(Eds.)

Development of Nominal Inflection
in First Language Acquisition

...ive

SOLA

Mouton de Gruyter

Studies on Language Acquisition
30

Editor

Peter Jordens

Mouton de Gruyter
Berlin · New York

Development of Nominal Inflection
in First Language Acquisition

A Cross-Linguistic Perspective

Edited by

Ursula Stephany
Maria D. Voeikova

Mouton de Gruyter
Berlin · New York

Contents

List of abbreviations used in the present volume

1.   Grammatical codes

1P	1st person plural	FEM	Feminine
1S	1st person singular	FILL	Filler
2P	2nd person plural	GEN	Genitive
2S	2nd person singular	ILL	Illative
3P	3rd person plural	IMP	Imperative
3S	3rd person singular	INANI	Inanimate
ABESS/ABE	Abessive	INC	Incompletive
ABL	Ablative	IND	Indicative
ABS	Absolutive	INDEF	Indefinite
ACC	Accusative	INESS/INE	Inessive
ADESS/ADE	Adessive	INF	Infinitive
ADJ	Adjective	INSTR	Instrumental
ADV	Adverb	INSTRUC	Instructive
ALL	Allative	IPFV	Imperfective
ANI	Animate	LIAIS	Liaison
AOR	Aorist	LOC	Locative
ART	Article	MASC	Masculine
ASS	Assurative	MOD	Modal
AUX	Auxiliary	N	Noun
CLFR	Classifier	NEG	Negation/Negative
COLL	Collective	NEUT	Neuter
COM	Comitative	NOM	Nominative
COMP	Completive	NP	Noun phrase
COP	Copula	NR	Nominalizer
DAT	Dative	NUM	Numeral
DC	Declension Class	OBL	Oblique case
DEF	Definite	ONO	Onomatopoeia
DEM	Demonstrative	OPT	Optative
DET	Determiner	PARTIT	Partitive
DIM	Diminutive	PASS	Passive
DIST	Distal	PAST	Past tense
ELAT/ELA	Elative	PERS	Person
ERG	Ergative	PFV	Perfective
ESS	Essive	PL	Plural

The acquisition of case, number, and gender in Croatian*

Melita Kovačević, Marijan Palmović, and
Gordana Hržica

1. Introduction

Croatian belongs to the family of South-Slavic languages along with Slovenian, Serbian, Macedonian, and Bulgarian. It is spoken from, roughly, the river Drava to the Adriatic Sea (excluding parts of Bosnia & Hercegovina) and from the river Sutla on the Croatian-Slovenian border to the Danube in Slavonia, on the Croatian-Serbian border. The three major dialects, Kajkavian, Čakavian and Štokavian, are classified on the basis of the interrogative pronoun 'what'.

Croatian is a highly inflected language in which grammatical morphemes usually express three grammatical categories (e.g. case, number, and gender for nouns and adjectives and person, number and tense for verbs). The canonical word order is SVO, but overall word order is relatively free. Declensional classes are based on three gender classes. In addition there are different declensional classes across genders. Verbs are subdivided into six conjugational classes obeying different paradigmatic patterns. In addition, masculine paradigms differ for animate and inanimate nouns. Masculine nouns also distinguish between plural and paucal number (two + N, three + N, four + N) while in the feminine and neuter genders these differences are blurred by syncretism.

Derivational morphology plays an important role in the Croatian lexicon and grammar, enhancing the transparency of lemmas as well as their formal and semantic relationships. Thus, the root *bol* 'pain' serves as the base of about a dozen of derived lexemes in Croatian (e.g. *bolnica* 'hospital', *bolest* 'illness', *boljeti* 'hurt', *bolničarka* 'nurse', etc.), while their English equivalents show no derivational connection. This derivational transparency could certainly affect the process of the acquisition of Croatian lexicon and the morphological structure of this language.

In this paper we will focus on the development of case, number, and gender in early Croatian child language. The core of our arguments will focus on the question in how far the morphological richness of Croatian may promote the early development of inflection. A language with a complex morphological system, such as Croatian will impose different demands on the young child

than less highly inflected languages such as German or languages with a regular inflection such as Turkish.

2. The inflectional system of the Croatian noun

2.1. Case

The inflectional system of the Croatian noun has two numbers, singular and plural, and seven cases in each number: Nominative (Nom.), Accusative (Acc.), Genitive (Gen.), Dative (Dat.), Locative (Loc.), Instrumental (Instr.), and Vocative (Voc.).

2.1.1. Case functions

Although in traditional Croatian grammars a large number of various meanings is given for most of the seven cases (e.g. Barić et al. 1997; Raguž 1997; Težak and Babić 2000), each of them has one or a few prototypical functions. Thus, the Nominative is the basic case form used for labeling. All other cases except the Vocative express different relationships within sentence structure. The prototypical meanings of cases which express syntactic-semantic relationships within the structure of sentences are the following: the Nominative marks the subject or the predicative noun, the Accusative signals the direct object and is also governed by certain prepositions in phrases functioning as the goal of an action. The Dative expresses the indirect object of intransitive verbs and may function as recipient or goal. The Locative is used in prepositional phrases functioning as a complement of a verb. The Instrumental signals a device or company. The Genitive is the case with the greatest number of roles. The most important of these are possessor, expression of an unavailable entity (missing object as in e.g. 'there is no ...'), and the part-whole relation (genitivus partitivus). In their prototypical meanings, the Accusative represents object and goal (only with certain prepositions), the Dative represents recipient and goal (usually without prepositions), the Locative is used to denote topic and location and is always governed by a preposition, and the Instrumental represents means and company.

The Vocative case is used for calling or addressing someone. This form is disappearing from the Croatian morphological system, being substituted by the Nominative with most nouns. Its usage is mostly limited to fossilized forms of certain nouns and some proper names (e.g. *gospođa* 'madame' → *gospođo!*, *profesor* 'professor' → *profesore!*).

2.1.2. Prototypical declensions

Each of the basic gender classes has its own prototypical declension. Thus, the prototypical declension of feminine nouns ending in –*a* is known as the e-declension (traditional grammars name the declensions after the Genitive singular ending). The prototypical masculine declension is the a-declension, which differentiates between animate nouns (Acc. singular ending –*a*, homophonous to the Genitive) and inanimate ones (Acc. singular = Nom. singular). Neuter nouns are declined in the same way as masculine inanimate nouns.

2.1.3. Other declension patterns

Although the majority of the most frequent nouns belong to the prototypical declension class, some frequent nouns do not.

Masculine nouns ending in a vowel do not always take the prototypical declension pattern. Those ending in –*a* follow the e-declension. Some nouns ending in other vowels also follow the e-declension paradigm, whereas the others stick to the prototypical a-declension: proper hypocoristics (some of them serve as proper names, like *Ante* or *Ivo*) follow the e-declension (e.g. *sluga* 'servant' or given names such as *Borna, Matija*). Some masculine nouns ending in other vowels also belong to the e-declension such as hypocoristics of proper names. Most masculine proper names and foreign words follow the a-declension.

The rather small group of feminine nouns ending in a consonant (e.g. *noć* 'night', *ljubav* 'love') belongs to distinct class, the i-declension.

2.1.4. Additional rules in e-declension

Some feminine nouns ending in a vowel -a plus a velar stop k, g, or the glottal fricative h palatalize the consonant to the dental affricate of fricatives c, z, and s, respectively, before the ending –i of the Dative and Locative singular. This morphophonological change is not limited to feminine -*a* nouns but occurs in some other nouns as well.

Feminine nouns ending in –*ica* form the Vocative by –*e* instead of –*o*. Although, as stated above, the Vocative is gradually being lost, it is more often used with this group of nouns than with other feminine nouns.

There are also some rules affecting the Genitive plural. If the noun has two consonants before final –*a*, a mobile vowel –*a*– is interpolated (e.g. *sestra* 'sister' –*nemam sestara* 'I have no sisters'), or the usual ending –*a* is replaced with the alternative –*i* (e. g. *sekunda* 'second' – *5 sekundi* 'five seconds').

2.1.5. Additional regularities of the masculine a-declension

In masculine nouns with the palatal final consonant (*č, ć, š, ž, d, dž, lj, nj, j*; sometimes also *r* and *c*), the Instrumental ending –*om* is changed to –*em*, and the Vocative ending –*e* to –*u*.

2.1.6. Additional rules in the neuter a-declension

If the neuter noun includes a palatal (*polje* 'field'), a palatal group (*igralište* 'playground'), or a consonant that shares some morphophonological features of palatals (r, c – e.g. *sunce* 'sun', *more* 'sea'), their endings in the Nominative and Instrumental are –*e* and –*em* rather than the default endings –*o* and –*om*.

There is a group of nouns that do not follow this rule. They end in –*e*, but without a palatal preceding it. Instead, they have an interfix in front of the case ending in the Genitive, Dative, Locative, and Instrumental singular and in all cases in plural (e.g. *ime* 'name', *dječak bez im-en-a* 'a boy without a name'). Some other neuter nouns that follow this rule also have interfixed forms. Possible interfixes are –*en*–, –*et*– (mostly for the young of humans or animals, e.g. *tel-e* 'calf' – *nema tel-et-a* 'there is no calf') and –*es*– (doublets – nouns that can be declined with or without this interfix).

A mobile vowel –*a*– is inserted in the Genitive plural in neuter nouns with two consonants in front of the final –*a* (e.g. *pism-o* 'letter' – *nema pis-a-ma* 'there are no letters').

2.2. Number

There are two categories of number in Croatian, singular and plural. The plural is formed on the basis of the prototypical classes and declensions described above. Feminine –*a* nouns take the suffix –*e* (*djevojčica* 'girl' → *djevojčice* 'girls'), masculine –*C* nouns take –*i* (*dječak* 'boy' → *dječaci* 'boys'), while neuter nouns take –*a* (*vino* 'vine' → *vina* 'vines').

2.2.1. Short and long plural

Some masculine nouns in Croatian can have an interfix when forming plural. This is known as the 'long' plural form by contrast to the 'short' plural. The long plural is formed with the interfix –*ov*–/–*ev*– placed in front of the plural suffix. The choice of the interfix is phonologically conditioned (-*ev*- is used after a palatal). Monosyllabic nouns usually have the 'long' plural although there are

a few very frequent monosyllabic ones with a 'short' plural form. Examples of long and short plural form are the following:

slon 'elephant' → *slon-ov-i*   *pingvin* 'penguin' → *pingvin-i*
mač 'sword' → *mač-ev-i*

2.2.2. Other plural forms and collective nouns

Some Croatian count nouns may form collectives, thereby expressing uncountable quantities, e.g. cvijet 'flower' → cvjetovi 'flowers (count)' → cvijeće 'flowers (coll.)'.

2.2.3. Pluralia tantum

Croatian also possesses pluralia tantum which, although being semantically singular, have a plural declension (e.g. usta 'mouth', hlače 'trousers').

2.3. Gender

Since the suffixes of Croatian nouns are gender dependent, nominal gender is predictable. There are three genders in Croatian: feminine, masculine, and neuter. In the majority of cases, the declensional pattern is determined by gender. The three genders are not evenly distributed: masculine and feminine nouns taken together make up 86% of all Croatian nouns (43.3% masculine; 42.9% feminine), while neuter accounts for only 13.7%. These statistics are based on the analysis of the 4000 most frequent noun lemmas in the adult spoken language compiled from one million tokens and a total of 114.717 noun lemmas. (Vuletić 1991).

3. Data

The analysis of the present paper is predominantly based on the speech of the Croatian girl Antonija between the ages 1;3 and 2;8. Data from the other two children of the Croatian child language corpus (http://childes.psy.cmu.edu/data/slavic/), which consists of the transcripts of three children, Antonija, Vjeran, and Marina, whose speech was recorded between their first and third birthdays, has also been included in the statistics for additional analysis and comparisons. The entire data has been transcribed according to the CHILDES Project (MacWhinney 2000).

Table 1.   An outline of Croatian noun inflection

a. General categorization

	e-declension	i-decl.	a-declension
feminine	–a	–C	
	djevojčica	noć	
	'girl'	'night'	
masculine	–a sluga 'servant'		-C dječak 'boy'
	–a (names) Matija,		–o, –e (names) Mario, Hrvoje
	Luka		–e/–i (foreign words) ataše 'attaché',
	–e/–o (hyp.) Ivo		taksi 'taxi'
	(from Ivan)		–o (stem-final l) pepeo 'ashes'
neuter			–o/–e nebo 'sky', more 'sea'

b. Additional rules

e-declension feminine	a-declension masculine	neuter
k, g, h + i → c, z, s	animate or inanimate	infixes -et-, -en-, -es-
ending –ica → Voc. -ice	alternative Instr. and Voc.	alternative Instr. and Nom.
	endings of stems ending in	endings of stems ending in
	a palatal	a palatal
mobile a sometimes appear-	k, g, h + e → č, ž, š	
ing in Gen.Pl.		
alternative ending i some-	k, g, h + i → c, z, s	
times appearing in Gen.Pl.		
	mobile -a- sometimes appearing in Gen.Pl.	

Table 2.   Antonija's data

Age	No. of utterances (Antonija)	No. of utterances (input)	No. of word tokens (Antonija)	No. of word tokens (input)	MLU in words (Antonija)
1;3	44	163	60	555	1.36
1;4	85	238	87	1039	1.02
1;5	42	97	50	492	1.19
1;6	64	98	91	341	1.42
1;7	273	547	386	1941	1.41
1;9	197	304	481	1198	2.44
1;10	303	529	646	2120	2.13
1;11	150	212	354	1016	2.36
2;0	207	327	561	1501	2.71
2;1	334	508	892	2367	2.67
2;2	483	726	1360	3142	2.81
2;3	584	811	1578	3520	2.70
2;4	586	964	1586	3886	2.70
2;5	644	980	1737	3826	2.69
2;6	362	665	954	2654	2.63
2;7	428	701	1151	2674	2.68
2;8	371	691	904	2750	2.44

Target child. Antonija's parents are upper middle class urban dwellers; her mother is a university teacher and her father an engineer. Since both of them were born and raised in Zagreb, they speak the Zagreb Štokavian dialect which is a sort of *koine* of Štokavian and Kajkavian. A somewhat stronger influence of Kajkavian (spoken in the environment of Zagreb) can be noticed especially when Antonija talks with her grandparents. It neglects many of the morphophonological processes imposed by the standard language (which are, however, observed by the speakers of the urban language in Zagreb). It is therefore often difficult to decide whether the occurrence of such processes or their absence in the child's language are merely reflections of the input language or they rather stem from the child's own construction of the language.

The other children. The other two children have similar family backgrounds. Vjeran's mother is an English teacher, and his father an electrical engineer.

They also both speak the Zagreb Štokavian dialect. Since the boy's babysitter is from the district of Lika (and speaks a Štokavian dialect) Vjeran is less exposed to the Kajkavian dialect than Antonija.

Marina's parents also live in Zagreb. Marina's mother is a university teacher and her father is an actor. Since her father is an actor, his speech is rather close to the standard, in spite of the fact that he grew up in Zadar, a Čakavian-speaking area.

Analyzed material and method. Antonija's data are transcripts of audio-record-ings collected from 1994 to 1996 in Zagreb. The child was recorded in her home in spontaneous interactions with her parents or grandparents. Each recording session lasted about 45 minutes; there were usually three sessions per month which amounts to 42 recording sessions altogether. For the purposes of the present study, the recordings of each month have been grouped into monthly sets (see table 2). Due to personal reasons, no data could be gathered at the age of 1;8.

The speech addressed to the child is considered to constitute the input lan-guage and has been collapsed across all adults participating in the recordings. Conversations were usually related to everyday situations, such as eating, play-

ing with toys, commenting on people in Antonija's environment, etc. Formulaic expressions extracted from songs or books, as well as immediate imitations, have been excluded from the analyses. The data were analyzed in a computer-assisted way within the CHILDES project (MacWhinney 2000).

4. Main objectives

The analysis was based on the growth of noun vocabulary as well as morphological development. Parents' data are used for comparison. The analysis was constrained to the inflectional morphology. The child's (or children's) data were compared with the input language.

Seven cases, three genders, two numbers, three noun classes, and a large number of different paradigms can be viewed as a tricky acquisition task for a child acquiring Croatian (Jelaska et al. 2002). *The main aim* was to gain better insight into the impact of language's morphological complexity on the time course of the emergence of particular categories, namely, case, number, and gender within the noun system. *The main objectives* of our study may be defined by following four questions: (a) Is morphological richness in language a trigger or an obstacle for early acquisition? (b) Could morphological richness be an argument for morphological preferences in the course of early language acquisition (c) Are there functional preferences in case acquisition? (d) How much does the topic shared between child and adult result in shared lexicon and morphological features?

5. Results and discussion

5.1. Gender

Since the inflection of the Croatian noun is largely based on gender, it is important to consider the distribution of the three genders in Antonija's speech. The distribution of Antonija's early masculine, feminine, and neuter reflects the distribution of Croatian nouns in child-directed speech quite well (table 3). There is a larger number of feminine than masculine nouns (58% feminine, 36% masculine, figure 1) in the child's speech which can partially be explained in terms of the context of conversation (e.g. talk about Antonija's numerous dolls). However, another possible explanation is that the transparency of the feminine noun paradigm (see below) may influence Antonija's readiness to acquire such nouns. The absolute number of neuter nouns is relatively small throughout the

Table 3. The distribution of gender classes in child speech and input (number of tokens)

Age	MASC Antonija	FEM Antonija	NEUT Antonija	MASC Input	FEM Input	NEUT Input
1;3	6	17	1	16	85	4
1;4	11	18	8	56	135	25
1;5	4	6	0	7	34	4
1;6	4	6	0	7	34	4
1;7	37	65	1	113	222	4
1;9	26	20	1	88	64	8
1;10	51	39	11	111	200	36
1;11	35	83	2	76	141	14
2;0	23	32	3	56	124	11
2;1	31	61	13	78	242	24
2;2	67	140	13	151	311	33
2;3	79	123	12	197	314	34
2;4	67	65	19	215	277	46
2;5	65	135	9	117	385	16
2;6	48	63	7	129	263	16
2;7	47	107	11	124	275	27
2;8	26	52	1	79	230	20
Total	627	1032	112	1620	3336	326

whole period in both input and child language and corresponds to their small frequency in language in general. Moreover, the majority of them cannot be considered to belong to child language. Neuter nouns occur only in the context of food and drink and are restricted to only a few lemmas. In addition they are frequently diminutivized, but instead of standard suffixes, dialectal suffixes are used by Antonija (Palmović 2007).
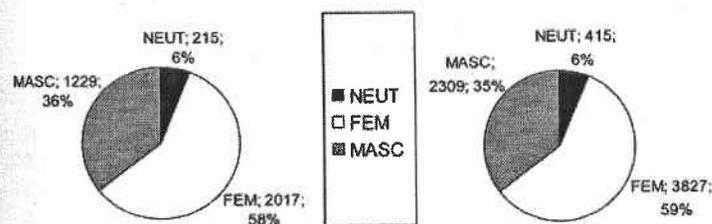

Figure 1. Distribution of gender in Antonija's speech (left) and input (right) (% of tokens)

Before turning to the details of the development of case-number inflection of nouns of the three genders, the child's overall development of declension may be described by determining the relation between the number of noun lemmas and grammatical form types of nouns. The development of Antonija's case system can be viewed from the relation between the number of noun lemmas and noun types (this will be discussed in the next section). While the number of different lemmas reflects Antonija's vocabulary, the number of different types points to the existence of the same lemmas in different cases. Figure 2 shows the increase in the number of noun lemmas, but an even faster increase in the number of noun types. This corresponds to an increasing number of noun lemmas in oppositions and mini-paradigms. A comparison of the lemma curves and the type curves of the child data with those of the input depicted in figure 2 is quite instructive since it shows that the child's speech and that of the adults are tuned to each other. Although the raw numbers in the input exceed those in the child data, the general development of the curves is similar, with the exception of the initial period, where the two child curves overlap. Such a phase is absent from the input data so that the lexical and morphological complexity of the latter can be said to precede the child's developmental phases. The overlapping lines in the first months of data collecting in Antonija's data (fig. 2, left) clearly indicate pre-morphological stage. In the same period the input data (right) indicate somewhat simplified child-directed speech.
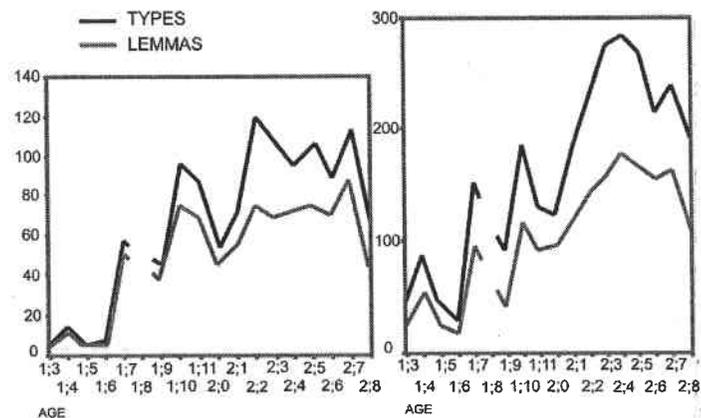
5.2. Oppositions, mini-paradigms, and paradigms

Oppositions, mini-paradigms and paradigms in child's language may be considered as a reliable indicator for the acquisition of noun inflection. They can also be viewed as the evidence for the productive use of morphological markers and outline the developmental pattern. The first oppositions appear as early as at 1;6. As shown in table 4, by the end of the recording period, five-member paradigms are present in her speech.

The first oppositions of inflected forms contrast the Nominative with the Accusative and are found in feminine nouns belonging to -e class (e.g. *lopt-a* 'ball-NomSg' *lopt-u* 'ball-AccSg'). Since the masculine nouns occurring all end in a consonant (e.g. *loptač* 'ball', *nos* 'nose', *gol* 'goal' *štapić* 'stick' (diminutive)), there is syncretism between the Nominative and the Accusative and, as the child is in the two-word-utterance phase, it is still difficult to grasp the function from the context. Accordingly, for masculine nouns in this early period the Nominative and the Accusative are hard to distinguish. Case markers of feminine nouns are therefore easier for a child to detect due to more transparent paradigms with a low degree of syncretism (different forms for different functions). Therefore, even before Antonija's second birthday several mostly feminine nouns can be found in three- and four-member mini-paradigms that consist of Nom. ~ Gen. ~ Acc. ~ Instr. and Nom. ~ Dat. ~ Acc. ~ Instr. as in the following example (Antonija, 1;10):

Figure 2. Relation between noun lemmas and grammatical form types. Left: Antonija, right: input

Table 4. Cumulative number of nouns in newly produced oppositions and mini-paradigms (Antonija)

Age	MLU (words)	2 members	3 members	4 members	5 members
1;6	1.42	3			
1;7	1.41	9	1		
1;9	2.44	13			
1;10	2.13	22	6	2	
1;11	2.36	32	9	2	
2;0	2.71	35	12	3	
2;1	2.67	43	13	4	
2;2	2.81	47	17	6	1
2;3	2.70	60	21	6	2
2;4	2.70	69	25	7	2
2;5	2.69	78	33	9	2
2;6	2.63	81	37	10	3
2;7	2.68	90	45	12	3
2;8	2.44	91	47	14	3

bak-a	*bak-e*	*bak-u*	*bak-om*
'granny-Nom'	'granny-Gen'	'granny-Acc'	'granny-Instr'

(e.g. *ide baka* (Nom.) 'granny comes', *nema bake* (Gen.) 'there is no granny', *zovi baku!* (Acc.) 'call granny!', *idem s bakom* (Instr.) 'I go with granny').

The only masculine nouns with such early mini-paradigms are the *e*-class masculine nouns *tata* 'daddy' and *deda* 'grandfather', which actually have the same paradigm as feminine nouns.

Some nouns occur only in oblique cases, i.e there is no opposition between the Nominative and Accusative, but, e.g. Genitive and Accusative. These nouns are usually used in limited contexts; thus, the partitive Genitive is often used while talking about eating and drinking (e.g. *Hocu sok-a* (Gen.) 'I want juice', *Nema čaj-a* (Gen.) 'There is no tee.'), while locations (e.g. *dućan* 'shop' and *kuća* 'house') occur in the Accusative, Genitive and Locative (e.g. *Idemo u dućan* (Acc. = Nom.) 'Let's go to the shop', but *Tata je u dućan-u* (Loc.) 'Daddy is in the shop' or *kraj kuć-e* (Gen.) 'near the house') depending on the preposition.

The question is how to interpret this finding. In the absence of the child's production of all possible case forms of a given lemma, we cannot be sure that she is in command of entire paradigms. In the theoretical framework of usage-based theories of language and language acquisition (Bybee 2001; Tomasello 2003), a likely interpretation of our data is that full paradigms and more abstract schemas gradually develop from individual grammatical types of lemmas in the course of language development. Since schemas are based on specific lexical items it is not surprising that we do indeed find a single lemma used in all possible case forms (of the singular) at 2;2. Starting at 1;10, we find all different case forms distributed across different lemmas, which means that, in the early phases of inflectional development, different lemmas fulfill different functions in syntactic contexts. Since we are here concerned with the earliest stages of the acquisition of Croatian, the development of complete paradigms and more abstract schemas will continue way beyond 2;8, when our observation stops.

5.3. Distribution and functions of case-number forms

As it can easily be predicted, the percentage of Nominative decreases with the child's age and a more diverse distribution emerges. Figures 3 and 4 provide more details of Antonija's early case system with two time points (1;7 and 2;5) being taken as two language profile representatives.

Before 1;7 the number of noun tokens per month was relatively small (between 10 and 30). Antonija produced her first words shortly before 1;3, and during the first months of recording there was a lot of babbling still present in her
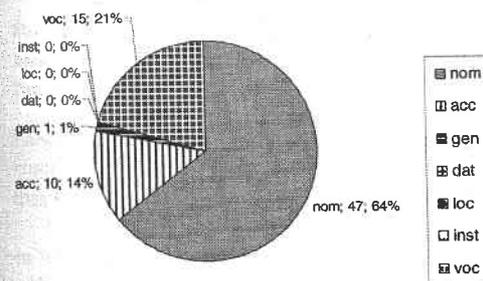

Figure 3.   Distribution of case-number forms – Antonija 1;7
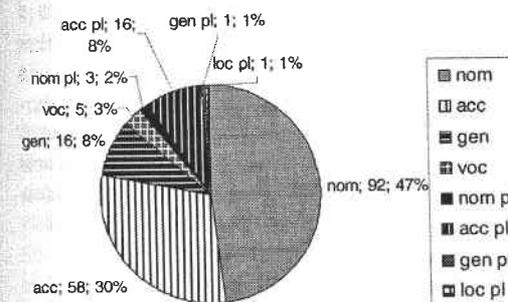

Figure 4.   Distribution of case-number forms – Antonija 2;5

speech. Naming and calling were the first functions of her (one-word) utterances. It is at 1;7 that we find a number of different case-number forms of nominal lemmas (figure 3). These are not evenly distributed, with the Nominative-Singular amounting to 64% of tokens. However, as stated in the previous paragraph, part of the production of Vocative forms is preserved only in the functional sense (established by the context) and not marked by morphological markers. The Accusative (14%) is used when referring to objects or putting something onto an object, e.g.:

> *na   stol*
> on   table:Acc.Sg.
> 'onto the table'

For many of Antonija's early nouns these three cases are homophonous, and only the context tells us whether a noun is in the Accusative, Nominative, or

Vocative case. The Genitive is restricted to a few common nouns: *čaj* 'tea', *sok* 'juice', *mlijeko* 'milk', and a few proper names including *tata* 'daddy', *deda* 'grandfather', or *baka* 'grandmother', always occurring with the two verbs *piti* 'drink' or *nema* 'not have, not be present' as in the following examples:

piti	*čaj-a*		*nema*	*tat-e*
drink	tea-Gen.Sg.		not have	daddy-Gen.Sg
'drink tea'			'daddy is not here'	

Since the Genitive is restricted to a few words; its frequency reaches only 1%.

If we subtract the percentage of Genitives from figure 3 and bear in mind that Nominative, Accusative and Vocative forms are often homophonous, the majority of the first noun lemmas occur in only one form. This implies that at 1;7 Antonija is still in the pre-morphological phase. However, it should be noted that even at that early point, when the child is still producing predominantly one-word utterances, there are 9 oppositions which clearly confirms very early morphological marking. Emergence of early oppositions could be certainly attributed to the typological features of Croatian, namely, its morphological richness. Their early presence in the child language still does not indicate the full acquisition of case morphology, but rather points to the process of the gradual construction of the grammatical system of the language being acquired.

If we choose a much later point in the data, e.g. 2;5, when the child is producing predominantly three-word utterances, we can see that the distribution of nouns looks different (figure 4). This distribution of cases is partially caused by the production of the first syntactic structures. While the percentage of the Vocative drops, the percentage of the Nominative decreases to 47% (from 64% at 1;7) and the percentage of the Accusative increases (30% from 14% at 1;7). The percentage of the Genitive increases due to the fact that it has assumed the function of expressing a possessive relation besides being governed by certain verbs. Although it is strictly speaking ungrammatical (but occurs in the input), the construction *od* + Gen. 'from + Gen.' is the first way of expressing possession in Croatian child language (Kuvač, Palmović 2002). In adult language, Genitive can be used for expressing possession only in certain syntactic contexts in which the possessor precedes the possessed noun acting as a modifier (Matasović 2000):

Mark-ov-a	*kuć-a*
Marko-Adj-Nom.Sg.	house-Nom.Sg.
'Marko's house'	

kuć-a	*kralj-a*	*Mark-a*
house-Nom.Sg.	king-Gen.Sg.	Marko-Gen.Sg.
'the house of king Marko'		

However, the Genitive seems to be a "default" way of expressing possession since children stick to the ungrammatical *od* + Gen. phrase even at school (note that this phrase is not colloquial Croatian).

The percentage of Accusatives has increased at 2;5 as compared to 1;7 due to the greater number of sentences with transitive verbs. Since Croatian is a null-subject (pro-drop) language and the subject is accordingly often omitted, the number of Accusative tokens (and that of other case forms) is relatively high as compared to languages where the Nominative plays an important role in the core structure of the sentence. By the end of the first half of her third year, Antonija uses the Accusative with a number of different verbs to express a variety of situations.

Another important function of the Accusative is to express direction, i.e. dynamic locative relations. At 2;5 Antonija commonly constructs phrases with the prepositions *na* 'at' and *u* 'in' with Accusative, but not yet with Locative. The explanation is that Antonija's early utterances relate to actions ("events") (Nelson 1985) so that she expresses direction rather than location. The expression of goal-directed, dynamic locative expressions thus precede static indications of location (such as the location of an object in a box or on a table, for example) in Antonija's development; the latter occur later.

An overall comparison of the distribution of cases in input and child language (figures 3, 4, 5, and 6) shows that the distribution of cases in the input language remains similar at 1;7 and 2;5 while the emergence of the cases in child language increases and the distribution of cases becomes more comparable to the input language. While in the input language the Accusative, Genitive and Vocative appear with a similar frequency at both points, the appearance of the Nominative slightly decreases (53% vs. 46%). Indeed, in child language the Accusative appears twice as much at 2;5 than at 1;7, there is a great increase of the Genitive (1% vs. 8%) while the percentage of Vocative case decreases noticeably (21% vs. 3%). The input language seems to be to a certain degree intuitively tuned to the linguistic abilities of the child at the respective points of development. First, due to numerous instances of pointing and naming various objects in the child's environment which document the use of a referential style on the part of the adults (Nelson 1973), the Nominative occurs more frequently at 1;7 than at 2;5.

Second, the prevalence of same cases in both input and child language is evident (Nominative, Accusative, Genitive, Vocative).
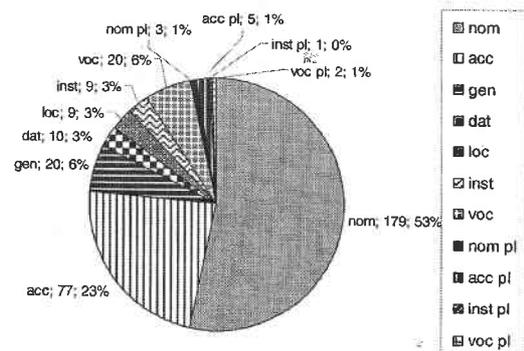
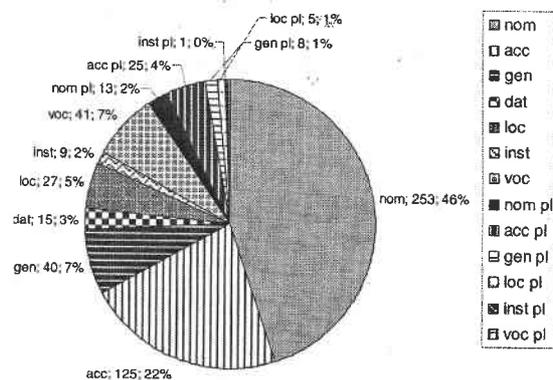*Figure 5.* Distribution of cases – input 1;7

Figure 6. Distribution of cases – input 2;5

On the other hand, the occurrence of certain case forms in child language at an early age does not mean that all of their functions have been acquired. On the contrary, usage is restricted to only some of the functions, or even more often, restricted by the situational and linguistic context (as would be predicted by Usage-Based Theories).
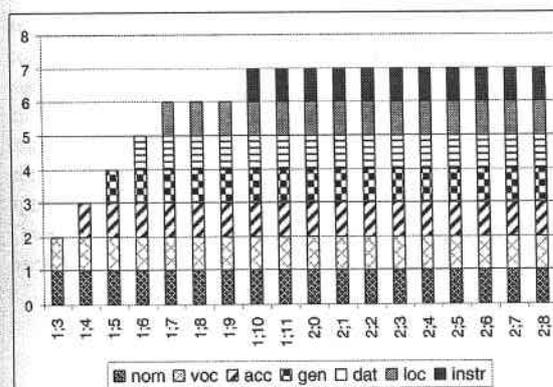
Figure 7. Order of emergence of singular case forms in Antonija's corpus

5.4.   Order of emergence of case forms

The seven cases of Croatian do not emerge all at once in child Croatian; rather, their appearance demonstrates a certain order, not only in our main subject Antonija, but also in the other two children studied in this respect (figures 8 and 9). The first case forms to occur are the Nominative and the Vocative. When used in early one-word utterances, neither of them expresses syntactic relations. Since the Vocative is most often homophonous with the Nominative the addressing function of the former and the labeling function of the latter must be told apart by context (see above). The first nouns marked for case emerge at 1;4. The order of their emergence is the Accusative (1;4) followed by the Genitive (1;5), the Dative (1;9), the Locative (1;9) and finally the Instrumental (1;10). Thus, all seven Croatian cases have emerged by 1;10 in Antonija's speech (see figure 7). Note that the figures 7, 8, 9 represent cumulative data, i.e. that the earliest time point in which more than one lemma occurs in a certain case is taken for the time point for the emergence of that case; this case is then represented in all time points (months) that follow. For example, although the Instrumental is missing from the data in 2;5 (see figure 4), it emerges at 1;10 and remains on figure 7 in the months following this point.

When the order of emergence of cases in Antonija's data is compared to that of the other two children from our corpus, Marina and Vjeran, it can be seen that the order is mainly the same for the three children. With Marina and Vjeran, some of the core cases first occur in one and the same month (figures 8 and
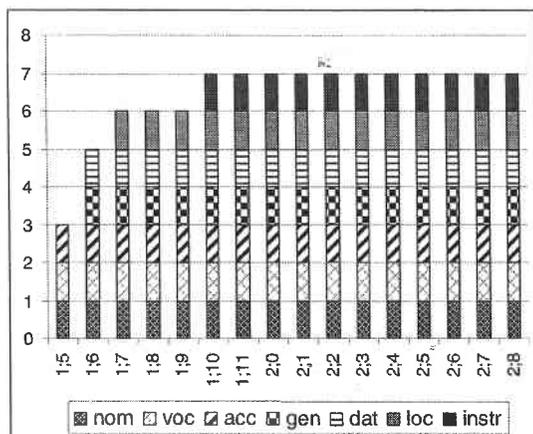
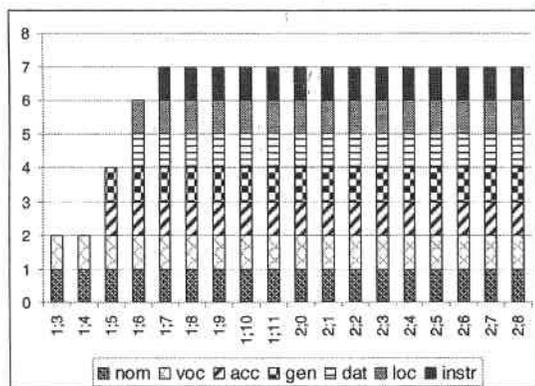*Figure 8.* Order of emergence of singular case forms in Marina's corpus

Figure 9. Order of emergence of singular case forms in Vjeran's corpus

9). This leads us to assume that there is a preferred order of case acquisition that is determined by typological features of the target language. However, in order to draw firmer conclusions in this respect additional analysis of syntactic structures would be needed.

The overall course of the acquisition of the case system, as described above, does not imply that all nouns will follow the same order. Case forms which

are pragmatically important will develop earlier. The question which cases are communicatively more important than others largely depends on the semantic classes to which nouns belong. That means that some nouns will appear in all seven cases while others (used only in certain situations) can appear in less, even in only one case. For example, the noun *godina* 'year' is found in Antonija's corpus only in the Genitive singular (*godine*) and Genitive plural (*godina*) (from age 2;3). The reason is that its most common use is with numbers, which in Croatian are constructed with nouns in the Genitive. The Genitive singular is used with the numbers 2, 3, 4, for example:

> *Imam   tri   godin-e*
> I have   three   year-Gen.Sg.
> 'I'm three years old'

The Genitive plural is used for other numbers, as in

> *Ima   deset godin-a*
> she has   ten   year-Gen.Pl.
> 'she's ten years old'

There are several other examples of nouns appearing only in the Genitive, all of them denoting food and drinks. Nouns that denote places, such as *kuća* 'house', *dućan* 'store', and *plac* 'street market', appear in Antonija's corpus only in cases expressing place and goal, that is in the Locative (place), Dative (goal), and Accusative (goal, with certain prepositions). The Nominative is thus not the first case form to be acquired of all nouns.

5.5.   Plural

The Plural is rare in Antonija's speech and only accounts for about 8% of all noun tokens (147/1780) of a small number of lemmas in the entire corpus. Most of these, particularly those found at the earlier ages, commonly occur in the plural rather than singular in the input, as well (e.g. *cipele* 'shoes', *suze* 'tears', *noge* 'legs', *šlapice* 'slippers', *smokići* 'chips', *pletenice* 'braids'). Later on, nouns commonly used with both numbers also occur in the plural (e.g. *lutke* 'dolls', *bojice* 'crayons', *kolači* 'cookies'), but, again, they denote objects in child's surroundings that are usually grouped together (e.g. a jar of cookies, a box of crayons). The first opposition between singular and plural forms occurs at 2;1:

> *šlapic-a*   *šlapic-e*
> slipper-Nom.Sg.   slipper-Acc.Pl.

More oppositions between singular and plural forms can be found at 2;3 (4 nouns) and 2;5 (3 nouns).

Because of the low frequency of plural case forms, it is hard to determine the development of case distinctions in the plural. As previously stated, while case forms in the singular are regularly used after they have first emerged, this does not apply to cases in the plural in Antonija's data. Also, Plural cases do not follow the same order of emergence as singular cases. Taken together with the scarcity of data, this does not allow us to come to any justified conclusions as to whether the appearance of a certain plural form is accidental or represents an instance of a slowly emerging paradigm. However, the data indicate that there are more regular appearances of plural forms after 2;1 while the Nominative and the Accusative are the cases that appear most frequently. The variety of different case forms in the plural is blurred by an even greater degree of syncretism than in the singular.

Some cases even do not appear in the plural at all, such as the Dative in Antonija's and Marina's corpuses, the Instrumental in Antonija's corpus, and the Vocative in Marina's and Vjeran's corpuses (figures 10, 11, 12); therefore, the data in the plural are not represented cumulatively.

Given the scarcity of data on plural case forms and the many gaps in their use in Antonija's speech, it is, impossible to demonstrate that any of them is productively used so that emerging schemas will remain strictly tied to a few lexical items in the second half of her third year.
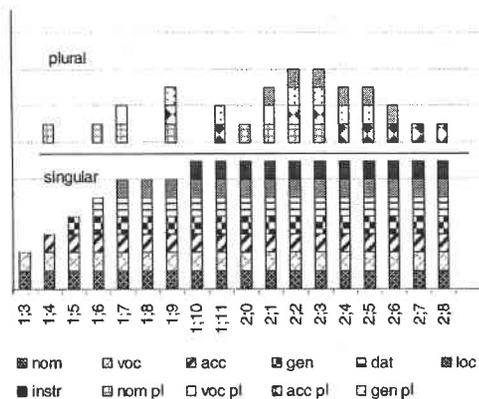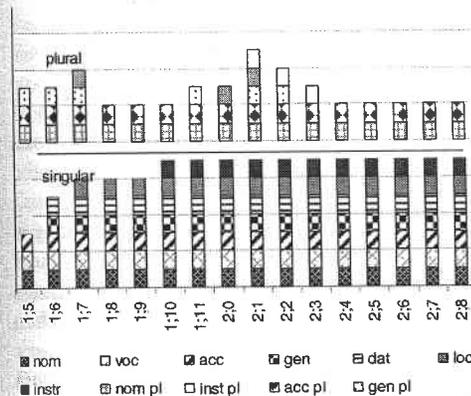

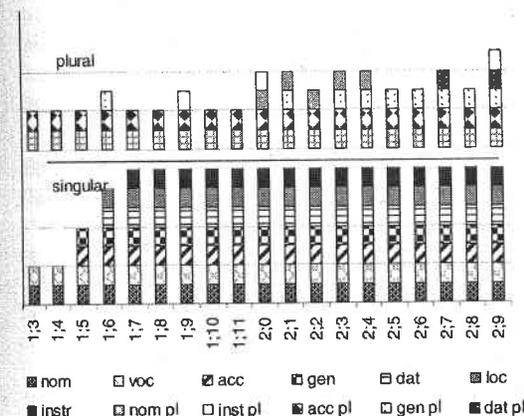*Figure 11.* Order of emergence of cases in the singular and the plural – Marina

Figure 12. Order of emergence of cases in the singular and the plural – Vjeran

5.6. Error analysis

Although errors and overgeneralizations are not only regarded as a challenging topic (e.g. Klampfer et al. 2001), but also as a good source of evidence in a process of acquisition of morphology, Croatian data are not very informative in this respect. Taking morphological complexity as a starting point which

Figure 10. Order of emergence of cases in the singular and the plural – Antonija

can be viewed as a fertile ground for morphological errors we note that there are surprisingly few inflectional errors produced by the child studied in this paper.

In Antonija's entire corpus, only twenty errors related to the inflexion of the noun occur, i.e. there are 20 tokens of erroneous forms in relation to 1,780 noun tokens. Their analysis, compared to correctly inflected forms, allows making the following general observations: A) The child always produces a morphological marker, regardless of its correctness. In other words, morphological marking is preferred to non-marking. This could be explained by the effect of morphological complexity. The child is aware of frequent presence of morphological markers and accordingly tries to fill morphological slots by producing markers. B) When a noun requiring case marking is constructed with a preposition, the child more frequently selects the adequate preposition rather than the correct morphological marking. This could be explained by the fact that a preposition carries greater weight than the inflectional marker which is determined by the case. For example, there are 7 errors concerning prepositions u 'in' and na 'on', such as the wrong choice of the case marker for the masculine noun park 'park':

*u park-*i*   instead of u park-*u*
in park-Loc.Sg.Fem.   in park-Loc.Sg.Masc.

The child may not choose the right case marking with a preposition that governs two possible cases (Accusative and Locative) which could also imply that the child has not yet acquired relevant syntactic parameters (there are no such errors with the Accusative).

There are some errors related to pluralia tantum, which the child tries to inflect in the singular (five tokens); for example:

ust-ek-u   instead of *ust-ek-ima*
mouth-Dim-Loc.Sg.   mouth-Dim-Loc.Pl.

kolic-om   instead of *kolic-ima*
stroller-Instr.Sg.   stroller-Instr.Pl.

6. Conclusions

The analysis of the speech of a Croatian child, Antonija, recorded between the ages of 1;3 and 2;8, has provided evidence for answering the questions raised at the beginning of this paper. Rather than being an obstacle morphological complexity proves to be a trigger for the early development of inflection. The first oppositions of case forms appear at the age of 1;6 so that the first grammatical

markers are already used in the one-word stage. Such a course of morphological development differs significantly from that of other morphologically less complex languages. Being confronted with morphological richness in the target language (Kovačević et al. 1998), the child behaves as an 'efficient' learner from the very beginning balancing between the acquisition of vocabulary and morphology. After a critical vocabulary mass has been reached, the see-saw starts shifting to the other side. This is nicely documented in figure 2 by a sudden increase in grammatical types while the number of lemmas increases at a slower pace. In other words, there is no 'cutting-point' between an initially merely lexical acquisition and a later morphological development, but rather gradual growth of the morphological structure by accumulating items of grammatical forms. In a morphologically rich language such as Croatian a child will soon encounter more than one grammatical form of many nouns and these will gradually develop into item-based grammatical schemas, some of which will become productive in the course of development. The 'efficient' learner stretches further, making a complex system simpler. Contrary to the verbal system, in which this is achieved mostly by overgeneralizations (Anđel et al. 2000), simplicity is achieved in noun morphology by identifying the 'proper' paradigm, one that assures the most efficient communication. In this respect the feminine e-class paradigm appears as the paradigm with the highest level of transparency in Croatian.

The order of emergence of cases is relatively stable across all three children in the Croatian corpus. The order of their appearance is defined by case function and it is determined by context. The Nominative and the Accusative emerge first expressing core sentence relations. However, since early vocabulary is highly contextualized, certain nouns appear only in restricted contexts, i.e. in particular collocations which require particular cases. These cases are not necessarily the first cases to appear in the course of acquisition, i.e. the Nominative, Accusative and Vocative. On the other side, because of this context-determined noun usage it is not very likely that the whole paradigm will appear on one target lemma. The early appearance of oppositions and mini-paradigms on different lemmas, especially in e-class nouns, can therefore serve as a sign of a productive use of case forms. Moreover, the plural in Croatian takes long time to acquire. School age children still experience difficulties in forming proper plural forms, and even adults sometimes produce ungrammatical plurals. However, although with low frequency, the plural appears relatively early, but it is restricted to prototypically paired objects such as hands, gloves, shoes, or feet.

There is a certain degree of parallelism between child and adult language. Figure 2 can be informative in this respect, as well: it shows that the number of types increases not only in child language due to the acquisition processes, but also in the input data. Of course, the absolute number of occurrences of any

category is always in favor of the input language; however, speaking in relative terms, the appearance of all categories is similar.

This paper has focused on nouns to the exclusion of pronouns and adjectives, which are also marked for case and number in Croatian. A full account of the acquisition of the inflexion of nominals of the Croatian language will have to include these parts of speech and also take later stages of language acquisition into consideration.

Notes

References

Anđel, Maja, Sabine Klampfer, Marianne Kilani-Schoch, Wolfgang U. Dressler, and Melita Kovačević
  2000   Acquisition of verbs in Croatian, French and Austrian German: An outline of a comparative analysis. *Suvremena lingvistika*, Vol. 1-2, No. 49-50: 5–27.
Barić, Emilija, Mijo Lončarić, Dragica Malić, Slavko Pavešić, Mirko Peti, Vesna Zečević, and Marija Zinka
  1997   *Hrvatska gramatika* [Croatian Grammar]. Zagreb: Školska knjiga.
Bybee, Joan
  2001   *Phonology and Language Use*. Cambridge: Cambridge University Press.
Jelaska, Zrinka, Melita Kovačević, and Maja Anđel
  2002   Morphology and semantics: The basis of Croatian case. In *Pre- and Protomorphology: Early Phases of Morphological Development in Nouns and Verbs*, Maria D. Voeikova and Wolfgang U. Dressler (eds.), 177–189. München: LINCOM Europa.
Klampfer, Sabine, and Katharina Korecky-Kröll
  2001   Morphological potentiality in children's overgeneralization patterns: Evidence from Austrian German noun plurals. *Wiener Linguistische Gazette* 67–69: 25–44.
Kovačević, Melita, Zrinka Jelaska, and Blazenka Brozović
  1998   *Comparing lexical and grammatical development in morphologically different languages*. In *Perspectives on Language* Acquisition: Selected Papers from the VIIth International Congress for the Study of

          Child Language, Ayhan Aksu-Koç, Eser Ergunvanlı Taylan, A. Sumru Özsoy, and Aylin Küntay (eds.), 368–383. Bebek/Istanbul: Boğaziçi University Printhouse.
Kuvač, Jelena, and Marijan Palmović
  2002   The course of acquisition of possessive pronouns in Croatian. Paper read at the IX. International Congress for the Study of Child Language, Madison, WI, 16–21 July, 2002.
MacWhinney, Brian
  2000   *The CHILDES Project: Tools for Analyzing Talk*. Hillsdale, New Jersey: Lawrence Erlbaum.
Matasović, Ranko
  2000   The possessive and adjective phrases in Croatian. *Suvremena lingvistika*. Vol. 1-2, No. 49-50: 99–110.
Nelson, Katharine
  1973   Structure and strategy in learning to talk. *Monographs of the Society for Research in Child Development*, 38 (No. 149).
  1985   *Making Sense: The Acquisition of Shared Meaning*. New York: Academic Press.
Palmović, Marijan
  2007   The acquisition of diminutives in Croatian. In *The Acquisition of Diminutives: A Cross-Linguistic Perspective*, Ineta Savickienė and Wolfgang U. Dressler (eds.), 73–88. Amsterdam/Philadelphia: John Benjamins.
Raguž, Dragutin
  1997   *Praktična hrvatska gramatika* [Practical Croatian Grammar]. Zagreb: Medicinska naklada.
Težak, Stjepan, and Stjepan Babić
  2000   *Gramatika hrvatskoga jezika: Priručnik za osnovno jezično obrazovanje* [Croatian Language Grammar: Basic Language Handbook]. Zagreb: Školska knjiga.
Tomasello, Michael
  2003   *Constructing a Language: A Usage-Based Theory of Langauge Acquisition*. Cambridge, MA: Harvard University Press.
Vuletić, Dušanka
  1991   *Istraživanje govora* [Speech Research]. Zagreb: Fakultet za defektologiju.