‘show’) ‘clock:DIM’	N + V	0	8
	lūp-dаž-is (‘lip’ + ‘paint’) ‘lipstick’	N + N	0	1
	malūn-sparn-is (‘mill’ + ‘wing’) ‘helicopter’	N + N	0	1
	gimt-a-dien-is (‘birth’ + ‘day’) ‘birthday’	V + N	*-a-*	1
	vor-a-tinkl-is (‘spider’ + ‘net’) ‘spider-web’	N + N	*-a-*	4
1;11	*tele-fon-as* (‘tele’ + ‘phone’) ‘telephone’	N + N	0	1
	dvi-rat-uk-as (‘two’ + ‘wheel’) ‘bicycle:DIM’	NUM + N	0	2
	rankš-luost-is (‘hand’ + ‘wipe’) ‘towel’	N + V	0	1

Continuation of Table 8.

Age	Compounds	Type of compound	Interfix	Tokens
	pus-brol-is (‘half’ + ‘brother’) ‘cousin’	N + N	0	1
	žem-uog-ė (‘ground’ + ‘berry’) ‘strawberry’	N + N	0	2
2;0	*tele-fon-as* (tele + phone) ‘telephone’	N + N	0	1
	mikro-fon-as (micro + phone) ‘microphone’	N + N	0	2
	laik-rod-uk-as (‘time’ + ‘show’) ‘clock: DIM’	N + V	0	2
	dvi-rat-uk-as (‘two’ + ‘wheel’) ‘bicycle:DIM’	NUM + N	0	1
	ketur-rat-is (‘four’ + ‘wheel’) ‘four-wheeled motorcycle’	NUM + N	0	1
	rat-lank-is (‘wheel’ + ‘hoop’) ‘rim of wheel’	N + N	0	2
	pepsi-kol-a (‘pepsi’ + ‘cola’) ‘pepsicola’	N + N	0	1
	žol-ia-pjov-ė (‘grass’ + ‘cut’) ‘trimmer’	N + V	*-ia-*	4
2;1	*tele-fon-as* (‘tele’ + ‘phone’) ‘telephone’	N + N	0	4
	rat-lank-is (‘wheel’ + ‘hoop’) ‘rim of wheel’	N + N	0	1
	pepsi-kol-a (‘pepsi’ + ‘cola’) ‘pepsicola’	N + N	0	3
	Vilk-merg-ė (‘wolf’ + ‘girl’) ‘name of a beer’	N + N	0	2

Continuation of Table 8.

Age	Compounds	Type of compound	Interfix	Tokens
2;3	*tele-fon-as* (‘tele’ + ‘phone’) ‘telephone’	N + N	0	9
	tele-fon-iuk-as (‘tele’ + ‘phone’) ‘telephone:DIM’	N + N	0	2
	gimt-a-dien-is (‘birth’ + ‘day’) ‘birthday’	V + N	*-a-*	1
	šikšn-o-sparn-is (‘hide’ + ‘wing’) ‘bat’	N + N	*-o-*	2
	pepsi-kol-a (‘pepsi’ + ‘cola’) ‘pepsicola’	N + N	0	5
2;4	*geležin-kel-is* (‘iron’ + ‘road’) ‘railroad’	A + N	0	1
	pus-ryč-iai (‘half’ + ‘morning’) ‘breakfast’	N + N	0	1
2;6	*dvi-rat-inink-as* (‘two’ + ‘wheel’) ‘cyclist’	NUM + N	0	6
	penkt-a-dienis (‘five’ + ‘day’) ‘Friday’	NUM + N	*-a-*	1
	pus-lapis (‘half’ + ‘sheet’) ‘page’	N + N	0	1
	dvi-rat-is (‘two’ + ‘wheel’) ‘bicycle’	NUM + N	0	1
	ketur-rat-is (‘four’ + ‘wheel’) ‘four-wheeled motorcycle’	NUM + N	0	2
	malūn-sparn-is (‘mill’ + ‘wing’) ‘helicopter’	N + N	0	4
Total				**115**