



universität
wien

MASTERARBEIT

Titel der Masterarbeit

„Productivity in Serbian Inflection and Derivation in terms
of Natural Morphology”

Verfasserin

Tijana Radisavljević

angestrebter akademischer Grad

Master of Arts (MA)

Wien, 2013

Studienkennzahl lt. Studienblatt:

A 066 867

Studienrichtung lt. Studienblatt:

Allgemeine Linguistik: Grammatiktheorie und kognitive
Sprachwissenschaft

Betreuer:

Emer. O. Univ.-Prof. Mag. Dr. Wolfgang U. Dressler

Acknowledgements

I wish to thank a lot of people that have contributed to the successful completion of my Master Study.

Above all, I would like to express my deep gratitude to my supervisor Prof Dr. Wolfgang U. Dressler, whose immense knowledge and brilliant intellect have influenced me a lot to choose this topic as a main focus during my Master Study at the University of Vienna.

Special thanks go to all my professors, to friends from Serbia and to my University colleagues, among whom Milena and Vladan, for their suggestions and cooperation during this Master thesis, as well as to Katharina, Costanze and Aneta for their useful advice and help.

Finally, I would like to thank my family for having made my study in Austria possible and for giving me motivation for proceeding, even in very difficult situations. My particular thanks go to my sister Tanja Jaga for revising my Thesis and keeping my spirits up. I must not forget to convey my special thanks to my boyfriend's family, for making our dreams come true as well as for providing me with precious examples (especially of verbs) from the Serbian language.

Last, but not least, I want to thank my boyfriend, for his endless love, immense support and patience during the writing of this Thesis.

Vienna, 2013

Table of Contents

Introduction	1
1. The framework of Natural Morphology.....	3
1.1. First subtheory- Universal markedness.....	3
1.2. Second subtheory- Typological adequacy	8
1.3. Third subtheory- Language specific system adequacy.....	9
1.4. Conclusion	10
2. Productivity.....	12
2.1. Introduction	12
2.2. What is productivity? - Qualitative approaches	12
2.2.1. Earlier theories on productivity	12
2.2.2. Productivity within NM framework- grammatical productivity	13
2.2.3. Productivity and the interaction with other factors.....	15
2.2.4. Productivity vs. creativity	17
2.2.5. Productivity on the level of norms	18
2.3. How to measure productivity? - Quantitative approaches.....	21
2.3.1. Aronoff's (1976) productivity index.....	21
2.3.2. Baayen's (& Lieber, 1991; 1992) productivity measures.....	23
2.4. Productivity within psycholinguistic models	26
2.5. Conclusion	29
3. Short sociolinguistic view on Serbian.....	30
4. Productivity in Inflection.....	32
4.1. An overview of Serbian nominal morphology	34
4.1.1. Traditional classification of Serbian nouns	35
4.1.2. New classification of Serbian nouns.....	37
4.1.3. Grammatical productivity of Serbian nominal classes	42
4.2. An overview of Serbian verbal morphology	51
4.2.1. Inflectional productivity of Serbian verbal classes.....	53
5. Derivation vs. Inflection	59
5.1. Traditional approaches to distinction derivation vs. inflection.....	59
5.2. Derivation-Inflection Continuum (within NM)	62

6. Productivity in Derivation.....	63
6.1. The syntagmatic dimension of productivity in derivation	64
6.2. The paradigmatic dimension of productivity in derivation.....	66
6.2.1. The scale of the probability of the application of WFRs	66
6.2.2. Analogical formation.....	67
6.3. Evaluative morphology in Serbian.....	70
6.3.1. Structure of Serbian diminutives	70
6.3.2. Non-prototypical nature of diminutives	72
6.3.3. Augmentative noun suffixation	74
6.3.4. Productivity of Serbian evaluative suffixes	76
6.4. <i>Nomina agentis</i> and feminine motion and their productivity	77
6.5. Conclusion	80
7. Evidence for productivity from First Language Acquisition.....	81
7.1. Early productivity in noun inflection.....	83
7.2. Early productivity in verb inflection.....	85
7.3. Early productivity in derivation-diminutives	86
7.4. Early productivity in derivation-agent nouns and feminine motion.....	88
8. Some typological notes on Serbian productive morphology	90
8.1. The inflectional class system from a typological point of view.....	90
8.2. The Word Formation from a typological point of view	91
8.3. Typology and First Language Acquisition	93
Conclusion	95
References	99
Abstract (English)	105
Abstract (German)	106
Appendix	108
Curriculum vitae	109

Introduction

‘Cross-linguistically frequent’, ‘intuitively plausible’, ‘cognitively simple’, ‘elementary’, ‘universally preferred’, ‘unmarked’ are all expressions that have been used in the morphological literature to describe the phenomenon of ‘naturalness’ and ‘natural’ morphological processes, rules or coinages in both synchronic and diachronic change. This concept of naturalness in morphology is a gradual process and one morphological unit is felt as more or less ‘natural’ to native speakers’ ears and their grammatical knowledge. The framework of Natural Morphology studies exactly those linguistic phenomena that contribute to the higher levels of naturalness of rules, words or processes under consideration. It looks for evidence of theoretical conclusions in different areas of language use, such as for example in the integration of loan words into one language, in the production of small children (i.e. first language acquisition) or in the diachronic change.

One of many concepts in the model of naturalness is the notion of productivity, which has been one of the most investigated notions in morphological studies for years. For different scholars the term ‘productive’ may mean various things, i.e. some terminological differences of opinion are present (cf. Bauer, 2001). But, intuitively, we feel that there is ‘something’, i.e. some reason for why certain inflectional endings or affixes are used more frequently than the others (competing) or why loan words follow certain language-specific paths instead of other possible during the process of integration into the morphological system of the target language. These are only few of the questions raised within the study of productivity, how this phenomenon may be measured and how relevant it is for the study of integration of loan words.

This Master Thesis presents qualitative, quantitative and psycholinguistic investigation of the productivity, with the special focus on productivity in noun and verb inflection in the Serbian¹ language. For the sake of better representation of theoretical concepts, I will sometimes use examples from other languages as well. The central part of this paper is laid on the study of productivity within the framework of Natural Morphology (abbr. NM; Dressler et al., 1987). I will use examples from the Serbian or Croatian language in order to represent productive inflectional classes, both nominal and verbal. Furthermore, within Serbian derivation, one non-prototypical process (formation of diminutives) and one prototypical (formation of nomina agentis) will be analysed in terms of the productivity criteria and scales proposed in this theoretical approach (i.e. Natural Morphology). As external

¹ As explained in more detail in chapter 3 in this Thesis, I interchangeably use terms Serbian, Croatian or Serbo-Croatian for referring to the same language from the linguistic point of view.

evidence for productivity and the concept of naturalness, I will provide examples from first language acquisition in the Croatian or Serbian language.

To sum up, the whole Thesis will be encompassed by the framework of Natural Morphology aimed at description of productive verb and noun inflectional classes and productive derivational patterns (especially formation of diminutives and agent nouns) in Serbian. For such an investigation, various sources will be used: Serbian grammars, dictionaries of loan words, slang dictionaries and evaluation tests with native speakers. Moreover, an overview of the productivity in first language acquisition, i.e. early development in terms of productivity of the first emerged patterns in the Serbian inflection and derivation will be provided by analyzing of the corpus of one Croatian-speaking girl (available online, CHILDES database). Some notes on typological properties of the Serbian inflectional and derivational system, as well as the importance of typology in first language acquisition, will be discussed in the final chapters of the Thesis.

1. The framework of Natural Morphology

"In Natural Morphology (henceforth NM), 'natural' is synonymous with cognitively simple, easily accessible (esp. to children), elementary and therefore universally preferred, i.e. derivable from human nature or with the terms unmarked or rather less marked: for in NM it is clearly a relative, gradual concept."

(Dressler, 2005)

The theory of Natural Morphology is based on the concepts of markedness (Jakobson, 1941) and on the model of Natural Phonology (Stampe, 1973). The central term in the Natural Morphology framework (NM) is the notion of naturalness. This theory was made in order to account for what is more or less natural among comparable morphological phenomena. Within the NM model, the term 'natural' means universal and unmarked, whereas less natural items are considered to be more marked. Therefore, both markedness and naturalness are to be treated as gradual concepts (e.g. unmarked, less marked, and marked). Natural Morphology has been founded in the late '70s and in the '80s, as a joined work by W. Mayerthaler, W.U. Dressler and W.U. Wurzel (Dressler et al., 1987; Dressler, 2000). This central concept of 'naturalness' covers actually many more concepts proposed within the NM and they are divided into 3 subtheories. They may be considered also as 'filters' for possible words, showing that universally preferred morphological choices may be disallowed by typological properties or language-specific properties (Dressler, 2005).

1.1. First subtheory- Universal markedness

This subtheory deals with the system-independent morphological naturalness and was first proposed by Willi Mayerthaler in 1981. It is a preference theory (cf. Dressler, 2005), which establishes the degrees of universal preferences on a set of naturalness parameters that hold for both extragrammatical (e.g. *zig-zag*) and grammatical morphology (inflection and word formation). According to this view, naturalness refers to cognitive simplicity, easy accessibility, dealing with what is universally preferred on a given parameter. The most important parameters are: iconicity, morphosemantic transparency, morphotactic transparency, the parameter of binarity, the parameter of optimal shape, etc (cf. Dressler, 2000; 2005). The most important preferences (1-8) will be briefly described below.

- 1) Preference for iconicity is derived from the Pierce's (1965) well-known view on icons and hypoicons: images, diagrams and metaphors. Among them, the most iconic ones are images, because they are based on the direct similarity between the signifier (i.e.

signans) and the signified (i.e. *signatum*). Diminutive formation via palatality is taken to be an excellent example for this universal preference, which was confirmed in various experiments, especially with small children (Dressler & Merlini Barbaresi, 1994). Diagrams are analogical relations between the signifier and the signified, which may be very well exemplified by endocentric compounds, where the distinction between head and non-head holds on both levels, namely semantically and formally.

Mayerthaler (1981) argued for constructional iconicity to be the most important subparameter within morphological iconicity. For example, within English derivation, constructional iconicity is highest for affixation, less for modification (v. *sing* > n. *song*) and the least for conversion (v. *cut* > n. *cut*). Based on naturalness principles, this means that affixation is expected to be more productive and frequent than modification or conversion, which crosslinguistically holds for lots of languages. Similarly, also for English inflection holds that the most iconic, least marked and the most natural option for plural formation is expressed diagrammatically, by adding *-s* (e.g. *boy-s*). Plural formations such as *tooth-teeth* are less iconic and thus said metaphorical, whereas examples like *fish-fish* are non-iconic. In some languages there are instances of anti-iconic plural formation, which is characterized by deletion of word-final consonant(s), i.e. the addition of meaning (here plural) is obtained by a subtraction of a form (e.g. in a Franconian German dialect Sg. *hond*, Pl. *hon* 'dog'). However, extragrammatical formations (e.g. *zig-zag*) are usually even more iconic (Dressler, 2005). The preference for high iconicity is confirmed in the production of children, whose first used forms are formed via diagrammatic suffixation rules.

- 2) Preference for indexicality is also derived from Pierce (1965) and his definition that an index is a sign whose signans directly refers to the signatum, i.e. it refers deictically. This results in the preference of adjacency to distance within indexical relations. On this parameter, affixation is also more natural than other derivational processes, because there is a clearer indexical relation between an affix and its base. Because of that, processes that involve elements inserted between the base and an affix are considered unnatural on this parameter. For example, in Serbian there are some inflectional classes with a stem amplification between the base and corresponding ending for case (e.g. Nom. Sg. *dete* 'child', Gen. Sg. *dete-t-a* vs. Nom. Sg. *dečak* 'boy', Gen. Sg. *dečak-a*), which can be a good example for an unnatural inflectional process. Similarly, compound formations via interfixes between the two elements are less natural than the formation without this 'superfluous' element (e.g. in Serbian: *rib-o-lovac*, Eng. lit. *fish-o-hunter* 'fisherman' vs. *Beo-grad*, Eng. lit. *white-city* 'Belgrade'). From the same adjacency reason, endocentric compounds are preferred to exocentric ones, because their heads are found within the compound, i.e. the access to their head is much easier.

- 3) Preference for morphosemantic transparency is understood as the preference for fully compositional meaning, which generally holds for inflectional meanings (cf. Dressler, 2005). Semantic compositionality is usually higher for inflection, since the meaning of the inflected affixed form is typically referred to as ‘the sum’ of meanings of the base plus the affix. For example Sg. *flower* + -s= Pl. *flowers*. But, cases of less iconic plural formations, for example *foot-feet*, result in less morphosemantic transparency.

On the other hand, Frege’s principle of compositionality holds only for syntax and not for word formation, which means that full morphosemantic transparency in word formation is not realizable. Actual words are stored together with word meaning. Thus, we must distinguish word formation meaning (Ger. *Wortbildungsbedeutung*) from the word meaning (Ger. *Wortbedeutung*). Symbolic word formation rules contribute to the morphosemantic and morphotactic transparency of derivatives and can predict only word formation meaning (cf. Corbin’s term *sens construit*, 1987) and not word meaning (Dressler, 2005). For example, if we take the word ‘*compos-ition*’, morphosemantic motivation is understood as ‘rule-predicted word-formation meaning’ i.e. ‘act/result of composing’. On the other hand, a lexicalized word meaning is not fully predicted by the word formation meaning, but is rather stored in the lexicon, i.e. here: ‘mental constitution, compromise’. Lack of transparency is labeled as opacification, whose end point is actually the point of fossilization. This notion means that members of one complex word are hardly identifiable, such as for example some English compounds that are not recognizable as compounds any more (*lady* and *lord*). Similarly, Serbian words *sunce* ‘sun’, *lice* ‘face’, *srce* ‘heart’ are not recognizable as derived words any more, namely diminutives (with the suffix -ce) from *sun*, *lik* and *sr*, respectively (Stevanović, 1964). These facts mean that the higher level of lexicalization, the higher level of opacity and therefore the lower level of transparency.

In word formation, derivational formations are less transparent than the compound ones (cf. Libben’s scale of morphosemantic transparency of compounds, 1998), which is confirmed from evidence in the first language acquisition research (Dressler, 2005).

- 4) Preference for morphotactic transparency results in the fact that the most natural inflectional forms or complex words in one language are those that may be decomposed into smaller parts without any difficulties for the process of perception. Thus, morphotactic opacity is caused by several reasons, which may be presented in a kind of a scale, starting from the less ‘opacifying’ one, namely phonological alternations - morphonological alternations – allomorphic alternations – weak suppletion - strong suppletion. For example in Serbian, morphotactic transparency is higher for assimilation in e.g. Sg. *vrabac*- Pl. *vrapci* ‘sparrow’ than for a palatalization process e.g. Sg. *dečak*- Pl. *dečaci* ‘boy’ whereas examples of weak suppletion e.g. Sg. *kći*- Pl. *kćeri* ‘daughter’ or

strong suppletion e.g. Sg.čovek-Pl. *ljudi* 'man' represent the lowest degree of morphotactic transparency and are thus said to be unnatural on this parameter.

Another natural preference also contributes to the overall higher level of morphotactic transparency, namely the preference for continuous morphs. For example, prefixation and suffixation are more natural and more preferred on this preference than other discontinuous processes, such as infixation (involves discontinuous bases) or circumfixation (involves discontinuous affixes).

Moreover, the general preference for word-based morphology goes hand in hand with other factors within the preference for morphotactic transparency. This means that the most natural bases for processes in word formation are actually uninflected citation forms (cf. Dressler, 2005). An example of word based morphology is Ser. Nom. Sg. *ljubav* 'love' Gen. Sg. *ljubav-i*. Crosslinguistically speaking, there are also less preferred realizations on this parameter, for example smaller bases than autonomous words (in Slavic languages), or pluralized members of compounds (in Romance languages). In other words, a stem may be described as a part of a word that remains when a suffix is removed and it must have at least one suffix more than a root. Since stems are considered to be less transparent, the stem-based morphology (e.g. Ser. v. *pev-a-ti* 'to sing' > n. *pev-ač* 'singer') is therefore taken to be the less natural option. Consequently, a root is a part of a word without all affixes and the corresponding root-based morphology (e.g. Ser. v. *ljub-i-ti* 'to kiss' > *po-ljub-ac* 'kiss') is the least natural option among the previously two (i.e. word-based and stem-based).

- 5) The preference for biuniqueness is the most natural option between the other two, namely uniqueness and ambiguity, and is fulfilled if the given form always has one and the same meaning (and vice versa, i.e. the relation between them is always one-to-one). As pointed out by Dressler (2005), this preference originates in a cognitive factor, namely in the parsimony of storage. This preference usually holds in agglutinating languages, whereas in inflecting ones the less natural and preferred relations are more frequently present, namely uniqueness (one-to-many) and ambiguity (many-to-many) relations (cf. Dressler, 2005). In Turkish for example, plurality is expressed only via the *-ler* suffix, and the suffix *-ler* in Turkish morphology expresses only plurality and has no other meanings. But, as already mentioned, this ideal is not always achieved in inflecting languages, where very often one suffix has more than one meaning (e.g. *-ica* suffix in Serbian for 'female person', e.g. *radnica* '(female) worker' and a suffix for diminutives e.g. *lopta* 'ball'- *lopt-ica* 'ball-DIM'), or one meaning may be expressed by more than one suffix (e.g. for 'female person' there are numerous suffixes: *-lja*, *ulja*, *ara*, *-ka*, *-ica*, etc.). In word formation, this preference holds usually only for terminological terms.

- 6) The figure ground preference may be explained in terms of the tendency for subordination relation of a non-head (i.e. ground) to a head (i.e. figure) or in other terms, between the most important and less important parts of a word, especially for compounding. Therefore it may be said that subordinate compounds are more natural on this parameter than coordinate compounds, whose both head and non-head are of equal status (e.g. *speaker-hearer*). However, in the majority of languages, the general tendency has inverse morphological order, namely head is preferred on the right side, which is known as Williams' (1981) right-head-hand rule (shortly RHH rule). This explains also universal preference for suffixation to prefixation.
- 7) Preference for binary relations is found crosslinguistically as a preferred, more common and more natural grammatical option. This preference is derived from Pierce (1965). Examples of ternary or other relations may be very often subdivided into 2 binary relations or intermediate units before arriving to binary formations. Therefore, the most natural relation is one base plus one element attached to it, e.g. one word is preferred to be formed by one base plus one inflectional or derivational affix.
- 8) Optimal shape of units is a preference for one grammatical morpheme (free or bound) to consist of one syllable and for one lexical word to consist of one foot (i.e. bisyllabic foot, due to binarity preference, cf. Dressler, 2012). Thus, for example, affixes are prototypically monosyllabic, such as for example in Serbian *-ak*, *-ić* or English *-ly*, *-ness*, etc. There are also bisyllabic suffixes (Serbian *-ica*, *-ota*; English *-ery*, *-ation*) and some rare examples of trisyllabic suffixes (Serbian *-etina* for pejoratives).

To sum up, all of these preferences on the above explained parameters are expected to be found cross-linguistically, with more natural processes to be found more frequently than less natural ones on the same parameter. These predictions are then expected to be confirmed in external evidence, such as diachronic change or first language acquisition. More precisely speaking, natural morphological operations should be more stable diachronically than their less natural counterparts on the parameter under consideration. Moreover, cases of morphological change are expected to be directed towards the most preferred and the most natural ones. Universal preferences for certain options are even more easily investigated in the process of first language acquisition, because children are expected to first acquire and use the most natural forms and morphological rules. However, it may also happen that certain predictions turn out to be false crosslinguistically, which means that there may be present certain naturalness conflicts between these universal preferences within one or more grammatical components (e.g. conflicts between morphology and phonology). However, second subtheory of NM, i.e. typological adequacy, turns out to be

powerful enough to solve such inconsistencies as well as to regulate levels of universal parameters based on typological properties of languages.

1.2. Second subtheory- Typological adequacy

The subtheory of typological adequacy was established by Wolfgang U. Dressler in 1985. It was influenced by Skalička's theory (1979) of ideal language types and was studied within NM as 'sets of consistent responses to naturalness conflicts' (cf. Dressler, 2005). Generally speaking, one language type is natural on some parameters, but not on others, because it is not possible for one language to be equally natural on all parameters described in the previous section. I will only briefly give the most important characteristics of some languages belonging to certain language types.

For example, isolating languages (e.g. Korean) have more extragrammatical than grammatical formations (e.g. almost no inflection). The main characteristic of these languages is the preference for monosyllabic words. Interestingly, also English shows some isolating properties, especially in inflecting morphology, as well as greater preference for monosyllabic words, and very unnatural values on the preference on indexicality (e.g. conversions are very common morphological process). Romance languages (Spanish, Italian and Spanish) present more isolating properties than German.

Inflecting-fusional languages (e.g. Serbian) have the most natural options on binarity, optimal shape, figure to ground and indexicality preference and less natural options on constructional iconicity, transparency and biuniqueness. For example, the ambiguity is very high, i.e. it is often present a high level of homonymy, synonymy, polysemy, etc. For example, English Latinate derivatives belong to the inflecting-fusional type, because of the lower transparency and iconicity. Serbian morphology is a typical representative of this language type.

On the other hand, agglutinating languages (e.g. Turkish) have most natural values on transparency (both morphotactic and morphosemantic), on constructional iconicity and on parameter of biuniqueness, and less natural values on binarity, optimal shape and indexicality. This means that such languages have completely the opposite picture of naturalness degrees on given parameters than inflecting languages. More precisely, words in agglutinating languages are usually longer than 'usual', which is actually less natural option on the parameter of binarity and indexicality. Thus, it can be concluded that agglutinating languages' main typological characteristics are greater preference for iconicity and

transparency. The Germanic stratum of English derivational morphology is said to be more agglutinating in its nature due to its greater preference for iconicity and transparency.

Introflexing languages (e.g. Semitic languages) have for example less natural values on morphosemantic transparency than inflecting languages. The preferred base is a stem and there are discontinuous roots. In such languages ambiguity is also very high, especially synonymy and allomorphy.

Polysynthetic-incorporating languages (e.g. Inuktitut) have high morphosemantic transparency as well as greater constructional iconicity. Interestingly, English has some properties that are very common for these languages, such as for example the possibility for noun incorporation (e.g. *to dish-wash*) (cf. Dressler, 2005).

To sum up, it is evident that morphological properties of languages all over the world may approach more than one ideal language type, as for example English, because it shows properties of four language types. Dressler (2005) argues for this typological naturalness to be rather relational, because it is able to connect various universal naturalness parameters with various language components. Thus, within the second subtheory of Natural Morphology, even unnatural values on universal parameters may be adequate for the given language from the typological point of view. However, if typological subtheory has the function of a filter of universal markedness subtheory, than the third subtheory in the framework of Natural Morphology functions exactly in a same way, adapting typological properties and degrees of naturalness on given universal parameters to the language-specific properties (Dressler, 2012).

1.3. Third subtheory- Language specific system adequacy

The subtheory of language- specific system adequacy or system-dependent naturalness was proposed in 1984 by Wolfgang U. Wurzel. It deals with language-specific morphological system. Its goal is to explain what is normal or system-adequate within the morphology of a given language. The most important concepts are productivity, default and morphological classes (Dressler, 2003).

Mayerthaler (1981) defined productivity as a result of a naturalness phenomenon. Considering all previously explained 'natural' parameters, it is expected that, for example, more constructionally iconic or more transparent forms should be more natural than the others. Because of that reason, among many word-formation processes, affixation (e.g. Eng. *popular* > *popular-ity*) is more productive than the internal modification (e.g. Eng. *sing* > *song*). In cases of competing properties, the most dominant is usually the most adequate one (Dressler, 2005). For example, in English derivation, the two competing suffixes, *-ness* and –

ity are distributed according to the Latinate origin of bases to which these two suffixes are attached. More precisely, *-ity* is usually reserved for Latinate bases, whereas *-ness* for non Latinate ones. However, there is also a possibility for *-ness* to be attached to Latinate bases, which makes the *-ness* suffixation the dominant one. And this 'dominance' must be explained and justified by powerful reasons and facts, namely productivity. Thus, it is said that productivity is actually this most important aspect of system dominance (Dressler, 2003; 2005).

Productivity within the framework of Natural Morphology (cf. section 2.2.2) is a gradual process and it can be measured according to several criteria that will be presented in sections 4 for inflection and in section 6 for derivation, with examples from Serbian (Slavic language), which is a typical representative of highly inflecting languages. Shortly said, the most important criterion for full morphological productivity is the integration of foreign words with unfitting properties. These unfitting properties need to be adapted to the system of target language, showing the same inflectional properties as other indigenous words. A similar situation happens in word formation, where the high productivity of word formation rules is powerful enough to eliminate such unfitting properties and to adapt them into indigenous system of a given language (cf. Dressler, 2005). As already mentioned above, more detailed classification of productive inflectional and derivational patterns in the Serbian language with respective examples of integration of loan words into its system will be studied within this Master Thesis.

1.4. Conclusion

To conclude, it is clear how the three subtheories of Natural Morphology interact, starting from universal notions, across typological and finally language-specific properties. Each lower level actually elaborates the previous one, resolving inconsistencies and fitting language specific properties to corresponding typological and universal ones.

This order of morphological properties, namely universal-typological-language specific is confirmed in first language acquisition, because it is found that children in their earliest phase produce many extragrammatical formations, reduplications and echo-words. After it, they start to be aware of typological or language specific properties (Dressler, 2005; 2012).

Productivity degrees of morphological phenomena in a given language may perfectly be studied within Natural Morphology framework, because it gives different degrees of naturalness on various preferences, combining it with universal, typological and language specific options on naturalness preferences. For a confirmation of above explained assumption, reliable proofs are needed. These may be found in linguistic and extralinguistic

domains, such as for example in the process of integration of loan words into indigenous system of the target language, in diachronic change, in first language acquisition or in psycholinguistic evidence. All these methods are extremely potent confirmation for the naturalness phenomena and its parts, such as for example productivity.

Productivity has been studied by lots of morphologists for years and there is a variety of different approaches and views proposed in the literature. The most important theories will be present in more detail in section 2 as follows.

2. Productivity

"Productivity is the ability to form new potential words."

(Laaha et al., 2006: 279)

2.1. Introduction

The term 'productivity' is one of the most studied concepts in morphology. Lots of morphologists have tried to understand it and define it precisely. Therefore, there are lots of proposed definitions and views on this notion. Intuitively speaking, productivity refers to the possibility that speakers have to form new words which follow certain conditions imposed by language norms. Furthermore, people know that some patterns are used rather than others, i.e. that some morphological processes² are more common or regular than others. It means that more frequent patterns are understood as more productive, whereas the less frequent ones are said to be less productive. However, these terms 'productive' and 'productivity' cannot be so simple defined only in terms of frequency or regularity. Instead, there are many more factors that should be taken into consideration when trying to identify which are the most productive inflectional classes or morphological processes in a given language. As already explained, lots of linguists have devoted the great part of their work to the study of productivity and to the establishing of criteria for a precise defining and measuring of this phenomenon. In this section I will present the most influential views and theories (both qualitative and quantitative) about the productivity. Moreover, I will provide some psycholinguistic explanations of this concept.

2.2. What is productivity? - Qualitative approaches

2.2.1. Earlier theories on productivity

In the early twentieth century, the notions of 'productive' and 'productivity' have always been mentioned in the linguistic literature, although not always precisely and consistently (Bauer, 2005). Productivity was almost always connected to historical studies of the English language. For example Kruisinga (1932) makes the difference between 'living' and 'dead', i.e. according to his view, those living are productive, whereas the dead ones are unproductive and should be studied only within the historical grammar.

² The term 'morphological process' here is used as a general term that refers to both concatenative (e.g. affixation, compounding) and non-concatenative processes (e.g. conversion, back-formation, etc.) in both inflection and word formation.

After this first ‘historical’ approach to the study of productivity, in the mid- ‘90s lots of morphologists have contributed to the better understanding of this notion. As already mentioned previously, the term ‘productive’ is not easily definable. Thus, there are different theories and explanations of the productivity, which demonstrates us how complex this whole concept really is. Among them, one of the most influential definitions was proposed by Schultink (1961; 113).

“Onder productiviteit als morfologisch fenomeen verstaan we dan de voor taalgebruikers bestaande mogelijkheid door middel van het morfologisch procédé dat aan de vorm-betekeniscorrespondentie van sommige hun bekende woorden ten grondslag ligt, onopzettelijk een in principe niet telbaar aantal nieuwe formaties te vormen.”

(Schultink, 1961; 113)

“Productivity as morphological phenomenon is the possibility which language users have to form an in principle uncountable number of new words unintentionally, by means of a morphological process which is the basis of the form-meaning correspondence of some words they know”

(Translation taken over from Booij, 1977; 4)

It must be explained that the term ‘morphological processes’ is to be taken as a synonym for a Word Formation Rule (WFR) in definitions of other morphologists. The fact that he refers only to ‘unintentional’ coinage of new words may be interpreted as a little problem, since there are cases where the creation of new words happens intentionally, such as for example for poetic reasons (cf. Bauer, 2005). Moreover, as we will see in the further parts of this Thesis, productivity is present in many morphological operations, such as the integration of loan words into the system of a given language, because the adaptation and the integration of the foreignisms occur almost always following some kind of ‘a productive path’. However, Schultink’s definition can be considered as a classic one because it captures the essence of what this concept means, namely the ‘possibility for language-users to coin an infinite number of new formations’.

2.2.2. Productivity within NM framework- grammatical productivity

Schultink (1961) explains productivity in terms of the possibility of speakers to unintentionally create an unlimited number of word formations. As pointed out by some scholars, among whom Dressler (2007) and Bauer (2001) intentional creations should also be included. Put in other words, word formation productivity in this sense accounts for potential words, i.e. refers to language as potential system or in Chomskyan words (1986) to

internal language (Dressler, 2003). On the other hand, there is language as institutional set of norms which consists of actual and accepted words (cf. Dressler, 2007). This distinction between possible and actual words is one of the central concepts in morphology (Plag, 1999). More precisely, it concerns the separation between attested (i.e. actual) and non-attested but well-formed (i.e. possible/potential). In the framework of Natural Morphology the first level, i.e. the level of potential words is called dynamic morphology and contains productive word formation rules, categories and classes (Dressler, 2003; 2005). The level of actual words is called static morphology, containing lexicalized words stored in the lexicon.

Grammatical productivity is taken to be a constitutive property of dynamic morphology and thus located in the potential system of grammar (Dressler, 2003). We need high grammatical productivity on the level of potential system in order one word to pass on the level of the actual system. There is an overlap between the two morphologies (static and dynamic), i.e. between rule and storage mechanism. Frequency may influence such competition between the two morphologies in performance because the most frequently used productive words are often memorized in a whole. Similarly, unproductive but regular forms may be processed by rule mechanisms, in the same way as the productive ones. Thus, to conclude, grammatical productivity is intrinsic to the level of language as potential system and therefore to dynamic morphology. It is opposed to type frequency on the level of language as norms as well as to token frequency on the level of performance. On the level of norms, productivity equals to type frequency of actual words formed by means of productive rules. Various factors, such as pragmatic, sociolinguistic etc., influence the interaction between the productivity and type frequency on the level of performance, resulting in the token frequency of existing form patterns. Since grammatical productivity is a characteristic of the potential system of grammar, apart from morphological categories, morphological rules and paradigm classes, it also deals with the integration of loan and neologisms, class shift, conversion, etc.

Productivity has been investigated by lots of other morphologist and models as well. Therefore, in section 2 I will give the most important views on productivity and ways to measure it. After that overview of different approaches, I will study the phenomenon of productivity in more detail within the framework of third subtheory of Natural Morphology, namely language-specific system adequacy (section 4). I will use examples from one typical representative of highly inflecting languages-namely Serbian.

2.2.3. Productivity and the interaction with other factors

Bauer (2001, 2005) argues for a view on productivity as a notion that should be considered only together with numerous factors, such as regularity, transparency, frequency or naturalness and not as equivalent to each of them separately.

As for frequency, it must not be equaled to productivity, because there are morphological processes that are productive, although not very frequently used. As evidence, Bauer (2001) mentions the *a-* prefixation (e.g. *ablaze*). Moreover, there are frequent morphological processes that are almost never used in the formation of new words (e.g. English suffixation with *-ment*) and thus characterized as frequent but unproductive. Thus, such processes have a high type-frequency and are actually the result of past rather than present productivity (Bauer, 2001). In Dressler's terms it means that these processes have high type (level of actual words) or token frequency (level of performance), but low grammatical productivity. Furthermore, Aronoff (1976) argues that the productivity of morphological patterns should be considered as being influenced by certain base types and therefore the notions of productivity and type frequency must not be equated. For example, a certain affix chooses the 'suitable' base to be added to it, which means that no affix or WFRs morphological process is more productive in nature than any other affix or morphological process. He claims that productivity should be represented as a variable and can be different in different contexts that are influenced by the base form. For example, Aronoff argues that speakers always prefer some forms to others, depending on the base. Put another way, with the adjective base *ADJ_{-ive}* the preferred derived noun is *N_{-iveness}* rather than *N_{-ivity}*. On the other hand, there are also quite opposite views among different linguistic theories, according to which it is a base that selects a 'suitable' affix to be unified to it. For example, Plag (1999) defines the so-called 'output constraints' which take the well-formedness of the final word as the most important criterion in determining whether (and if yes-which) other processes may be applied on that output base. This means, that the well-formed base/output selects for the further processes or affixes (cf. also Williams' (1981) notion of 'potentiation'³).

There are some scholars who argue that higher transparency contributes to higher productivity of a pattern under consideration. For example, within natural morphology, it is expected that the more transparent patterns are more productive. Aronoff (1976) claims that, 'productivity goes hand in hand with semantic coherence'. However, Bauer (2005) argues against such a direct correlation between the two properties, with the example of the *-ment* suffix, which is transparent but unproductive. Similarly, not all productive patterns are

³ Williams uses this term for 'selectional' property of affixes, i.e. morphemes have the ability to select certain affixes. For example, the suffix *-ity* is selected by the suffix *-able*.

semantically transparent and coherent. Bauer (2005) explains it with the example of *-er* suffixation which is highly productive but not very semantically coherent. For example, the denotation of the word *choker* (a person, instrument or location) becomes clear only in the context.

As pointed out by Bauer (2001), the problem with the correct consideration of the regularity in the study of productivity is the fact that this term has lots of different meanings. For example, it may be equal to the term transparent, i.e. 'without morphophonemic irregularities of the form'. Others connect the term 'regular' to the notion of 'majority' pattern and 'irregular' to the 'minority pattern'. For such authors, the majority pattern is the only regular one (e.g. *-s* plural in English) and the regularity in this sense equal to productivity. However, examples from various languages contradict this assumption because the majority rule is not always the (only) productive one, but there are also minority patterns that are productive (the *-s* plural in Dutch). This term may be defined even more simply, in terms of the homogeneity of both input and output of a word under consideration (Dressler, 2003). In this light, these two concepts must not be equated, since there are also regular but unproductive patterns.

Within the theory of Natural Morphology, naturalness is the core concept (Mayerthaler, 1981). It is a function of various interrelated notions (e.g. markedness, transparency, compositionality, etc). Productivity within this model derives from various factors, among which there is naturalness as well. All these make the concept of productivity a very complex one, with numerous of factors that influence it. For more on productivity and naturalness see section 2.2.2 of this Thesis. Bauer (2005) claims that naturalness cannot be totally equated with the notion of productivity because it is found that even not very 'natural' patterns may be productive. According to him, the way in which productivity is derived from naturalness is unclear.

The default pattern has often been mentioned in the linguistic literature. For example, the default may be simply described as 'widest possible generalization' (Bauer, 2001). Zwicky (1989) defines default as 'general, predominant, and productive'. However, not all productive patterns are necessarily at the same time defaults. For example, there are 7 different ways for plural formation in German. The *-s* plural is very widely used nowadays, especially with loan words, abbreviations and onomatopoetic forms. However, this is not the most common and the only productive one in German, but there are other commonly used patterns depending on the gender of the base, such as *-en* plural for feminine nouns. Thus, even though by definition, the default should be 'productive and predominant', it is not always the case, as shown by German examples.

2.2.4. Productivity vs. creativity

Moreover, creativity is mentioned often with regard to the notion of productivity. There are various approaches to the study of creativity. The concept of creativity should be distinguished from productivity, even though for some linguists these two terms may be synonymous. Bauer (2001, 2005) argues that both productivity and creativity are hyponyms of 'innovation', with one difference between them, namely rule-governedness. Creativity according to him may be defined as 'non-productive innovation', i.e. it refers to more deliberate non-rule governed coinage. This is in line with some authors (Aronoff, 1976; Mayerthaler, 1981) who exclude some patterns (e.g. blends, acronyms, back-formations, etc.) from the area of word formation and productivity. Such an idea may be understood as very similar to the Schultink's view (1961) that unintentional coinage is the only that matters for the study of productivity. However, these extreme assumptions are not widely accepted among scholars and lots of them, for example Dressler (2007) and Bauer (2005) consider such intentional coinage (e.g. formation of loan words) to represent relevant evidence for the study of productivity. Thus, conscious coinage need not be excluded from the study about productivity in morphology. However, Bauer (2001) proposes a list of possible cases when loan words do not necessarily show productivity of a pattern under consideration. This list includes words occurring only in poetic texts, only in newspaper headlines, only in the production of a single person, only in playful formation, new terminology or a single new word.

Van Marle (1985) has a really controversial proposal about the productivity, since he literally accepted the Schultink's view. In other words, Van Marle (1985) argues for the productivity only in terms of the 'unintentional coinage'. According to him, non-native bases and non-native formation processes, such as for example non-native affixation in English (e.g. *pre-*, *post-*, *in-* or *-ize*, *-ment*, *-ous*, etc.) are not unintentional, and, thus, unproductive by definition. Consequently, this assumption that such intentional formations are not productive due to their 'intentionality' is rather contradictory to almost all other views present in the morphological literature.

Dressler (2007) investigates one of the processes where the level of awareness is very high, i.e. creativity in poetic license, in order to find out if there is some relevant attestation for the study on morphological productivity. Originally, poetic license refers to the liberty that a poet or a writer has to use the language deviating from prescribed norms if justified by literary purpose. It means that even 'errors' that don't respect norms of word formation may be allowed in their production. Such cases of so-called 'rule-violating creativity' regarding the productivity have been the subject of study in Dressler & Ladanyi (2000a). Newly coined and used words should serve the purpose of fiction and therefore

writers should be considered to possess the high competence in the potentiality of word formation rules of a given language. These formations may violate more or less morphological norms. This violation of the rules is connected to the degree of productivity of these WFRs. If productive rules are used for coinage of such neologisms, the violation of that rules are smaller. Moreover, it is very difficult for native speakers to evaluate their existence or not in a given language. On the other hand, if the underlying WFR is unproductive, the new word is much easier recognizable. Dressler (2007) proposes a list of some predictions based on the correlation between the degrees of productivity of WFRs used for the creation of neologisms. For example, a poetic occasionalism is considered to be more 'audacious' if coined by means of an unproductive WFR. Also, the number of such 'unproductive' neologisms is smaller than the number of those created by more productive WFRs. Analyzing examples in selected German and Austrian writers, Dressler (2007) found numerous examples that confirmed his predictions about the grammatical productivity in poetic license. It may be concluded that most of intentional poetic neologisms are created by means of productive rules, following the scale of productivity (section 6.1.2. of this Thesis). Only the minority of them break WFRs. Thus, theories about unintentional word formation and the scales of productivity are also confirmed on the example of one of the most 'aware' word formation type, namely poetic license.

2.2.5. Productivity on the level of norms

In the linguistic literature on productivity, very often we find the dichotomy between availability and profitability. The original terminology comes from Corbin (1987) and her distinction between *disponibilité* and *rentabilité*. The translations of these terms in English, namely availability and profitability respectively, are proposed by Carstairs-McCarthy (1992). One morphological process is defined as disponible/available if speakers are able to widely use it in the production of new words and neologisms. On the other hand, a morphological process is rentable/profitable if it is actually used in production of new words. One example for such distinction is given by Bauer (2005) who says that the English non-negative prefix *a-* is available but has never been profitable and that therefore the number of new words formed by means of that prefix is very small. An alternative terminology is proposed by Kastovsky (1986) who argued the distinction between 'rule scope' (paralleled to availability) and 'application rate' (paralleled to profitability). Thus, rule scope or availability is to be seen as the matter of competence whereas the application rate or profitability is something that refers to the actual number of a given pattern in performance.

Productivity on the level of norms concerns the type frequency of newly coined words (neologisms) that respect the norms of a given language and its speech community (Dressler, 2007). It corresponds to the above mentioned notion of profitability proposed by Corbin (1987). The high productivity on this level is beyond the grammatical productivity on the level of the potential system. For example, within English denominal verb formation this productivity is the highest for conversion, and next for *-ize* suffixation (Plag, 1999). Thus, it may be concluded that the profitability of WFRs may be influenced by some linguistic (e.g. structural restrictions) or non-linguistic factors (e.g. pragmatic factors).

For example, there are certain domains in which some blocking rules (cf. van Marle, 1985; Bauer, 2005) are applied. Plag (1999; 45) argues that such structural restrictions are among those factors that influence the productivity and gives an overview of the most important general restrictions found in the literature, which is given below (1-10):

- 1) the word base hypothesis
- 2) the compositionality hypothesis
- 3) the binary branching hypothesis
- 4) locality conditions
- 5) recursion and repetition constraints
- 6) the open-class base hypothesis
- 7) the unitary base hypothesis
- 8) the unitary output hypothesis
- 9) blocking
- 10) stratal constraints.

For example, productivity as a structural property of a WFR depends very much on the restrictions imposed on the basis or on the derivatives. These restrictions are very common in the literature, such as for example the rule which says that the Serbian adjectival suffix *-ast* is added only to color adjectives. Nevertheless, these structural restrictions on productivity are rather taken to be restrictions on rule application (Dressler, 2007). Similarly, the application rate is not easily predictable and very often depends on some extra-linguistics factors, i.e. in terms of speakers' usage of certain WFRs in order to coin new words in a given language. Plag (1999; 37) uses the English verbal suffixation *-en* (intensionally-defined category) because it is a very good example of a well-defined process (morphologically, semantically and phonologically) that is practically dead. It shows us that the non-applicability of one process can't be deduced from the structural properties of the rule.

Thus, the application rate of WFRs should be accounted for also in terms of other influencing factors, such as various pragmatic factors. First of all, 'fashion' may be a very obvious extra-linguistic factor that makes certain words or grammatical categories more or less 'desirable' to use. Another pragmatic factor refers to the relation between linguistic norms and societal needs (Dressler & Ladányi, 2000a), i.e. a need for new words or

categories. The most important function that comes into question with societal needs is the function of words for labeling new concepts—concept formation. Another function of such new coinages may be the satisfaction of stylistic reasons, in terms of Kastovsky's (1986) 'recategorization' function. This discourse function (the condensation of information, Plag, 1999; 39) is very frequent in the spoken language and therefore tends to have a high applicability. Furthermore, Plag (1999) argues for so-called 'attitudinal function' or 'emotional attitude' (Dressler & Merlini Barbaresi, 1994), which is very important for the evaluative affixes. The term 'attitudinal' means that it expresses the attitudes of speakers when using evaluative affixes with non-common categories (e.g. when adding a diminutive suffix to a proper name: Ser. *Tijana* (proper name)-*Tijan-ica* 'Tijana-DIM').

The pragmatic need is very important, because, as we may conclude from previous factors, it may influence the usage of certain categories and the level of their productivity. In other words, the great pragmatic need of a certain category is directly proportional to their great productivity on the level of norms. For example, diminutives have the greater pragmatic need than augmentatives (Dressler & Merlini Barbaresi, 1994) which makes them to be more productive on the level of norms, i.e. there are more diminutives than augmentative neologisms. Moreover, this fact will influence the productive WFRs, namely there are more productive diminutive rules than the augmentative ones, which is confirmed by many languages, such as Serbian, Italian, etc. There are languages that do not possess augmentatives at all (e.g. English). Thus, a cross-linguistic conclusion can be made, namely if one language has augmentative formation, it will also have diminutive formation, but it is not true vice versa, as confirmed by some psycholinguistic studies (Dressler & Merlini Barbaresi, 1994).

Hence, we may conclude that the probability of new formations is influenced by a variety of factors and the simple counting of neologisms in a given point of time should be rather taken as a superficial approach to the study of productivity. Therefore, new approaches were invented, in order to provide for more precise measures for productivity and productive patterns. An overview of the most successful ways for measuring productivity will be given in the following section.

2.3. How to measure productivity? - Quantitative approaches

In the linguistic literature, there are scholars who were more interested in establishing successful ways for measuring productivity than in trying to give a valid and generally accepted definition of this notion. Such approaches to the study of productivity are commonly known as quantitative approaches. However, in order to measure it, a clear idea about the nature of the terms 'productive' and 'productivity' should exist.

The central view of quantitative approaches has been the idea that the productivity of a given affix can be explained in terms of "the number of attested types with that affix at a given point of time" (cf. Plag, 1999). Aronoff (1976) argues that the measuring of productivity only in terms of attested type frequency is 'unfair' because there are lots of restrictions on the word bases that can influence the application of certain processes. Moreover, lots of linguists criticized the validity of this criterion as the only sufficient one for defining productivity, because such a definition takes into consideration only the 'actual' words without considering so-called 'possible' (or 'potential') words, which should be considered as a crucial point of the study on productivity (Bauer, 2001). In fact, in modern morphology, lots of scholars were occupied only with actual words or with actual but impossible words⁴, whereas the factor of possible words was mainly ignored by many of them. However, it is very possible and often cross-linguistically attested that a given language may have lots of words having the same affix (actual words), but the same affix will not be used very often by language users in the formation of the new words (potential or possible words). On the other hand, there are other polemic views, such as the one proposed by Lieber (1980) which defined the productive affix only in terms of potential words, with no reference to the actual ones. It seems that for a precise definition, both actual and potential words should be accounted for, in order to avoid inconsistencies.

2.3.1. Aronoff's (1976) productivity index

Aronoff (1976) defines productivity taking into consideration both actual and possible words, i.e. by means of the so-called productivity index. This index is described as the ratio of actual to possible words and is formalized as $I = V/S$, where V represents the number of actual types and S is the number of possible words formed by the same morphological process (Baayen & Lieber, 1991). It means that the higher the ratio - the greater the productivity. However, his proposal presents many weaknesses in such a calculation (Plag,

⁴ These actual but impossible words are also known as 'lexicalized' words. Simply speaking, they are attested, but cannot be created in the present state of a given language system (cf. Bauer, 1983; Plag, 1999).

1999). The problem lies in the fact that it is not always possible to determine when one possible word passes into the category of actual words and the majority of them are not listed in the dictionaries. Therefore, the dictionary-based calculation doesn't give an accurate measure of the most productive patterns, due to the fact that the outputs of the most productive morphological processes are likely not to be listed in dictionaries (Aronoff, 1976). However, dictionaries are much more accurate in providing the information about the morphological processes and patterns that are not productive anymore (Plag, 1999) or about past productivity (Bauer, 2001). He argues that the database of the OED (The Oxford English Dictionary) may be sufficient for the investigation of morphological processes in various historical periods.

A further unresolved question in such views is actually the imprecise nature of the term 'possible word'. Bauer (2001) conducted a small experiment in order to rate several possible nominalizations of color adjectives by using the suffix *-ness*. Such an experiment was indeed aimed at investigating the reason for people's different attitude towards some nominalizations (e.g. *whiteness* vs. *purpleness*). Matthews (1974) first talked about that in terms of the semi-productivity of the *-ness* suffix. Bauer (1983) argues for a familiarity reason in making such differences, but later, in Bauer (2001) he presents the results of his two-year-experiment with English native speakers, giving us the strong evidence that there are several interacting criteria that influence the degree of productivity of certain nominalizations. Such criteria include the familiarity of the base color-term, the etymology of the base color-term, the length of the base color-term (monosyllabic, disyllabic, etc.) or the status of the base color-term (monomorphemic or derived). All these results suggest that the properties of the bases do have a great influence in determining differences among similar possible words, as already shown on the example of the nominalizations of the color terms. Also, this Bauer's (2001) experiment is an evidence for the complex status of 'possible' words and the need for a complex view on constraints on the bases. It seems to me that the notion of a 'possible' word remains still an insufficiently explored area, whose status is difficult to define using one simple definition. The only fully true conclusion to be made about possible words is the fact that one must consider a variety of factors (or base properties) connected to the properties of certain formation types in order to determine more precisely what a possible word is or may be.

Now, even if we manage to find out which words and formations are possible, another problem arises immediately. It is the inability of those possible words to be counted, since they are, by definition, 'in principle uncountable'. In order to solve this problem of the precise calculation of possible words, Baayen (1989; 1993) suggested the so-called 'potentiality of a given rule' (I) should be defined as the quotient of the number of possible words (S) and the number of actual words (V) with a given affix. This is actually the reverse of Aranoff's

productivity index. Thus, by means of some statistical models (e.g. Zipf's law), it is possible to estimate the number of potential forms with a given affix, based on the frequency distributions of the attested forms in a sufficiently large corpus. However, even this model presents some weaknesses, such as the fact that all very productive patterns should have the infinite number of possible words (S). But, as Baayen (1992) himself admits, it is not always as his potentiality index predicts, because there are some productive patterns (e.g. diminutive suffix *-tje* in Dutch) that have infinite value of S, whereas other productive patterns (e.g. suffixes for abstract noun formation *-sel* or *-heid* in Dutch) have finite ones. Because of that reason, Baayen (1992) argues that this potentiality index *I* is to be considered as a 'pragmatic potentiality', because influenced by lots of pragmatic factors as well. In other words, it is a measure of the degree of exhaustion of a productive process, rather than a measure of productivity itself. Thus, according to Baayen (1992) different degrees of productivity among morphological processes are due to the fact that, beside linguistic factors (e.g. transparency, frequency, etc), pragmatic factors (e.g. register, written/spoken language, etc.) should be calculated as well. However, since pragmatic factors tell more about the probability of new formations than about the productivity itself, new methods need to be found in order to measure productivity in word formation.

2.3.2. Baayen's (& Lieber, 1991; 1992) productivity measures

Different methods have been used for measuring the degree of productivity so far. One of the most cited ones was conducted in the study of Baayen & Lieber (1991) and it was created as a statistical measure conducted on text corpora. As already pointed out by Aronoff (1976), dictionaries are not very trustworthy fount of productive morphological processes, especially of the most productive ones. Baayen & Renouf (1996) explain this assumption using the example of the *-ly* adverbial suffixation in English, saying that there are only few newly formed words in neologism dictionaries; real usage is greater, as shown in a corpus. Because of that reason, Baayen's attempt to measure the productivity is based on the large language corpora, i.e. on the large amount of computerized words and texts, for example Dutch Eindhoven Corpus (600 000 words) or British National Corpus (100 million words). Nevertheless, also a very huge corpus (e.g. of approximately 20 million words) is only a sample of the given language and is unlikely to contain all words with all affixes. According to him, one of the possible ways for measuring productivity in a given language may be found in the number of new words that occur only once in the corpus and that are known as *hapax legomena* (abbr. *hapaxes*). Baayen (1992) argues that the number of

hapaxes shows how often a certain suffix is used in creating of previously unattested new words. According to him, such words are only rare words rather than neologisms. Hapaxes are mostly found in poetic texts, i.e. majority of them are poetic occasionalisms. Baayen & Lieber (1991) proposed two different terms for measuring the productivity, namely 'productivity in the narrow sense (P)' and the 'global productivity (P^*)'.

According to this view, the P productivity is a productivity of a particular morphological process in one corpus. It is defined as the quotient of the number of hapaxes formed with a morphological process under consideration (n_1) and the total number of all tokens formed by the same process (N). It can be represented as: $P = n_1/N$ (Baayen, 1992). Baayen and Lieber (1991) explained that P expresses the probability of appearance of new types when N tokens has been observed and sampled. It means that, if both the number of existing words with a given affix as well as the number of new formations with the same affix is low, that we should find the majority of those existing words within a sufficiently large corpus. On the other hand, if a given affix is used very much for making new words, consequently it is expected to find many existing words with the same affix, as well as more hapaxes of the same type. Thus, in this model, hapaxes have the central role in providing the rate of new formations in a given language. Lots of hapaxes formed with the same affix increase the productivity level of that process. Instead of Aronoff's (1976) calculation with possible and actual words, Baayen (1992) used hapaxes and types in the corpus, respectively. Such measurement may be used for a comparative investigation of different morphological processes and the degrees of their productivity within the same corpus. But, it is not possible to compare levels of productivity of a given morphological process among different corpora. Other problems are also present within this attempt, such as for example the condition 'formed with the same affix/process' (Plag, 1999). It is not always easy to distinguish for all words whether the affix under consideration is the same one, due to lexicalization or different kinds of idiosyncrasies (e.g. *-ity* in opacity vs. celebrity; cf. Plag, 1999). Moreover, high frequency means high value N that consequently diminishes the result P , i.e. the productivity is lower. Also various examples show really unexpected and untrue results (e.g. for *-erd* suffix in Dutch has the highest P ; cf. Baayen, 1992; Plag, 1999).

Because of all these contradictory results, Baayen (1993) revised this measurement by introducing some changes into the calculation. This new index is labeled as 'global productivity' (P^*) and it should give us the possibility for the study of the productivity of morphological processes by comparing them among different corpora. This P^* is defined as the 'hapax-conditioned degree of productivity' and may be mathematically represented as follows:

$$P^* = \frac{n_{1,E,t}}{h_t}$$

In this measure, E represents the morphological category, t represents the number of tokens, h_t is the total number of all hapaxes in a given corpus. Considering this definition (P^*), it is clear that the idea here is to find out the rate of hapaxes formed by a given morphological process in a given corpus. In other words, it shows the level to which certain morphological processes contribute to the expansion of vocabulary (Plag, 1999). In contrast, the above explained productivity in the narrow sense (P) is aimed at investigating ‘how frequently the words we meet in a particular morphological category are new words’ (cf. Bauer, 2005).

Many linguists have tried to explain the relevance of hapaxes on productivity, such as for example Chitashvili & Baayen (1993). Their crucial hypothesis is that the number of hapaxes belonging to the same morphological category corresponds to the number of neologisms of the same category. Thus, they demonstrate that hapaxes may be considered as an ‘indicator’ of productivity (Plag, 1999; 28). However, these measurements that are based on the occurrence of hapaxes are not clearly investigated and there are various interpretations on that (e.g. Dressler, 2007; Plag, 1999, Bauer, 2001). In short, an unanswered question still remains i.e. how much such ‘opaque forms of various types’ (Dressler, 2007) are indeed reliable for the study of productivity.

The above explained quantitative approaches were tested mainly on English word formation with only few investigations conducted on other languages. Some of them are the studies done by Gaeta & Ricca (2003, 2006), who wanted to check the validity of Baayen’s measure on Italian word formation. They confirm one of the main objections on Baayen’s approach, namely the fact that the productivity measure P ($P=n1/N$) gives valid results only if the rate is compared across affixes with the same values of N (total number of tokens with a given affix). In fact, the main weakness of Baayen’s model is exactly this kind of comparison among affixes with distinct token frequencies. Therefore, the so-called ‘variable-corpus’ approach proposed by Gaeta & Ricca (2006) may balance the weight of high token frequencies and high number of hapaxes, by taking data from corpora of correspondingly different sizes. This method gives useful results also for measuring productivity in inflection, comparing inflectional suffixes for equal values of N .

In summary, it seems that no measure is totally accurate and a variety of factors and conditions influence productivity. Even the most productive patterns may be dependent on certain structural restrictions, as well as on other extra-linguistic factors.

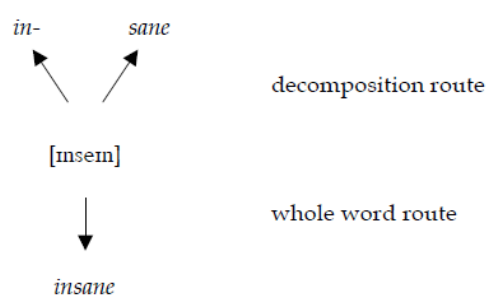
2.4. Productivity within psycholinguistic models

Productivity is a concept that is very important for the investigation of the mental lexicon in psycholinguistics. Findings from psycholinguistic investigations may provide some significant evidence for the conclusions made within both qualitative and quantitative approaches. For example, psycholinguistic research tries to find out the relation between productivity and other factors or to justify the preference speakers' for one affix instead for other one in the coinage of new words. In the recent models of morphological processing, it is argued that the access to words in the mental lexicon may work in three different 'routes'.

1) The 'whole-word route' or 'full listing hypothesis': According to this view, words are processed and retrieved as a unit, as a whole word, i.e. the access to words is direct.

2) The 'decomposition route' or 'full parsing hypothesis' favors the fully compositional storage and retrieval of derived or complex forms in our mental lexicon.

A graphical representation of the two routes is given below in picture 1:



Picture 1: Decomposition vs. whole-word route (Plag, 2004)

There is also a third possible way for the morphological processing of morphologically complex words, namely the so-called dual route hypothesis.

3) 'Dual route' hypothesis: There are several variants of this view which can be understood as a compromise between the other two hypothesis. For example, dual-route theories assume that a complex word can be either stored as a whole or be decomposed into its morphological constituents. This theory raises several questions about what sort of complex words are preferentially used via one route rather than the other. For example, it is often taken that very frequently used items and also opaque items would be stored and processed more efficiently in their full form. On the contrary, less frequent items and more transparent forms would be subject to decomposition.

Some psycholinguistic models look on a mental lexicon as a symbolic formation of rules (e.g. Clahsen et al., 2003). Dressler (2007) points out that in such models productivity

should be taken as the most important reason for computation by rules, i.e. for (de)composition. On the other hand, unproductive patterns are not suitable for being modeled by rules, but are rather considered to belong to the whole-word storage. Some dual route models propose a complementary distribution between decomposition and lexical access to stored lexicon. In some so called 'race' models (e.g. Baayen & Schreuder, 1991) where two possible theories (i.e. decompositional and whole-word storage) overlap, high productivity plays an important role in favoring the decomposition. Rule models claim that not only transparent word formation rules are subject to decompositional processes, but also patterns that show morphonological alternations (e.g. palatalization [k]: [tʃ] in: *ruka* 'hand' > *ruč-etina* 'hand-AUG').

Very often, it is the frequency of morphological patterns to be taken as the most relevant criterion in deciding about their productivity (cf. Plag, 1999). This idea lies in some psycholinguistic findings that show that frequency influences the way of morphological processing of complex words. For example, Hay (2000, 2001) argues for the relative frequency, which is a ratio of the derived word frequency and base frequency, to influence the morphological processing. When the base is more frequent than the output word, the relative frequency is smaller and the decomposition route is activated (e.g. the word *blueness* is less frequent than its base *blue*). These affixes are taken to be productive. On the other hand, in the cases when a derivative is more frequent than its base, the relative frequency is higher and the whole-word route is activated (e.g. the word *business* is more frequent than its base *busy*). Thus, the higher the frequency of the base, the more likely is the decomposition route. According to Hay's view, low relative frequency is related to the high productivity (Plag, 2004; Dressler, 2007). Consequently, higher frequency of bases, i.e. lower frequency of derivatives, signals the low relative frequency i.e. higher productivity. This finding is consistent with assumptions that productive morphological processes usually have more low frequency words, which in corpus-based studies results in more hapaxes. Less productive processes are more likely to be found on formations with higher relative frequency. However, some views have shown that the high type frequency of words formed by means of certain patterns of morphological rules may be a result of 'an historic accident' (cf. Bauer, 2001). Marchand (1960) made the difference between the frequency regarding the traditionally accepted word formations, i.e. so-called word-formedness and the synchronic study regarding active productive word formation. This view has directly influenced Schultink (1961) and Aronoff (1976) who argue that productivity represents the property of a productive word formation rule to form an infinite number of potential words.

In psycholinguistic research there are studies that were aimed at the investigation of productivity from the point of view of morphotactic and morphosemantic transparency and that the degree of transparency of a given WFR influences their productive use. But, there

are also highly transparent (morphotactic, morphosemantic or both at the same time) unproductive rules, which makes this connection (transparency-productivity) to be possible in the reverse direction- from productivity to transparency (cf. Dressler, 2007): the higher productivity of one WFR, the higher transparency of the words formed by means of that rules. Dressler & Merlini Barbaresi (1994) explained this assumption with the fact that neologisms are usually more transparent than the older derivatives.

In Hay's approach, the above explained reciprocity between low relative frequency-high productivity-decomposition (parsing or rule application) is correlated also with high level of morphosemantic (or semantic) transparency. On the other hand, there is the correlation between high relative frequency, lower productivity, whole word storage and lower morphosemantic transparency. Hay & Baayen (2003) investigated how morphotactic (or phonological) transparency influences productivity. They studied different consonant clusters and found out that those clusters that occur only across morpheme boundaries (e.g. the cluster /nh/ in *in-human*) are a very reliable sign for decomposition, which consequently leads to the higher productivity. On the contrary, consonant clusters that occur both within one morpheme and on the morpheme boundaries (cluster /mp/ in *lamp* vs. *im-possible*) are according to Hay less productive and are not facilitating decomposition (cf. Plag, 2004; Bauer, 2005).

Even though this model proposed by Hay (2000; 2001; &Baayen, 2003) provides powerful psycholinguistic foundation for the study of decomposition and productivity, it also has some weaknesses (Bauer, 2005; Dressler, 2007). For example, there can be found complex words whose bases are more frequent than their corresponding derivatives (lower relative frequency), they are opaque, coined by unproductive rules and the decomposition is unlikely to be present (e.g. *streng-th*). Moreover, this correlation between phonotactic transparency and productivity turns to be unable to explain diachronically changes of productivity of certain affixes. Bauer (2005) points out the fact that the productivity of one affix may change with time, although the phonotactic properties remain the same.

There is also a notion of regularity that can be defined as homogeneity of both input and output (Dressler, 2003; Bauer, 2001). It must be mentioned that regularity must not be understood as productivity itself, because there are both productive and unproductive WFRs that are regular. Some dual-route models (cf. Clahsen, 2003) argue that the default rule, which is very often the most productive one, is considered to be regular, whereas other competing rules are said to be irregular and therefore stored and retrieved as a whole word. However, as pointed out by Dressler (2003; 2007) this model turns out to be inappropriate for highly inflecting languages and their productive inflectional classes as well as for the word formation processes where there is usually more than one productive regular pattern. For

example, among Serbian suffixes for nomina agentis (section 6.4) none of them represent the default word formation rule.

2.5. Conclusion

To sum up, morphological productivity has been investigated by lots of scholars who try to give a precise definition and possible ways of measuring it. However, it is not a simple phenomenon, but rather the mixture of lots of linguistic and non linguistic factors. The problem here is that it is not easy to determine when and why certain factors win over others at a given point of time. All these make that there are so many different views and definitions, as it is explained in this chapter.

From the psycholinguistic point of view, it can be concluded that different processing factors (e.g. relative frequency, transparency, etc) contribute to the notion of productivity (Plag, 2004). However, these factors are not the only ones but there are rather a set of different structural factors and constraints, that interact constantly in influencing productivity. Due to all these factors, properties and restrictions, it seems that it is practically impossible to find a single 'way' for considering all of the present factors in order to establish the productivity degree of an affix or WFR under consideration. From that reason, it may happen that certain approaches aimed at measuring productivity show inconsistencies or are overruled by structural restrictions (Plag, 2004).

For grammatical productivity thus may be said to be determined by a mixture of the variety of processing factors and constraints that are essential on the level of the norms and of the probability of rule application on the level of performance, which all together plays a great role in choosing the 'route', i.e. decomposition vs. whole -word route of complex words.

3. Short sociolinguistic view on Serbian

As a typical representative of fusional-inflecting language type, the Serbian language has very rich morphology. It has a great potential for investigating inflected forms. It belongs to the South Slavic languages, together with Croatian, Bosnian, Slovene, Macedonian and Bulgarian. From a purely linguistic standpoint, Serbian, Croatian and Bosnian (recently Montenegrin also) are all varieties of the same language, namely Serbo-Croatian⁵. Therefore there is nowadays a common term used for these three languages, namely the abbreviation BCS that stand for Bosnian-Croatian-Serbian. This is also the accepted view of the Grammars of the Serbian language. Variations between these languages are fewer than between, for example, Canadian English and any other dialect of English (cf. McLennan, 1996), or between Austrian German and German spoken in Germany or in Switzerland. Officially, the 'Serbo-Croatian' language existed until the dissolution of the Yugoslavia in 1991 and was spoken by all Serbs, Croats, Bosnians and Montenegrins. Thus, it should be considered as one language with three main dialects: Štokavian (with its subdialects: old and new), Kajkavian and Čakavian. The names of these dialects are based on the word 'what', which is pronounced as 'što/šta', 'kaj' and 'ča' respectively. The new Štokavian dialects are taken as the standard. It has three variants: Ekavian (Serbia), Ijekavian (Serbia, Croatia, Bosnia and Montenegro) and Ikavian (Croatia). The differences between them are due to the existence of three different phonological realizations of the Old Church Slavonic vowel 'jat' [ě]: in Ekavian as [e], e.g. *mleko* 'milk', in Ijekavian as [ije]/[je] (e.g. *mlijeko* 'milk') and in Ikavian as [i] (e.g. *mliko* 'milk'), where only Ekavian and Ijekavian are standard. Apart from phonological and some lexical differences, morphological properties and syntactic constructions are the same and the languages are mutually comprehensible. However, since language and politics are so tightly connected in the Balkans, it is necessary to 'blame' the political history of the conflicts and wars, as well as factors such as national identity and religion for creating such a mixture of variants of one language on the territory of the former Yugoslavia. Thus, in order to answer the delicate question whether Serbian and Croatian are the same language or not, the preface of one very old book 'Serbian Grammar' (Subotić & Forbes, 1918) can serve as a very plausible explanation:

"The title of this book has been chosen for the sake of simplicity. The full name of the language is Serbo-Croatian. It must be emphasized that Croatian, except for slight differences of dialect and vocabulary, is absolutely the same language as Serbian, only written with the Latin alphabet with diacritic signs."

⁵ Consequently, data and results from available publications from these languages can be used interchangeably in order to study and explain different linguistic properties (adapting lexical differences, when necessary).

As mentioned in this definition, one of the differences lies in the choice of the alphabet, with Croatian using only the Latin alphabet and Serbian is a bi-alphabetic language, using both the Serbian Cyrillic and the Latin alphabet adapted to languages of former Yugoslavia. Serbian children start to use first the Cyrillic and after one year the Latin alphabet. Both alphabets are widely used in newspapers and books but the Latin alphabet seems to be dominant in every day usage.

4. Productivity in Inflection

“Productivity is a primitive property of inflectional morphology. It is prototypical for morphological categories, rules and paradigm classes formed by them.”

(Dressler, 2003; 32)

It is pretty clear that this definition refers to grammatical productivity, i.e. to the potential system of grammar, predicting the formation of grammatically correct inflectional words, which are opposed to actual ones. Since this formation happens by means of rules, the notion of the ‘productive rule’ should be also mentioned. In order to be considered productive, the rule must be applicable in the potential grammatical system and fitting to new forms which match the structural description of the rule (Dressler, 2003; 2005; 2012). The same is valid also for morphological classes and categories. As already mentioned, the productivity is a gradual process, which means that its degree varies i.e. some of the rules, classes and categories are more productive than others.

In order to understand the concept of productivity in inflectional morphology, a couple of important definitions should be first introduced.

An inflectional paradigm comprises all inflectional forms of one base (word, stem, or root) within the same inflectional system (conjugation or declension) (cf. Dressler, 2003). In contrast to these ‘regular’ paradigms, we also have cases of suppletive (lat. *supplēre*- add, replace) paradigms, which are formed with more than one root. These roots are in complementary distribution. Traditionally, these forms, which are not regular and systematic, are also called irregular. For example in Serbian, the auxiliary verb *biti* (infinitive) ‘to be’: *jesam* (1P.Sg.Pres. *sam* ‘I am’, 2P.Sg.Pres. *si* ‘you are’, 3P.Sg.Pres. *je* ‘He is’, etc.). In nominal inflection, the noun *čovjek* ‘man’ has the suppletive Pl. *ljudi* ‘men’. However, suppletive paradigms are not very helpful for studying of productive classes in one language. Generally speaking, productive inflectional paradigms are taken to be fundamental building blocks of the lexicon that are also very useful for the study of language and may be used as tools for description and teaching of foreign languages (cf. Milin et al., 2009).

Classes (used as a general term) are formed by sets of similar paradigms and contain subclasses which differ only in one morphological or in morphonological element. A typical example of an inflectional class may be the first declension of Latin nouns (e.g. *puella* ‘girl’) since it contains words whose inflectional paradigms are formed in the same way (e.g. Nom. Sg. *puell-a*, Gen.Sg. *puell-ae*, Dat.Sg. *puell-ae*, Acc.Sg. *puell-am*, Voc.Sg. *puell-a*, Abl.Sg. *puell-a*). More precisely speaking, one class can be hierarchically divided as follows: macroclass-class-subclass-microclass. A macroclass is obviously the most general type of class which comprises several microclasses. Prototypically, its nucleus is a productive class

(as well as sub- or microclass). Since productive patterns are generally interpreted as having a rule-like character, it is not accepted that one microclass consists only of rote-learned paradigms. Thus, a microclass is the smallest subset of an inflectional class above the paradigm. This set of paradigms shares exactly the same morphological properties (Dressler, 2003). Although they may differ via the application of purely phonological processes, different plural microclasses are not established in that way, e.g. Serb.Nom.Sg. *vrabac*, Pl. *vrapc-i*, 'sparrow' (with assimilation of voicedness due to the vowel-zero alternation) and Serb.Nom.Sg. *pisac*, Pl. *pisc-i* 'writer' (no assimilation) are members of the same microclass. On the other hand, with morphophonological alternations, separate microclasses are built, e.g. Nom. Sg. *bak-a*: Dat. Sg. *bak-i* 'granny' (no palatalization) vs. Nom.Sg. *majk-a*, Dat.Sg. *majc-i* 'mother' (morphophonological palatalization [k]: [ts]). Therefore, the feminine macroclass of Serbian nouns contains 2 classes with the total of 5 microclasses inside, since not all of them inflect in exactly the same way. More detailed explanation of verbal and nominal classes can be read in the following sections of this paper (sections 4.1.2.; 4.2.1.).

An isolated paradigm differs morphologically from all other paradigms. Such a paradigm doesn't form a microclass of its own, but it is rather considered to be a satellite to the most similar microclasses. All suppletive paradigms are considered to be isolated at the same time. For example, It. Sg. *il bue*: I buoi 'bull' (Dressler & Thornton, 1996).

The subclasses of the same macroclass must share at least (cf. Dressler et al. 1996):

- a) one exclusively identical unmarked-category realization . Unmarked means more basic in meaning, or more natural in meaning (e.g. singular is less marked than plural, etc).
- b) one exclusively identical paradigm structure condition (PSC). With this condition, from one or more inflectional forms other inflectional forms of the same paradigm/class can be predicted. For example, in Serbian, if there exists a thematic /a/, then the suffix *-ju* is added for 3P.PI.Pres., Inf. *gled-a-ti* 'to look', then 3P.PI. Pres. *gled-a-ju* 'they look'. Isolated paradigms may or may not share the PSC with other subclasses comprised in one macroclass.

Each class is characterized by some distinctive marker or marker combination of its own. Whereas recessive (stagnant) classes lose paradigms to dominant classes within the same macroclass and are marginal for morphological investigation of the productive patterns in one language, dominant classes are of the major importance for the investigation of the productive classes (cf. Dressler et al., 1996). There are also stable classes, which can be defined as neither recessive nor dominant.

As previously mentioned in this section, it is not accepted that one microclass consists only of rote-learned paradigms. However, productivity is not the same as regularity, because an unproductive rule can have a regular output. Dressler (1999) claims regularity to

be a hyperonym of productivity, where regularity means that the rule's input-patterns are homogeneous. Similarly, a productive pattern does not necessarily mean that it has a default status (strong or weak), because also among unproductive patterns there is one of them representing a default. For instance, among Serbian neuter nouns ending in *–o* or *–e*, the microclass Nom/Acc.Sg. *–o* corresponds to the default, although this whole microclass is unproductive (cf. section 4.1.3. of this Thesis).

4.1. An overview of Serbian nominal morphology

In the Serbian language the following parts of speech are inflected: nouns, adjectives, pronouns, numerals (cardinals until four; all ordinal and collective), verbs, and some adverbs (i.e. for comparison). They all change their forms according to their specific morphological categories. Compared to Romance or modern Germanic languages, Serbian has the more complex nominal inflection system, as most of other Slavic languages. Serbian nouns are marked for case and number. An overview of the morphological categories of nouns is given as follows.

➤ *Number*

This grammatical category in Serbian differentiates two numbers, singular and plural. However, in Gen.Pl. of some nouns the form of the old dual is preserved e.g. *oko* 'eye', *uvo* 'ear', *ruka* 'hand', with the Gen.Pl. respectively: *oči-ju*, *uši-ju*, *ruk-u*, instead of the Gen.Pl. ending in *–a*.

➤ *Gender*

Traditionally, Serbian grammar distinguishes both natural and grammatical (masculine, feminine, neuter) gender. Natural gender corresponds to the sex distinction which exists in nature, i.e. animates may belong to the masculine, feminine or neuter gender⁶. With the grammatical gender, there is no such motivation for the semantic distinction of nouns. Therefore, we have to take into consideration only the phonological form and/or morphological features of nouns referring to non-animate things, plants, ideas, etc. On the syntactic level, since Serbian belongs to the inflecting languages, there is an agreement (e.g. in case, number, gender) between nouns and other inflected parts of speech. Examples of nouns classified according to the grammatical gender are explained as follows:

⁶ Natural neuter gender comprises nouns referring to young people or animals, who are not yet assigned still masculine or feminine gender. Non-animate nouns terminating in *–o/–e* have only grammatical neuter gender.

a) Masculine: in most cases masculine nouns have Nom. Sg. ending in consonant: e.g. *sneg* 'snow', *grad* 'city', *Dunav* 'Danube'. However, there are cases of masculine nouns in –o or –e. e.g. proper names *Slavko*, *Pavle*, *striko* 'uncle', etc. A small class of masc. in –a, for professions (e.g. *sudija* 'judge', *vladika* 'high priest', *gazda* 'landlord', *zanatlija* 'artisan').

b) Feminine: in most cases feminine nouns have Nom.Sg. ending in –a: e.g. *ulica* 'street', *trava* 'grass', whereas some abstract nouns finish in a consonant, e.g. *ljubav* 'love', *mir* 'peace', etc.

c) Neuter: the majority of the nouns ending in –o/-e in Nom. Sg./ Acc. Sg. are neuter: e.g. *selo* 'village', *more* 'see', etc.

➤ Case

The Serbian declension system has seven cases: nominative, genitive, dative, accusative, vocative, instrumental, locative. The traditional classification is proposed by the Serbian grammarian Mihailo Stevanović (1964) and is based on different criteria, i.e. on the phonological form of the stem vs. endings, as well as on the morphological category of gender (both grammatical and natural).

4.1.1. Traditional classification of Serbian nouns

As already explained at the beginning of this section (4), an inflectional paradigm comprises inflected variants for one word formed by regular or predictable morphological transformations (Milin et al., 2009). Within the Serbian nominal system, a noun paradigm comprises inflected variants of one noun in two numbers and seven cases. For example, the Serbian noun *olovka* 'pencil' has the following inflected variants forming an inflectional paradigm: SG.: Nom. *olovka*, Gen. *olovke*, Dat. *olovci*, Acc. *olovku*, Voc. *olovko*, Instr. *olovkom*, Loc. *olovci* and PL.: Nom. *olovke*, Gen. *olovki*, Dat. *olovkama*, Acc. *olovke*, Voc. *olovke*, Instr. *olovkama*, Loc. *olovkama*. The set of all words that have their inflected paradigms formed in the same way is called inflectional class or declension class (for words that are marked for case). In Serbian, there are 4 traditional declension types of nouns (see table 1). This table shows four different declensions in Serbian, exemplified on the noun *prozor* 'window' for the first declension, *ime* 'name' for the second declension, *žena* 'woman' for the third declension and *ljubav* 'love' for the fourth declension with respective case endings added to the stems in order to form different inflected forms. Descriptions of nouns belonging to each of the four inflectional classes are given in the upper part of the table.

	Declension class I -masc. with Nom. Sg. ending in a cons. -masc. and neut. with Nom.Sg. in –o or –e and Gen.Sg. in -a -masc. monosyllabic with an infix -ov-/ev- in PL - fem. with Nom. Sg. ending in a cons. (usually diminutives) ⁷	Declension class II -neut. with Nom.Sg./ Acc.Sg. in –o/–e (with a stem amplification, either –n- or –t-. ⁸	Declension class III -fem. with Nom. Sg. in -a -masc. with Nom. Sg. ending in –a, (mostly professions) ⁹	Declension class IV -fem. with Nom. Sg. ending in a consonant
SINGULAR	Masc. ‘window’	Neut. ‘name’	Fem. ‘woman’	Fem. ‘love’
Nominative	prozor	ime	žena	ljubav
Genitive	prozor-a	ime-n-a	žen-e	ljubav-i
Dative	prozor-u	Ime-n-u	žen- i	ljubav-i
Accusative	prozor	ime	žen-u	ljubav
Vocative	prozor-e	ime	žen-o	ljubav-i
Instrumental	prozor-om	Ime-n-om	žen-om	ljubav-i (or-ju)
Locative	prozor-u	Ime-n-u	žen- i	ljubav-i
PLURAL	‘windows’	‘names’	‘women’	‘loves’
Nominative	prozor-i	ime-n-a	žen-e	ljubav-i
Genitive	prozor-a	ime-n-a	žen- a	ljubav-i
Dative	prozor-ima	ime-n- ima	žen-ama	ljubav-ima
Accusative	prozor-e	ime-n-a	žen-e	ljubav-i
Vocative	prozor-i	ime-n-a	žen-e	ljubav-i
Instrumental	prozor-ima	ime-n- ima	žen-ama	ljubav-ima
Locative	prozor-ima	ime-n- ima	žen-ama	ljubav-ima

Table 1: Four Noun Declension Classes in Serbian

This kind of classification takes phonological shape and the declension pattern as the main classifying criterion for establishing inflectional classes traditionally. As we can conclude from this table, there is a high degree of homophony (e.g. Declension class I: Gen.Sg. & Gen.Pl.) as well as syncretism within inflectional paradigms in the Serbian inflectional system of nouns. Some of the syncretisms in the Serbian declension are given as follows:

⁷ For example, fem. *devojka* ‘girl’ – *devoič-urak* ‘girl’ (diminutive), very unproductive microclass.

⁸ Such nouns usually have two Pl. paradigms: *dugme* ‘button’ (Sg. class II), whereas in Pl. declines either according to class I (masc.Pl.): *dugm-ić-i* (regular Pl.) or to class IV in singular: *dugm-ad* (mass nouns, irregular).

⁹ As already mentioned, masculine in -a (natural masculine, grammatical feminine gender, i.e. fem. declension), for professions, e.g. *sudija* ‘judge’, *vladika* ‘bishop’, kinship names (*tata* ‘daddy’, *deda* ‘grandpa’), etc.

- Dat.& Loc. in the singular and plural of all nouns have always the same form, but locative is always preceded by a preposition (*u* 'in', *na* 'on', *o* 'about', *po* 'upon', *pri* 'towards', *prema* 'towards').
- Dat., Instr. & Loc.: plurals of all nouns (*-amal-ima*)
- Nom. Voc. & Acc.: all neuters in the singular and plural

Other important feature of the Serbian declension to be mentioned is the fact that the genitive plural ending has a long vowel (in most cases *-a*, or *-u* in class IV), which always lengthens the previous syllable. In some dialects of central Serbia, only nominative and accusative are productive whereas other cases (especially instrumental) are becoming recessive. In other substandards, with verbs of motion there is no differentiation between locative or instrumental and accusative.

4.1.2. New classification of Serbian nouns

'The more genders a language has, the more macroclasses and productive microclasses it may have'

(Dressler&Thornton, 1996; 23)

Since the traditional classification is mainly based on the phonological shape of words, it is not suitable enough to show all variations among declension paradigms within the same inflectional class. The framework of Natural Morphology, more precisely its third subtheory of language-specific naturalness, proposes more detailed division of one class (macroclass-class-subclass-microclass; cf. chapter 4), which may be very useful also for one more precise and correct establishment of declension classes in Serbian. Therefore, as shown by Dressler & Thornton (1996) for Italian, also for Serbian the main criterion for class division should be gender and the respective inflectional paradigm. This means that the new grouping (see below) of Serbian nouns has three gender-determined macroclasses (marked with I, II and III) with their respective subdivision into classes (marked with 1,2,3, etc.), subclasses (marked with a, b, c, etc.) and microclasses (marked with a_1 , a_2 , a_3 , etc.). The new classification in more detail with relevant examples is given as follows. For example, the declension class I.1a) comprises masculine nouns that have their Nom. Sg. form ending in a consonant (X- $\emptyset$) and the Nom. Pl. in *-i* (X-i). Then, the further division into its microclasses (here: I.1a₁ and I.1a₂) shows differences within that inflectional paradigm, marking morphonological alternations, or other relevant differences. Moreover, sometimes there are also isolated paradigms that are morphonologically different from all other patterns. Although they do show certain common characteristics with other members of the class they belong to, they show some inconsistencies or irregularities and therefore they are labeled as 'satellite

isolated' paradigms. In this classification, only the general distinction between productive and unproductive microclasses is given. More detailed description and classification of Serbian inflection patterns in terms of productivity according to well established criteria in the framework of Natural Morphology will be described in the following section (4.1.3).

I MASC.

SG.

PL.

1a) X-∅

X-i

1a₁) X-∅

X-i [+palat.] productive

[+animate] Ex. *dečak* 'boy'

(Nom.Sg. *dečak*, Gen.Sg. = Acc. Sg. *dečak-a*, Nom.Pl. *dečac-i*)

[-animate¹⁰] Ex. *vidik* 'view'

(Nom.Sg. =Acc. Sg. *vidik*, Gen.Sg. *vidik-a*, Nom.Pl. *vidic-i*)

Isolated satellite paradigm: Nom. Sg. *čovek*, Gen.Sg. = Acc. Sg. *čovek -a*, Nom. Pl. *ljudi*¹¹ 'man'

1a₂) X-∅

X-i [-palat. environment]¹² productive

[+animate] Ex. *lopov* 'thief'

(Nom.Sg. *lopov*, Gen.Sg. = Acc. Sg. *lopov-a*, Nom.Pl. *lopov-i*)

[-animate] Ex. *prozor* 'window'

(Nom.Sg. =Acc. Sg. *prozor*, Gen.Sg. *prozor-a*, Nom.Pl. *prozor-i*)

1b) X-∅

X- (-ov/-ev)¹³-i productive

[+animate] Ex. *šef* 'boss'

(Nom.Sg. *šef*, Gen.Sg. = Acc. Sg. *šef-a*, Nom.Pl. *šef-ov-i*)

[-animate] Ex. *grad* 'town'

(Nom.Sg. =Acc. Sg. *grad*, Gen.Sg. *grad-a*, Nom.Pl. *grad-ov-i*)

¹⁰ The problem of animacy i.e. the semantic difference between animate and inanimate objects is significant for inflection of nouns in the Serbian language. As we can see within the masculine macroclass, animate nouns have Gen.Sg.=Acc.Sg., whereas inanimate nouns have Nom.Sg= Acc.Sg. However, since animacy is just a matter of semantics and it can be inferred only lexically, I propose that animacy should not be considered as a criterion for establishment of two different microclasses. Moreover, the difference regarding animacy is not present in plural.

¹¹ Declension pattern in Pl. the same as with class II.2)

¹² The palatalization environment within this microclass refers to words ending in velars that are changed according to the scheme [k]: [ts], [g]:[z], [h]:[s] in front of an [e] or [i].

¹³ The infix -ov- is used after non-palatal whereas -ev- after the palatal ones.

[+ animate] Ex. *miš* 'mouse'

(Nom.Sg. *miš*, Gen.Sg. = Acc. Sg. *miš-a*, Nom.Pl. *miš-ev-i*)

[- animate] Ex. *nos* 'nose'

(Nom.Sg. =Acc. Sg. *nos*, Gen.Sg. *nos-a*, Nom.Pl. *nos-ev-i*)

Isolated paradigm: Nom. Sg. *brat*, Gen.Sg.=Acc.Sg. *brat-a*, Nom. Pl. *braća*¹⁴ 'brother'

1c) X-∅ x'¹⁵ –i productive

Ex. Nom. Sg. *čoban-in*, Gen.Sg.=Acc.Sg. *čoban-in-a*, Nom. Pl. *čoban-i*, not: **čoban-in-i* 'shepherd' Many ethnics in –in (e.g. Sg. *Srb-in* 'Serb', Pl. *Srb-i*; Sg. *Bugar-in* 'Bulgarian', Pl. *Bugar-i*) belong to this microclass.

2) X-vowel¹⁶ X-i

2a) X-vowel X-i (full base) productive only for LWs

[+ animate] Ex. Nom. Sg. *soko*¹⁷, Gen.Sg. =Acc. Sg. *sokol-a*,
Nom. Pl. *sokol-i* 'eagle'

[- animate] Ex. Nom. Sg. =Acc. Sg. *nivo* 'level' , Gen.Sg. *nivo-a*,
Nom. Pl. *nivo-i*

[- animate] Ex. Nom. Sg. =Acc. Sg. *kupe* (<Fr. *coupé*), Gen. Sg.
kupe-a

[- animate] Ex. Nom. Sg. =Acc. Sg. *intervju* (<Eng. *interview*), Gen.
Sg. *intervju-a*, Nom. Pl. *intervju-i*

2b) X-vowel X-i (shortened base) productive only for LWs

[+ animate] Ex. Nom. Sg. *zelenko*, Gen. Sg.=Acc. Sg. *zelenk-a*
'green horse'

[- animate] Ex. Nom. Sg. =Acc. Sg. *radio*, Gen.Sg. *radij-a*
(not: **radio-a*), Nom. Pl. *radij-i*

¹⁴ Plural declension pattern the same as II.1) in Singular!

¹⁵ x' stays for the stem (or sometimes to the root) of the noun, i.e. Nom. Sg. without the ending –in: *Srb-in* e.g. Nom.Sg. *Srb-in*, Nom. Pl. *Srb-i*, and not **Srb-in-i*

¹⁶ All members of the class I.2 end in vowel other than –a.

¹⁷ Some indigenous Serbian words had word-final –l, which was later changed into –o (long)(/l-to-o change) in Nom. Sg. (*sokol*>*sokoo*>*soko*). However, this –l is still visible in declension pattern, which means that the base equals to the whole word, i.e. this may be an example of word-based morphology as well.

[-animate] Ex. Nom. Sg.=Acc.Sg. *viski*¹⁸ (<Eng. *whiskey*),
 Gen.Sg. *viskij-a*, Nom. Pl. *viskij-i*
 [+animate] Ex. Nom. Sg. *Pavle*, Gen.Sg.=Acc.Sg. *Pavl-a*

2c) X-vowel X-a (shortened base) little productive, only for LWS

[-animate] Ex. Nom. Sg.=Acc.Sg. *tempo*,
 Gen.Sg. *temp-a*, Nom. Pl. *temp-a*
 [-animate] Ex. Nom. Sg.=Acc.Sg. *kino*,
 Gen.Sg. *kina-a*, Nom. Pl. *kina-a*

II FEM.

1) X-a X-e

1a₁) X-a X-e productive

[+palat. in Dat./Loc.] Ex. *majka* 'mother'
 (Nom. Sg. *majka*, Dat. Sg. *majk-i*, Acc.Sg. *majk-u*, Nom.Pl. *majk-e*)
 Ex. MASC. *vladika* 'bishop'
 (Nom. Sg. *vladika*, Dat. Sg. *vladic-i*, Acc.Sg. *vladik-u*¹⁹, Nom.Pl. *vladik-e*)

1a₂) X-a X-e productive

[-palat. in Dat./Loc.] Ex. *baka* 'granny'
 (Nom. Sg. *bak-a*, Dat. Sg. *bak-i*, Acc.Sg. *bak-u*, Nom.Pl. *bak-e*)
 Ex. *koka* 'Coke' (new LWS), but also indigenous hypocoristic of
kokoška 'hen'.
 (Nom. Sg. *kok-a*, Dat. Sg. *kok-i*, Acc.Sg. *kok-u*, Nom.Pl. *kok-e*)

1a₃) X-a X-e (elsewhere, i.e. no palat. condition) productive

Ex. *žena* 'granny'
 (Nom. Sg. *žen-a*, Dat. Sg. *žen-i*, Acc.Sg. *žen-u*, Nom.Pl. *žen-e*)

¹⁸ There are only few loan words ending in *-i*, such as *bambi* (used in Serbian for all small deer or fawn), *bikini*, *derbi*, *taksi*. No indigenous word in *-i* has been found. There are also some nicknames that end in *-i* (e.g. *Ceci*, *Dimi*, *Tiki*, etc.) which belong to this microclass if they refer to masculines. But if they are used as feminine nicknames, they tend to remain undeclined (e.g. *Kaži to Dimij-u!* 'Say it to Dimi-Dat.Sg. (proper male name)!' vs. *Kaži to Tiki!* 'Say it to Tiki-Dat.Sg. (proper female name)!')

¹⁹ The fact that these masculine nouns in *-a* (usually for professions) don't have Nom Sg.=Gen. Sg. shows that inflectional microclass is more important than the [+animate] feature.

Ex. MASC. *sudija* 'judge'²⁰

(Nom. Sg. *sudija*, Dat. Sg. *sudij-i*, Acc.Sg. *sudij-u*, Nom.Pl. *sudij-e*)

1a₄) X-a X-e unproductive

Ex. *ruka* 'hand', *noga* 'leg' (2 members only, Gen. Pl. in -u)

(Nom. Sg. *ruka*, Dat. Sg. *ruc-i*, Acc.Sg. *ruk-u*, Nom.Pl. *ruk-e*, Gen. Pl. *ruk-u*)

Isolated satellite paradigm: Nom. Sg. *mati*, Acc.Sg. *mater*, Gen. Sg.=Nom. Pl. *mater-e* 'mother'

2) X-∅ X-i²¹ unproductive

Ex. *ljubav* 'love' (Nom.Sg. =Acc.Sg. *ljubav*, Gen.Sg.=Nom.Pl. *ljubav-i*)

Isolated satellite paradigm: Nom.Sg. *kći*, Acc.Sg. *kćer*, Gen. Sg.=Nom. Pl. *kćer-i* 'daughter'

III NEUT.

1) X-o X-a

1a₁) X-o X-a (no stem amplification) unproductive

Ex. Nom. Sg.=Acc.Sg.=Voc.Sg. *selo*,

Gen.Sg.=Nom.Pl.= Acc. Pl. Voc. Pl. *sel-a*, 'village'

Isolated satellite paradigm: Nom. Sg. *oko*²² 'eye' Nom. Pl. *oč-i*, Gen. Pl. *oč-i-ju*

1a₂) X-o X-s-a (with stem amplification) unproductive

Ex. Nom.Sg.=Acc.Sg.=Voc.Sg. *čudo*,

Gen.Sg.=Nom.Pl. *čud- a/ čude-s-a* 'wonder'

(3 members only: *telo* 'body', *nebo* 'sky', *čudo* 'wonder')

²⁰ Other MASC. nouns from this microclass are: e.g. *vojvoda* 'duke' (professions), *tata* 'daddy', *deda* 'grandpa' (kinship names), *gazda* 'landlord', *papa* 'pope', *mušterija* 'customer', *zanatlija* 'artisan', Nikola, Nemanja (proper names), etc. This noun type is typologically unusual (cf. Corbett, 2009) and such nouns have the same inflectional paradigms as feminine nouns (traditional class III), i.e. grammatical feminine gender, but denote masculine (sometimes feminine nouns also, e.g. *mušterija* 'customer' is used for both fem. and masc.).

²¹ Noun *so* 'salt' belongs to this microclass, as well, because it originally had word-final -l (< sol) which changed into o word finally (sol> soo>so, long o), cf. note 17.

²² The noun *oko* 'eye' in plural is feminine and has the declension pattern as feminine class II.2

2) X-e X-a

2a₁) X-e X-a (no stem amplification) unproductive
Ex. Nom.Sg.=Acc.Sg.=Voc.Sg. *polje*,
Gen.Sg.=Nom.Pl. *polj-a* 'field'

2a₂) X-e X-n-a (with stem amplification) unproductive
Ex. Nom.Sg.=Acc.Sg.=Voc.Sg. *ime*,
Gen.Sg.=Nom.Pl. *ime-n-a* 'name'

2a₃) X-e X-t-a (with stem amplification) little productive
Ex. Nom.Sg.=Acc.Sg. *kube*,
Gen.Sg.=Nom.Pl. *kube-t-a* 'furnace'
Ex. Nom.Sg.=Acc.Sg. *momče* 'boy-DIM'

(NEUT DIM formed with -če and -ence belong to this neuter microclass)

Isolated satellite paradigm: Nom.Sg.=Acc.Sg. *veče*, Gen.Sg. =Nom. Pl. *veče-r-a* 'evening'

4.1.3. Grammatical productivity of Serbian nominal classes

Using the classification from the previous section (4.1.2.), I examine here the most productive patterns in Serbian noun inflection with regard to the third subtheory of the NM framework, namely language-specific system adequacy (see section 1.3 of this Thesis), which must be constructed on the basis of productive microclasses.

As already mentioned, productivity is a gradual process, as well as other concepts in the theory of Natural Morphology. This graduality of productivity was studied by many scholars (cf. Bauer, 2001; Plag, 1999; Baayen, 1989). Dressler (2003) focuses on graduality of grammatical productivity within the potential system. Thus, the concept of gradualness proposed by NM theorists corresponds to the following hierarchy of criteria of inflectional productivity (A-E), starting from the most important to the least important one and is illustrated as follows:

A) The concept of secondary productivity first proposed by Wurzel (1984) concerns the integration of loan words with unfitting properties which have to be fitted to the system adequacy of the loaning language (Dressler, 2003). It is considered to be the most important criterion because in such cases productivity works under the most difficult circumstances, i.e.

during this process there are two difficulties (foreignness and unfitting properties) which have to be defeated by a maximum productivity of one rule. Loan words from genderless languages are one of the commonest unfitting properties. It is very frequent in Serbian, since genderless English loan words are very numerous. Dressler (2003) suggests that the fitting (i.e. maintaining or only minimally adapting phonological shapes) of gender is very important. Generally speaking, for languages which possess this morphological category, this process gives very useful evidence for the establishing of productive classes. Consider the following examples from Serbian:

If one foreign word ends in *-a*, it will be put into the phonologically corresponding feminine class II.1, the only productive one for feminine. Further subdivision into three microclasses depends on the existence of the morphological palatalisation.

(1) Finn. (genderless) > fem. Sg. *sauna*, Pl. *saun -e* (class II. 1a₃)

(2) Jap. (genderless)²³ > Fem. Sg. *gejša*, Pl. *gejš-e* (class II. 1a₃)

(3) Eng. (genderless) > Fem. Sg. *koka*, Pl. *koke-e* 'Coke' (class II. 1a₂)

Similarly, when one loan noun coming from a genderless language denotes a profession (example 3), i.e. if the noun in question has a masculine natural gender it will be assigned to the class II.1, like indigenous nouns, e.g. *sudija* 'judge' or *vladika* 'bishop'.

(4) Tibetan monk > masc. *lama*, Pl. *lam-e* (class II. 1a₃)

If a word ends in a consonant or in *-o*, it will be put into the corresponding productive masculine class I.1 or into less productive I.2, respectively.

(5) Jap. (genderless) *kimono* > masc. Sg. *kimono* Pl. *kimon- a* (class I.2c)

(6) Eng. (genderless) *dribbling* > masc. Sg. *dribbling*, Pl. *driblinz-i* (class I.1a₁) (with the palatalization [g]:[z], which is very common for Serbian masc. nouns ending in a consonant).

(7) Eng. (genderless) *radar* > masc. Sg. *radar*, Pl. *radar-i*; Eng. *laser* > masc. Sg. *laser*, Pl. *laser-i*; (I.1a₂)

(8) Eng. (genderless) *flirt* > masc. Sg. *flert*, Pl. *flert-ov-i* (with the infix *-ov-*) (class I.1b). The same pattern also for the following genderless LWs from English:

bluff > masc. Sg. *blef*, Pl. *blef-ov-i*

box > masc. Sg. *boks*, Pl. *boks-ov-i*

film > masc. Sg. *film*, Pl. *film-ov-i*

jeep > masc. Sg. *džip*, Pl. *džip-ov-i*

It may be concluded that most of monosyllabic loan words belong to the I.1b microclass.

(9) Eng. (genderless) *radio* > masc. Sg. *radio*, Pl. *radij-i* (class I.2b)

²³ This noun does not have grammatical gender, but it has the natural one (female).

In some older loan-words, both gender and phonological shape are adapted in Serbian words loaned via English, such as:

(10) Eng. (genderless) *jungle* > fem. Sg. *džungla*, Pl. *džungl-e* (class II.1a₃) (fem. like synonymous indigenous word for forest 'šuma')

(11) Abbreviations of the foreign origin finishing in a consonant or in -o are also integrated as declinable masculine nouns of the class I.1 e.g. UNICEF, NATO, GESTAPO, etc. Gen. Sg. *od NATO-a* (class I.2a) 'from NATO', *sa UNICEF-om* 'with UNICEF' (class I.1b).

As explained by Wurzel (1984), when there is the integration of LWs with word-final phonological adaptation, such words are considered to have unfitting properties as well. Some examples are illustrated as follows:

(12) Fr. masc. *l'étage* > Serb. fem. Sg. *etaža*, Pl. *etaž-e* 'floor, level'; Fr. masc. *le garage* > Serb. fem. Sg. *garaža*, Pl. *garaž-e* (class II.1a₃). It is not clear in which period these loan words of French origin came into Serbian. It is thus also possible that they came from German, where these words are already feminine. Nevertheless, we have word-final adaptation as a non-fitting property in both cases.

(13) Fr. fem. *purée* > Serb. masc. Sg. *pire*, Pl. *pire-i* 'mashed potatoes' (class I.2a)

(14) Ger. fem. *die Schminke* > Serb. fem. Sg. *šminka*, Pl. *šmink-e* 'make-up' (class II.1a₂); Ger. *die Karte* > Serb. fem. Sg. *karta*, Pl. *kart-e* (class II.1a₃); Ger. *die Schnalle* > Serb. fem. *šnala*, Pl. *šnal-e* 'buckle' (class II.1a₃)

(15) Ger. *die Sülze* > Serb. masc. Sg. *sulc*, Pl. *sulc-ev-i* 'aspic' (class I.1b);

(16) It. masc. *il balcone* > Serb. masc. Sg. *balkon*, Pl. *balkon-i* 'balcony'; It. masc. *il tenore* > Serb. masc. Sg. *tenor*, Pl. *tenor-i*; It. masc. *il cappotto* > Serb. masc. Sg. *kaput*, Pl. *kaput-i* 'coat'; It. masc. *il milione* > Serb. masc. Sg. *mlion*, Pl. *mlion-i* (class I.1a₂)

From previous examples, it may be concluded that feminine German loan words in -e show word-final adaptation (e→a), because there are no indigenous Serbian feminine words in Serbian in -e. On the other hand, loan words from Italian usually finish in vowels and this fact represents inadequate property for Serbian inflectional system. Therefore, such loan words are integrated with word-final adaptation (It. vowel-ending word→ Ser. consonant-ending word, e.g. It. *il balcone*, *il cappotto* → Ser. *balkon*, *kaput*), because masculine nouns in a consonant are more common and typical than masculine nouns in a vowel for the Serbian language. Similarly, some rare examples (example 15) vouch for higher productivity of masculine microclass in a consonant, than feminine microclass in -a, because this example shows not only the word final adaptation, but also another unfitting property, namely the feminine gender of the input loan word in its original language (here German).

There are cases of the loaning of words that seem to have fitting properties for the target language, such as for example loan words from languages that have gender and that

finish in a vowel or consonant. If there is more than one option, the more productive one will win. To illustrate this point let us take the case of German neuter noun *auto* 'car' (the same is true for the noun *kino* 'cinema') into Slavic languages. Neuter in -o is considered to be the default ending of neuters (Nom.Sg. = Acc.Sg.). In Polish for example, this noun *auto* is loaned in its original form and gender, which means that this neuter inflectional pattern in -o (and Nom. Pl. in -a) is dominant and productive. But in Serbian, this German system-defining property is unfitting for the Serbian inflectional system, and this noun is integrated as masculine noun of the class I.2a₂ (Nom. Sg. *auto*, Nom. Pl. *aut-i*). This means that neuter Serbian inflectional microclass in -o (III.1a₁) is unproductive whereas the masculine class in -o (I.2) is dominant, more suitable, more natural, less marked and therefore more productive for the language specific inflection of the Serbian language.

(17) Ger. *das Auto* > Serb. masc. Sg. *auto*, Pl. *aut-i* (class I.2b)

(18) Ger. *das Kino* > Serb. masc. Sg. *kino*, Pl. *kin-a* (class I.2c)²⁴

This case of loaning means that the neuter microclass in -o is unproductive in Serbian (the same is true for Slovene and Croatian), but highly productive in Polish.

Similarly, words that finish in a consonant in Serbian may be either masculine (class I.1) or feminine (II.2). If a LW finishes in a consonant it is assigned to a productive masculine gender class, irrespective of the original gender, e.g.

(19) Ger. *die Zeitnot* > Serb. masc. Sg. *cajtnot*, Pl. *cajtnot-i* 'shortage of time' (class I.1a₂)

(20) Ger. *das Wunderkind* > Serb. masc. Sg. *vunderkind*, Pl. *vunderkind-i*²⁵ 'child prodigy' (class I.1a₂)

This means that system defining properties of feminine or neuter loan words finishing in a consonant are unfitting, and therefore these words are transferred into corresponding masculine classes in the process of their integration.

To sum up, the integration of genderless nouns or other loan words with system-defining unfitting properties (e.g. neuter nouns in -o) is the most important criterion for full productivity, i.e. it is the most reliable criterion that shows which the most productive inflectional patterns in Serbian are, namely masculine microclass ending in a consonant (class I.1), feminine microclass ending in -a (class II.1), followed by masculine microclass in -o (class I.2).

B) The second criterion is Wurzel's primary productivity (1984), which occurs in the integration of loan words with already fitting properties, the class-defining properties of

²⁴ The noun *kino* is without a doubt integrated into Serbian as masculine (in Singular, whereas in Plural it is neuter). However, for some native speakers from Croatia, this noun belongs to a neuter declension class (in Singular), which is in line with the note 7 of the article by Dressler et al. (1996).

²⁵ According to the Morphological Dictionary of the Serbian language (*Morfološki rečnik srpskog jezika*, available online (<http://www.lexicom.rs>) the Plural form of this LW is *vunderkind-i* (microclass I.1a₂). However, for some native speakers, it should be declined adding an interfix in plural and therefore belonging to a different microclass: *vunderkind-ov-i* (microclass I.1b).

gender and appropriate word-final shape form. The only difficulty that has to be overcome is foreignness (cf. Dressler, 2003). Most examples of loan words with already fitting properties come into Serbian language usually from Italian or Spanish, as explained in the following examples.

(21) It. masc. *il tempo* > Serb. masc. Sg. *tempo*, Pl. *tempa* (class I.2c); It. masc. *il paparazzo* > Serb. masc. Sg. *paparaco*, Pl. *paparac-i* (class I.2b)

If we observe all the examples of loan words in *-o* whether they come from genderless languages or not, they are fitted as masculine nouns in *-o* (class I.2), which confirms the assumption that the inflectional classes are unproductive in Serbian. Another interesting evidence comes from the fact that, although this microclass (masc. in *-o*, I.2) is less productive among indigenous nouns, it integrates all LWs in *-o*, which, again, makes the masculine gender dominant over the neuter.

The following loan nouns with pertinent word-final phonological shape (Wurzel, 1984) show high productivity of the feminine noun class in *-a* (class II.1):

(22) Sp. fem. *la corrida* > Serb. fem. Sg. *korida*, Pl. *korid-e* 'run'; Sp. fem. *la lama* > Serb. fem. Sg. *lama*, Pl. *lam-e* (animal)

(23) It. fem. *la pizza* > Serb. fem. *pica*, Pl. *pic-e*; It. fem. *La mafia* > Serb. fem. *mafija*, Pl. *mafij-e*; It. fem. *l'opera* > Serb. fem. Sg. *opera*, Pl. *oper-e*; It. fem. *la medaglia* > Serb. fem. Sg. *medalja*, Pl. *medalj-e* 'medal'; It. fem. *l'aria* > Serb. fem. Sg. *arija*, Pl. *arij-e*; It. fem. *la bomba* > Serb. fem. Sg. *bomba*, Pl. *bomb-e* 'bomb', etc.

Similarly, masculine loan words finishing in a consonant are considered to have fitting properties and are therefore integrated into the Serbian language in its original form (sometimes with minor word-internal phonological adaptation) and gender into corresponding masculine class (I.1), as shown below:

(24) Ger. masc. *der Meister* > Serb. masc. Sg. *majstor*, Pl. *majstori* 'master, boss'; Ger. masc. *der Schneider* > Serb. masc. Sg. *šnajder*, Pl. *šnajder-i* 'tailor'; Ger. masc. *der Maler* > Serb. masc. Sg. *moler*, Pl. *moler-i* 'painter'.

Masculine French words finishing in *-o* or *-e* (preserving the original pronunciation) are considered to have fitting properties and are integrated into masculine classes I.2a, I.2b or I.2c.

(25) Fr. masc. *niveau* [ni'vo:] > Serb. masc. Sg. *nivo*, Pl. *nivo-i* (class I.2a)

(26) Fr. masc. *coupé* [ku'pe:] > Serb. masc. Sg. *kupe*, Pl. *kupe-i* (class I.2a)

C) The third criterion is described as the inflection of indigenous neologisms, abbreviations and conversions. According to the universal naturalness parameters (section 1.1), conversion is more marked and less natural than other morphological techniques (e.g. suffixation or modification) in most parameters, except for morphotactic transparency (cf.

Manova, 2005). It is generally less integrated than affixation. This great unnaturalness on most parameters results in generally lower degree of productivity of conversion.

A prototypical conversion is defined by Manova (2005) as ‘word class change of a base to/from which addition/substitution and deletion of inflectional affixes are allowed’. Two main types of this morphological technique may be distinguished, namely morphological and syntactic conversion. As explained by Manova (2005), morphological conversions include prototypical derivation (i.e. word-class-changing conversion), non-prototypical derivation (i.e. word-class-preserving conversion) and non-prototypical inflection (i.e. formal conversion). With morphological conversion, the input and the output of this morphological technique are semantically related and belong to different inflectional paradigms.

On the other hand, there are also cases of syntactic conversion, which involves the use of a word in the syntactic position of another word-class (Manova, 2005). The input and the output of this kind of conversion belong to the same paradigm. In Slavic languages substantivization (conversion of adjectives, participles, infinitives or minor word-classes into nouns) and adjectivization (conversion of participles into adjectives) are the most common examples of syntactic conversion.

Thus, the main distinction between the two types concerns the change in paradigm, i.e. there are morphological changes which result in different paradigms in cases of morphological conversion.

The nouns ending in *-o*, which are formed using the neuter form of corresponding adjectives, keep the neuter gender but the declension pattern is different, as shown in the following examples (morphological conversion):

(27) adj. neut. *dobr-o* (Gen.Sg. *dobr-og*, Dat. Sg. *dobr-om*) ‘good’ > n. neut. *dobro* (Gen.Sg. *dobr-a*, Dat. Sg. *dobr-u*) ‘estate’ (class III.1a₁)

(28) adj. neut. *zlo* (Gen.Sg. *zl-og*, Dat. Sg. *zl-om*) ‘evil’ > n. neut. *zlo* (Gen.Sg. *zl-a*, Dat. Sg. *zl-u*) ‘woe’ (class III.1a₁)

(29) adj. neut. *blag-o* (Gen.Sg. *blag-og*, Dat. Sg. *blag-om*) ‘gentle, kind’ > n. neut. *blago* (Gen.Sg. *blag-a*, Dat. Sg. *blag-u*) ‘wealth’ (class III.1a₁)

(30) adj. neut. Sg. *slatk-o*, Pl. *slatk-i* ‘sweet’ (Gen.Sg. *slatk-og*, Dat. Sg. *slatk-om*) > n. neut. *slatk-o*, Pl. *slatk-a* ‘marmalade, dessert’, (Gen.Sg. *slatk-a*, Dat. Sg. *slatk-u*) (class III.1a₁)

(31) adj. fem. *mlad-a* (Dat. Sg.=Loc.Sg. *mlad-oj*) ‘young’ > n. fem. *mlada* (Dat. Sg.=Loc. Sg. *mlad-i*) ‘bride’ (class II.1a₃)

(32) adj. masc. *nečist* ‘dirty’ > n. fem. *nečist* ‘dirt’. This is one of very few examples of word-based conversions, which is language-specific to Serbo-Croatian (cf. Manova, 2005). Interestingly, gender has been changed, namely the converted noun follows the feminine declension pattern of the unproductive class II.2 although it has been formed from the masculine gendered adjective.

To sum up, most Serbian nouns formed via adjective-to-noun morphological conversion land into the neuter microclass (III.1a₁). However, as already seen before, neuter gender in general is little productive, and there is no foreign word that follows such a pattern when integrated into Serbian language. Therefore, these examples do not vouch for high productivity of neuter inflectional class in Serbian language.

Examples of syntactic conversion are less common and most of substantivization examples in Serbian involve adjective declension. In order to understand how this kind of conversion works, few words need to be said about Serbian adjectives. There are two kinds of adjectives: definite (long) and indefinite (short) adjectives. The inflection of short adjectives usually coincides with the nominal inflection, which means that both input and output follow the same paradigm by nature, from the beginning. Moreover, the declension of short and long feminine nouns differs only in accentuation. Manova (2005) points out that the difference between these inflection patterns is small and that Serbo-Croatian grammars prefer long forms of adjectives for describing adjective-to-noun substantivization, labeling them as cases of syntactic conversion, since follow the same inflectional path, which can be seen in following examples.

(33) adj. fem. *engleska* (long form only, Dat. = Loc. Sg. *englesk-oj*) 'English' > country name: N. fem. *Engleska* 'England' (Dat. = Loc. Sg. *Englesk-oj*). It means that the output noun follows the same adjectival inflection pattern as the long form adjective.

(34) adj. fem. *hrvatska* (long form only, Dat. = Loc. Sg. *hrvatsk-oj*) 'Croatian' > country name: N. fem. *Hrvatska* 'Croatia' (Dat. = Loc. Sg. *Hrvatsk-oj*) (adjectival inflection pattern)

(35) adj. masc. *dobr-i* (long form of adj. Gen. Sg. *dobr-og*, Dat. Sg. *dobr-om*) vs. *dobar* (short form of the adjective, Gen. Sg. *dobr-a*, Dat. Sg. *dobr-u*), 'good' > male proper nouns: *Dobri* – Gen. Sg. *Dobrog* (*a*) (the short form of the adjective is *dobar* 'good', Gen. Sg. *dobr-a*) (adjectival inflection pattern, long adjectives). In some dialects there is the variant of the same proper name *Dobra*, formed via conversion from the same adjective. However, since the inflection differs from the input adjective (Nom. Sg. *Dobra*, Gen. Sg. *Dobr-e*, Dat. Sg. = Loc. Sg. *Dobr-i*, feminine productive class II.1a₃, this example shows thus the morphological conversion.

In spite of being less integrated than other indigenous neologisms, abbreviations of all kinds can also be useful for the study of productive classes in one language.

(36) masc. *autobus*, abbreviated masc. *bus*, Pl. *bus-ev-i* (class I.1b)

(37) masc. *fakultet/faksimil* abbr. masc. *faks*, Pl. *faks-ov-i* (class I.1b)

(38) masc. *profesor*, abbr. masc. *profa*, Pl. *prof-e* (class II.1a₃)

(39) fem. *diskoteka*, abbr. masc. *disko* (class I.2a₂), also accommodated form *diskać*, Pl. *diskać-i* (class I.1a₂)

These examples confirm that the preferred pattern for monosyllabic consonant ending words is the productive masculine class with an infix –ov- or –ev- (class I.1b). Example 25 (*profa*) confirms that masculine professions in -a belong to the highly productive feminine microclasses (II.1a), whereas monosyllabic words (here abbreviations) usually belong to the masculine class I.1b (with –ov- and –ev-).

The same model is valid for the abbreviations of complex proper names, such as masc. *SKOJ* (class I.1b: Nom. Sg. *SKOJ*, Gen. Sg. *Skoj-a*, Dat. Sg. *Skoj-u*, etc.), *SKC*, *NOLIT*, etc., where they follow the declension either of the class I.1 if they end in a consonant or class II.1, if ending in –a (class II.1a: Nom. Sg. *FIFA*, Gen. Sg. *FIF-e*, Dat. Sg. *FIF-i*, etc.). As already seen, abbreviations ending in –o follow the corresponding masculine inflection classes (e.g. class I.2b: Nom. Sg. *UNESCO*, Gen. Sg. *UNESC-a*, Dat. Sg. *UNESC-u* etc.).

Thus, even the third criterion confirms that in Serbian the only fully productive inflectional classes are masculine I.1 and feminine II.1, followed by masculine in –o class I.2.

D) The fourth criterion for productivity is class shift of a paradigm, which can be illustrated by the following example from one substandard dialect of south-central Serbia. The following examples in Serbian are in line with the examples illustrated with previous criteria.

(40) Instead of neuter *mesto* 'place' (class III.1a₁), this noun declines as if it was feminine (class II.1a₃), when used in speaking, e.g. '*na dva mesta*' 'on the two places', it is said **na dve meste*.

The shift goes normally in the direction from a recessive and less productive to a more productive or more stable class. It means that the neut. microclass ending in –o (class III.1) is less productive or totally unproductive compared to the feminine microclass ending in –a (class II.1).

There are other examples of class shift, which occur in the standard as well. The most common error of that type is illustrated by the shift from the unproductive microclass of *plurale tantum* neuter nouns of Latin origin to the very productive class II.1 feminine paradigm, e.g.:

(41) Instead of saying Acc. Pl. neut. *script-a* 'notes', it is very common to hear Acc. Sg. fem. *script-u*.

(42) There are also examples of the shift from the unproductive feminine microclass II.2 of the noun *so* 'salt', to the masculine microclass I.2a in the nominative/accusative singular. Therefore, instead of grammatically correct *Daj mi tu so!* 'Give me that-ACC.FEM. salt-ACC.FEM.', in some substandard dialects of Serbian (e.g. the *kosovsko-resavski* dialect) it is possible to hear the incorrect variant *Daj mi taj so!* 'Give me that- ACC. MASC. salt-ACC.

MASC'. Such examples may be treated as evidence for the fact that masculine is still more productive and the unmarked gender in respect to the others two. Similarly, dialectal class shifts from the unproductive II.2 to the more productive masculine microclass I.1a are attested for other nouns as well, such as for example the noun *krv* 'blood', e.g. *Pošo*-MASC. *mi krv* NOM. MASC. 'I am bleeding', instead of the grammatically correct *Pošla*- FEM. *mi krv*-NOM.FEM.

E) The hierarchically lowest criterion is word-formation productivity of affixations. Although it shows direct productivity evidence for word formation, it may also be useful for the inflection, because it can indicate stability of an inflectional microclass (cf. Dressler, 2003; Dressler & Thornton, 1996). For example, the productive class II.1a of the masculine nouns in *-a* with the masc. agent suffix *-ista*:

(43) *taks-ista* 'taxi driver', follow the declension of the respective nouns of this class II.1a₃ (professions) but with the Nominative plural in *-i* (class I.1a)

Certain older foreign suffixes show unequivocal derivational integration into one of the most productive classes, and the only productive feminine class, namely II.1. This is also an example of the accommodation to a pre-existing suffixation schema (Eng. suffix *-ism* is accommodated as *-izam* in Serbian or Croatian; Lat. *-tio*, *-tionis*/Eng. *-tion*→SC. *-cija*)

(44) Eng.²⁶ *transforma-tion*> fem. Sg. *transforma-cija*, Pl. *transformacij-e*; Eng. *situa-tion*> fm. Sg. *situa-cija*, Pl. *situacij-e*; Eng. *Struc-ture*> fem. Sg. *struk-tura*, Pl. *struktur-e* (class II.1).

Also Serbian 'motion suffixes' (or gender shifts) are connected to the two most productive classes, e.g. *-ica*, *-ka*, *-kinja* (class II.1) for feminine and *-ac* (class I.1) for masculine:

(45) *lav* 'lion'> *lav-ica* 'leanness'

(46) *lis-ac* 'male fox', *lis-ica* 'female fox':

As Dressler (2003) claims, the establishing of the inflectional productivity scale is very important not only for the language as a norm, but also for the language on the level of its performance. With such a scale, it is perfectly clear which of the rules are (more/less) productive and which are (more/less) unproductive. According to the proposed explanation, the functional difference between productive and unproductive rules lies in fulfilling of the syntactic function. A productive rule accomplishes this function by fitting and adapting new words to the specific patterns, so that appropriate morphosyntactic categories (tense, case, number, etc.) are expressed. In contrast, this function is not fulfilled by an unproductive rule. In such a case, there are two possibilities: either a more productive rule takes over, or the

²⁶ These nouns are of Latin origin and they came into the Serbian language from English (Filipovic, 1990).

loan word in question remains uninflected. Thus, uninflected loan-words are called foreignisms, as they remain partially or completely unintegrated into the grammatical system of the language in question. Since Serbian belongs to highly inflecting languages, unintegrated loan words and abbreviations are extremely rare and strange for its syntactic system. Consequently, they are all put into the most productive inflectional classes and microclasses, as shown by numerous examples in this section.

4.2. An overview of Serbian verbal morphology

The Serbian verb system has rich morphology as well, since this verbal system marks different morphological categories (e.g. person, number, tense, aspect, mood, voice and valence). Gender is visible in participles that are used in some analytic tenses. Thus, one verb can appear in all persons, numbers, tenses and other relevant verbal categories. These categories are mainly marked by an inflectional suffix. An overview of the morphological categories is presented below:

- person: 1st, 2nd, 3rd
- number: singular and plural
- tense:
 - a) finite synthetic: present, aorist, imperfect,
 - b) finite analytic: perfect, plusquamperfect, future I

Among them, only present and perfect are fully productive, future I is less productive, whereas aorist, imperfect and plusquamperfect are unproductive and are often labeled in grammars as 'old-fashioned'.

c) infinite: infinitive, two 'verbal adjectives' (active past participle and passive past participle), two verbal adverbs (present and past)

Only the past participle active is productive, because it is used to form perfect tense, which is the most productive past tense.

- aspect (perfective and imperfective): This Serbian category is mostly expressed by means of derivational affixes, e.g. imperf. *čit-a-ti* 'to read' *pre-pliv-av-a-ti* 'to swim'

perf. *pro-čit-a-ti* *pre-pliv-a-ti*

On the other hand, in aorist and imperfect, aspect is already expressed inflectionally.

- mood: imperative is productive; conditional, future II unproductive (no distinction indicative vs. subjunctive);
- voice (active, passive), only active productive.
- valence (transitive, intransitive, reflexive)

Morpho-syntactically, the finite verb agrees with nouns in regard to person and number. In analytic tenses, formed by an auxiliary and past participle, there is an agreement in gender as well, which can be seen in table 3. Examples of the two most productive tenses (present and perfect) are given below, exemplified by the verb *rad-i-ti* 'to work'.

Present Tense

	Singular	Plural
1.P	<i>rad-i-m</i>	<i>radi-i-mo</i>
2.P.	<i>rad-i-š</i>	<i>rad-i-te</i>
3.P.	<i>rad-i</i>	<i>rad-e</i>

In addition to the ending –e for 3P.Pl. present, two other endings (-u and -ju) exist in Serbian.

Perfect

AUX *biti* 'to be' (Table 2) + Past participle active (table 3)

AUX: <i>biti</i>	SG	PL
1.P	sam	smo
2.P.	si	ste
3.P.	je	su

Table 2: auxiliary verb *biti* 'to be'
(Present tense, clitic forms)

Past participle active: <i>raditi</i>	masculine	feminine	neuter
Singular	<i>rad-i-o</i>	<i>rad-i-la</i>	<i>radi-i-lo</i>
Plural	<i>rad-i-li</i>	<i>rad-i-le</i>	<i>rad-i-la</i>

Table 3: The formation of the past participle of the verb *raditi* 'to work'

Serbian verbs have thematic vowels and thematic consonants /j,v,n/ which are units that intervene between the root and tense suffixes (e.g. *gled-a-ti* 'to look', *rad-i-ti* 'to work', *mak-nu-ti* 'to move'). They are important because they are responsible for the choice of a conjugation pattern a given verb belongs to. This will be explained in detail in the following section (4.2.1). For the formation of all verbal forms, we need the infinitive or present stem combined with inflectional endings specific for the tense in question. In Serbian, there are two endings for infinitive: -ti (*radi-ti* 'to work', *gleda-ti* 'to look') and -ći (e.g. *do-ći* 'to come',

sti-ći ‘to arrive’). An infinitive stem of the verbs in *-ti* is simply formed by taking out the ending *-ti*, whereas for those ending in *-ći*, we use the form of the 1P. Sg. aorist without the ending *-oh* (e.g. *dođ-oh* ‘I have come’), here *dođ-*. For a present stem, we take the form of the 2P.Sg. present without the personal ending (*-š*) (e.g. 2P.Sg.Pres. *rad-i-š*), i.e. the present base would be: *radi-*. More on the existing verbal classes in Serbian will be said in the following section with regard to the productive patterns only.

4.2.1. Inflectional productivity of Serbian verbal classes

Language specific system adequacy of the model of Natural Morphology is designed on the basis of productive classes and microclasses, as illustrated for the nominal morphology of the Serbian language. These productive microclasses have the central role in contrast to unproductive ones (e.g. suppletive paradigms), whose role is only peripheral (Dressler et al., 1996). Psycholinguistic models show that such unproductive and isolated paradigms (e.g. German irregular verbs) must be lexically stored and productive paradigms may be not.

The establishment of inflectional classes can follow historical tradition. On the other side, there are different proposals which are based on simple criteria of the distribution of patterns or rules, without consideration for productivity. For example, the concept of default is based on descriptive simplicity, without taking into consideration productivity of respective forms. In contrast to such models, Dressler et al. (1996) postulate that productivity is both a primitive and a core property of inflectional morphology.

The productivity of verbal classes may be very well studied in terms of criteria for inflectional productivity exposed previously (section 4.1.3). Among them, loan verbs with unfitting properties as well as examples from class shift are the most relevant for the study of productive verbal classes. For example, English and German verbs have no thematic vowel, which represents an unfitting property for Serbian. Therefore, when adapting such verbs to the Serbian verbal morphology, a corresponding thematic vowel has to be added. A term ‘corresponding’ means one that best manages to diminish the foreign origin of the LW in question, which is achieved only with the most natural, most unmarked and the most common or suitable one e.g.:

(1) Eng. *to dribble* > Serb. *dribl-a-ti* (with the thematic vowel *-a*, 1P.Sg.Pres. *dribl-a-m*); Ger. *schminken* (sich) > *šmink-a-ti* (se), 1P.Sg.Pres. *šmink-a-m* (se)

(2) Ger. *sprengen* > Ser. *špeng-ov-a-ti* ‘to blow sth up’ (with the infix *-ov-*, and with the thematic vowel *-a*: 1P.Sg.Pres. *špeng-uje-m*);

(3) Eng. 'to bluff' > *blef-ir-a-ti* (1P.Sg.Pres. *blef-ir-a-m*)

Examples of class shifts from less productive to more productive ones are frequently found in some substandard Serbian dialects. The most common among such shifts happen in the third person plural of the present tense, as illustrated in the following examples.

(4) e.g. *rad-i-ti* 'to work', 3P.Pl. **rad-u*, instead of the correct ending –e, *rad-e*. Similarly, the verb *razum-e-ti* 'to understand' frequently shows the substandard forms, e.g. **razum-u* instead of the correct *razum-e-ju*.

These examples show that among three possible third person plural endings in the present tense, the most unmarked and natural one is –u, since all attested class shifts go towards those microclasses that have –u in the third person plural, irrespective of thematic vowels.

In accordance with the previously presented concepts and criteria, I present here the most productive verbal classes in Serbian (based on the classification proposed for Croatian, cf. Dressler et al., 1996), together with examples of established productive verbal microclasses proposed for other languages. As sources for such an analysis, I mainly use the article on Polish/Croatian inflectional verbal classes (Dressler et al., 1996), articles on verbal class division from other languages, grammars by Stanojčić & Popović (1989) and Stevanovic (1964), publications on loanwords (Filipović, 1990) and native speakers of Serbian (both standard and substandard).

The traditional division of the verbal inflectional classes in Serbian comes from the work done by Stevanović (1964). There are seven inflectional classes of verbs, classified according to their infinitive and present stems. There is also a proposed classification of Croatian inflectional classes in terms of Natural Morphology (Dressler et al., 1996) and grammatical productivity, which differs from the previously mentioned traditional classification. The outcome of this new division within the framework of Natural Morphology model can be adapted for the Serbian inflectional system as well, in order to describe the most productive verbal classes.

Cross-linguistically, Germanic languages have few productive verbal microclasses, Romance language have more of them, whereas Slavic languages have many more productive verbal microclasses. Slavic productive microclasses are more dissimilar among themselves than the productive microclasses in Romance languages for examples, because they belong to different macroclasses. An overview of the classifications from different languages can be seen in the following table (4):

languages	Number of productive microclasses	examples
English, Dutch, German	one	weak verbs
French (Kilani-Schoch&Dressler, 2005)	three productive microclasses	1) <i>parl-er</i> 'speak', 1.Sg. <i>je parle</i> [parl] 2) <i>sem-er</i> [s(±)me] 'sow', <i>je sème</i> [sem] 3) <i>céd-er</i> [sede] 'give up', <i>je cède</i> [sEd]
Italian (Spina & Dressler, 2003)	two productive microclasses	1) the fully productive microclass of <i>parl-are</i> 'speak' 2) weakly productive one of Inf. <i>fin-i-re</i> 'end', 1.Sg.Prs.Ind. <i>fin-i-sc-o</i> , 1.Sg. Passato Remoto <i>fin-i-i</i> , PPP <i>fin-i-to</i>
Slovene (Dressler & Makovec-Černe, 1995)	four microclasses	1) Inf. <i>dél-a-ti</i> 'work', Part. <i>dél-a-l</i> , 3.Sg.Prs. <i>dél-a</i> , Imp. <i>dél-a-j</i> ; 2) Inf. <i>mísl-i-ti</i> 'think', Part. <i>mísl-i-l</i> , 3.Sg. = Imp. <i>mísl-i</i> ; 3) Inf. <i>bóks-n-i-ti</i> 'box (pfv.)', Part. <i>bóks-n-i-l</i> , 3.Sg. <i>bóks-n-e</i> , Imp. <i>bóks-n-i</i> ; 4) Inf. <i>kup-ov-á-ti</i> 'buy', Part. <i>kup-ov-á-l</i> , 3.Sg. <i>kup-új-e</i> , Imp. <i>kup-új</i> .
Polish (Dressler et al., 1997; Dressler et al., 1996)	seven productive microclasses	the forms given are Inf., 1.Sg., 3.Sg., 3.Pl.Prs., 2.Sg.Imp., 1.Sg. masc. Pret, PPP: 1) <i>kup-ow-a-Ė</i> 'buy', <i>kup-uj-ĭ/-e</i> , <i>kup-uj-±</i> , <i>kup-uj</i> , <i>kup-ow-a- -em</i> , <i>kup-ow-a-n-y</i> ; 2) <i>pis-yw-a-Ė</i> 'write (iterative)', <i>pis-uj-e</i> , etc.; 3) <i>siw-ie-Ė</i> 'become grey', <i>siw-ie-j-ĭ/-e/-±</i> , <i>siw-ie-j</i> , <i>siw-ia- -em</i> , <i>siw-ia-n-o</i> ; 4) <i>krzyk-n-±-Ė</i> 'cry (pfv.)', <i>krzyk-n±/-ie/-±</i> , <i>krzyk-n-ij</i> , <i>krzyk-n-±--em</i> , <i>krzyk-n-i-ĭt-y</i> ; 5) <i>waø-y-Ė</i> 'weigh', <i>waø-ĭ</i> , <i>wa-øy</i> , <i>waø-±</i> , <i>waø</i> , <i>waø-y- -em</i> , <i>waø-on-y</i> ; 6) <i>nos-i-Ė</i> 'carry', <i>noszĭ</i> , <i>nos-i</i> , <i>nosz-±</i> , etc.; 7) <i>koch-a-Ė</i> 'love', <i>koch-a-m</i> , <i>koch-a</i> , <i>koch-a-j-±</i> , <i>koch-a-j</i> , <i>koch-aø- em</i> , <i>koch-a-n-y</i> .
Russian (Dressler & Gagarina, 1999)	four productive microclasses	The given forms are: infinitives of LWs or neologisms: 1) <i>kontakt-ov-at'</i> , <i>boks-ir-ov-at</i> 'contact; box', 2) <i>klik-nu-t'</i> , <i>kopir-nu-t'</i> 'click; copy (< G. <i>kopier-en</i>)', 3) <i>faks-it'</i> , <i>print-it'</i> , 'fax; print out' 4) <i>tap-at'</i> 'tape', <i>kompromiss-ni-Ėat'</i> 'to tape; compromise'.
Croatian (cf. Dressler et al., 1996)	five productive microclasses (I. 1. a ²⁷ , I. 1. b, II. 1. a, III.1., IV)	The forms given: Inf., 1.Sg., 3.Sg., 3.Pl.Prs., 2.Sg.Imp., 3. Fem. Sg, Past Part.: 1) <i>kup-ov-a-ti</i> , <i>kup-uj-e-m</i> , <i>kup-uj-u</i> , <i>Kup-uj!</i> <i>Kup-ov-a-la</i> 'to buy' 2) <i>do-pis-iv-a-ti</i> , <i>dopis-uj-em</i> , <i>dop-is-uj-</i> , <i>dopis-uj!</i> , <i>dopis-iv-a-la</i> , 'to correspond' 3) <i>mak-nu-ti</i> , <i>mak-n-em</i> , <i>mak-n-u</i> , <i>mak-n-i!</i> , <i>mak-nu-la</i> , 'to move' 4) <i>nos-i-ti</i> , <i>nos-i-m</i> , <i>nos-e</i> , <i>nos-i!</i> , <i>nos-i-la</i> 'to carry' 5) <i>gled-a-ti</i> , <i>gled-a-m</i> , <i>gled-a-ju</i> , <i>gled-a-j!</i> , <i>gled-a-la</i> 'to look'

Table 4: Productive verbal microclasses in several languages

²⁷ The first number indicates macroclass, the second number stands for a class whereas the small letter indicates the microclass.

In Croatian²⁸ there are four major macroclasses with productive microclasses, recessive, isolated and suppletive paradigms, as established in the study of Dressler et al. (1996). Although such a classification of verbal classes differs from the traditional one, it has its advantages since it illustrates in a better way one of the crucial morphological concepts, namely productivity. Since Serbian has a highly rich verbal morphology, the representation of all macro- and microclasses would be too extensive and not relevant for this kind of study on productivity. Therefore, only an overview of how productive microclasses are formed and systematized will be given (table 4). In accordance with the scale of criteria for inflectional productivity presented in section 4.1.3, this classification confirms that the main criteria for establishing productive classes are found in the integration of loan verbs, followed by inflection of neologisms and slang forms. Results of the study (Dressler et al., 1996) show that the majority of loan verbs are integrated into these five productive microclasses (a-e). To illustrate this, more examples of productive microclasses (with the forms given in infinitive and in the present tense) with indigenous, loan or slang verbs are presented as follows. For the simple illustration, I will describe these productive microclasses (abbr. PM) specifying only the thematic vowel/consonant in infinitive (Ti) and in present (Tp), with the relevant endings in present for the 1P.Sg. 3P.Sg. and 3P.Pl.

a) Productive microclass I. 1. a, Ti: -ov- , Tp -uj-, 1P.Sg. -e-m, 3P.Sg. -e, 3P.Pl. -u.

(5) indigenous verb: e.g. *kup-ov-a-ti* 'to buy'- 1P.Sg. *kup-uj-e-m*, 3P.Pl. *kup-uj-u*

(6) loan verbs: Eng. 'to go shopping' > *šoping-ov-a-ti*, e.g. 1P.Sg. *šoping-uj-e-m*; Eng. 'to flirt' > *flert-ov-a-ti*, 1P.Sg.Pres. *flert-uj-e-m*; Eng. 'to box' > *boks-ov-a-ti*, 1P.Sg.Pres. *boks-uj-e-m*; Eng. 'to lynch' > *linč-ov-a-ti*, 1P.Sg.Pres. *linč-uj-e-m*; Eng. 'to start' > *start-ov-a-ti*, 1P.Sg.Pres. *start-uj-e-m*; Eng. 'to mix' > *miks-ov-a-ti*, 1P.Sg.Pres. *miks-uj-e-m*; Eng. 'to roll' > *rol-ov-a-ti*, 1P.Sg.Pres. *rol-uj-e-m*; Ger. 'stellen' > *štel-ov-a-ti*, 'to adjust', 1P.Sg.Pres. *štel-uj-e-m*; Ger. 'schmecken' > *šmek-ov-a-ti*, 'to taste', 1P.Sg.Pres. *šmek-uj-e-m*;

(7) Slang neologisms: Eng. 'to upload' > *aploud-ov-a-ti*, 1P.Sg.Pres. *aploud-uj-e-m*; Eng. 'to add' > *ed-ov-a-ti*, 1P.Sg.Pres. *ed-uj-e-m*; Eng. 'to save' > *sejv-ov-a-ti*, 1P.Sg.Pres. *sejv-uj-e-m*; Eng. 'to post' > *post-ov-a-ti*, 1P.Sg.Pres. *post-uj-e-m*; reg. *anpas-ov-a-ti* (< Ger. *anpassen* 'to fit'), 1P.Sg.Pres. *anpas-uj-e-m*; Eng. 'to bold' > *bold-ov-a-ti*, 1P.Sg.Pres. *bold-uj-e-m*; Eng. 'to tag' > *tag-ov-a-ti*, 1P.Sg.Pres. *tag-uj-e-m*; Eng. 'to like' > *lajk-ov-a-ti*, 1P.Sg.Pres. *lajk-uj-e-m*; Eng. 'to fill' > *fil-ov-a-ti*, 1P.Sg.Pres. *fil-uj-e-m*, 3P.Pl.Pres. *fil-uj-u*.

²⁸ The entire classification of the productive verbal classes in Croatian is taken from Dressler et al. (1996). However, as already explained in chapter 3, Croatian data can be used for the explanation of the corresponding concepts in Serbian, and vice versa. Therefore, I use these data, adjusting them, if needed, to the inflectional system of the Serbian variant specifically.

b) Productive microclass I. 1. b, Ti: -iv-, Tp -uj-, 1P.Sg. -e-m, 3P.Sg. -e, 3P.Pl. -u.

(8) indigenous verb: e.g. *do-pis-iv-a-ti* 'to buy'- 1P.Sg. *dopis-uj-e-m*, 3P.Pl. *dopis-uj-u* 'to correspond'; impfv. *po-traž-iv-a-ti*- 1P.Sg. *po-traž-uj-e-m*, 3P.Pl. *po-traž-uj-u* 'to look for';

This pattern shows a very productive indigenous way of perfective-imperfective formation (i.e. from the perfective verb *do-pis-a-ti* 'to correspond').

(9) If possible, loan verbs undertake this pattern for formation of the corresponding imperfective variant of the same verb, e.g. impr. Iterative *po-dribl-iv-a-ti* 'to dribble-IMPERF.' < *po-dribl-a-ti* 'to dribble-PERF.'

c) Productive microclass II.1.a, Ti: -nu-, Tp: -n-, 1P.Sg. -e-m, 3P.Sg. -e, 3P.Pl. -u.

(10) indigenous verbs: e.g. *trep-nu-ti* 'to blink', 1P.Sg. *trep-n-e-m*, 3P.Pl. *trep-n-u*; *zviz-nu-ti* 'to hit', 1P.Sg. *zviz-n-e-m*, 3P.Pl. *zviz-n-u*; *stis-nu-ti* 'to squeeze', 1P.Sg. *stis-n-e-m*, 3P.Pl. *stis-n-u*;

This pattern is very productive for onomatopoeic verbs in perfective aspect, such as for example *pljus-nu-ti* 'to hit' (< *pljus*), *skljoc-nu-ti* 'to click' (< *skljoc*), *bljuc-nu-ti* 'to spit' (< *bljuc*).

(11) loan verbs: Eng. 'to shoot' > *šut-nu-ti*, 1P.Sg.Pres. *šut-n-e-m*; Eng. 'to box' > *boks-nu-ti*, 1P.Sg.Pres. *boks-n-e-m*; Ger. '*schmuggeln*' > *šmug-nu-ti* 'to run away', 1P.Sg.Pres. *šmug-n-e-m*; Eng. 'to flip' > *flip-nu-ti*, 'to become crazy', 1P.Sg.Pres. *flip-n-e-m*; Eng. 'to click' > *klik-nu-ti*, 'to become crazy', 1P.Sg.Pres. *klik-n-e-m*.

d) Productive microclass III.1., Ti: -i-, Tp: -i-, 1P.Sg. -i-m, 3P.Sg. -i, 3P.Pl. -e.

(12) indigenous verb: e.g. *nos-i-ti* 'to carry', 1P.Sg. *nos-i-m*, 3P. Pl. *nos-e*; *snjim-i-ti* 'to record', 1P.Sg. *snjim-i-m*, 3P. Pl. *snjim-e*; *pal-i-ti* 'to burn', 1P.Sg. *pal-i-m*, 3P.Pl. *pal-e*; *ruš-i-ti* 'to destroy', 1P.Sg. *ruš-i-m*, 3P.Pl. *ruš-e*; *u-lenj-i-ti se* 'to get lazy', 1P.Sg. *ulenj-i-m se*, 3P.Pl. *ulenj-e se*; *opelješ-i-ti* 'to steal', 1P.Sg. *opeljš-i-m*, 3P.Pl. *opelješ-e*;

(13) Neologism slangs (indigenous): e.g. Eng. *šiz-i-ti* 'to freak out', 1P.Sg. *šiz-i-m*, 3P.Pl. *šiz-e*; *ćop-i-ti* 'to steal', 1P.Sg. *ćop-i-m*, 3P.Pl. *ćop-e*; *u-musav-i-ti* 'to make dirty', 1P.Sg. *musav-i-m*, 3P.Pl. *musav-e*;

(14) Loan verbs: Ger. *Schraube* 'screw' > *šraf-i-ti*, 1P.Sg.Pres. *šraf-i-m*, 3P.Pl. *šraf-e*; Fr. *sénile* 'senile' > *po-senil-i-ti* 'to become senile', 1P.Sg. *po-senil-i-m*, 3P.Pl. *po-senil-e*; Fr. *clochard* 'tramp' > *klošar-i-ti* 'to behave like a low life', 1P.Sg. *klošar-i-m*, 3P.Pl. *klošar-e*.

e) Productive microclass IV Ti: (ir)-a-, Tp: (ir)-a-, 1P.Sg. -a-m, 3P.Sg. -a, 3P.Pl. -a-ju.

(15) indigenous verbs: e.g. *gledati* 'to look', 1.p.Sg. *gled-a-m*, 3.p.Pl. *gled-a-ju*; *glup-ir-a-ti se* 'to fool around', 1.p. Sg. *glup-ir-a-m se*, 3.p. Pl. *glup-ir-a-ju se*;

(16) LWs: Eng. 'to dribble' > *dribl-a-ti*, 1P.Sg. *dribl-a-m*, 3P.Pl. *dribl-a-ju*; Eng. 'knockout' > *nokaut-ir-a-ti*, 1P.Sg. *nokaut-ir-a-m*, 3P.Pl. *nokaut-ir-a-ju*; Eng. 'to serve' / Ger. '*servieren*' > *serv-ir-a-ti*, 1P.Sg. *serv-ir-a-m*, 3P.Pl. *serv-ir-a-ju*; Eng. 'to park' / Ger. '*parkieren*' > *park-ir-a-ti*,

1P.Sg. *park-ir-a-m*, 3P.Pl. *park-ir-a-ju*; Eng. 'to check in'> *ček-ir-a-ti se*, 1P. Sg. *ček-ir-a-m se*, 3P. Pl. *ček-ir-a-ju se*; Eng. 'to lobby'/ Ger. 'lobbyieren'> *lob-ir-a-ti*, 1P.Sg. *lob-ir-a-m*, 3P.Pl. *lob-ir-a-ju*; Eng. 'to zoom'> *zum-ir-a-ti*, 1P.Sg. *zum-ir-a-m*, 3P. Pl. *zum-ir-a-ju*; Eng. 'to dress'> *dres-ir-a-ti*, 1P.Sg. *dres-ir-a-m*, 3P. Pl. *dres-ir-a-ju*; Fr. 'bloquer'/Ger. 'blockieren'>*blok-ir-a-ti*, 1P. Sg. *blok-ir-a-m*, 3P.Pl. *blok-ir-a-ju*; Eng. 'to test'> *test-ir-a-ti*, 1P.Sg. *test-ir-a-m*, 3P. Pl. *test-ir-a-ju*; Eng. 'to parry'/ Ger. 'parieren'> *par-ir-a-ti*, 1P.Sg. *par-ir-a-m*, 3P.Pl. *par-ir-a-ju*; Ger. 'zementieren' > *cement-ir-a-ti* 'to cement', 1P.Sg. *cement-ir-a-m*, 3P.Pl. *cement-ir-a-ju*; Eng. 'to shampoo'> *šampon-ir-a-ti*, 1P.Sg. *šampon-ir-a-m*, 3P.Pl. *šampon-ir-a-ju*; It. 'durare'> reg. *dur-a-ti* 'to last', 1P.Sg. *dur-a-m*, 3P.Pl. *dur-a-ju*; Ger. 'sparen'> *špar-a-ti* 'to save', 1P.Sg. *špar-a-m*, 3P.Pl. *špar-a-ju*;

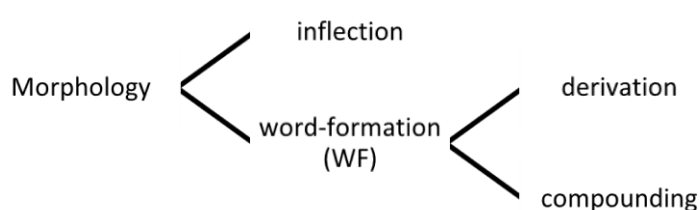
(17) Slang neologisms: *smar-a-ti* 'to bore sb silly', 1P.Sg. *smar-a-m*, 3P.Pl. *smar-a-ju*; *mod-ir-a-ti se* 'be fashionable', 1P.Sg. *mod-ir-a-m se*, 3P.Pl. *mod-ir-a-ju se*; Eng. 'to fix'> *fiks-a-ti* 'to get a fix (drug)', 1P.Sg. *fiks-a-m*, 3P.Pl. *fiks-a-ju*; *zum-a-ti* 'to play Zuma (computer game)', 1P.Sg. *zum-a-m*, 3P.Pl. *zum-a-ju*;

This microclass contains also variants (so-called *doublet* forms) of verbs from the PM I.1.a (*start-ov-a-ti* vs. *start-a-ti*, *boks-ov-a-ti* vs. *boks-a-ti*). Moreover, verbs from this PM IV containing thematic –ir- (e.g. *transport-ir-a-ti*< Eng. 'to stransport') may sometimes have doublet forms of verbs from the PM I.1.a (e.g. *transport-ov-a-ti*). Among these doublet variants, those from PM IV (e.g. *dribl-a-ti* or *kidnap-ir-a-ti*) are identified as more common for Croatian, whereas those verbs belonging to PM I.1.a (*dribl-ov-a-ti* or *kidnap-ov-a-ti*) are more common for Serbian. Generally speaking, among these five productive microclasses, the two most productive are PMs IV and I.1.a. A small difference may be found by judging doublet forms of loan verbs i.e. PM IV is a slightly more preferred verbal microclass in Croatian, whereas in Serbian the most preferred one by native speakers is PM I.1.a.

5. Derivation vs. Inflection

5.1. Traditional approaches to distinction derivation vs. inflection

According to the traditionally accepted classification, morphology is divided into two parts inflection and word-formation. Word formation is further divided into derivation and composition (see picture 2). However, a precise defining of these core concepts has created a long discussion among linguists. Simply speaking, word formation is about derivational morphology, compounding and some similar processes (e.g. blending, clipping etc). Roughly speaking, whenever the word-class is changed, we speak about derivation.



Picture 2: Scheme of morphological structure

On the other hand, Anderson (1982) defined inflection very simply, i.e. he stated that ‘inflectional morphology is what is relevant to the syntax.’ However, if we compare the transpositional function of word formation, which allows words to appear in different sentence functions, to Anderson’s definition, the logical conclusion would be that word formation may be a matter of inflectional morphology, which is in contrast to the traditional view (Bauer, 2004).

The question about the precise boundary between different morphological concepts (e.g. inflection vs. derivation or derivation vs. compounding) has been much discussed among morphologists. There are lots of controversial views, such as the one proposed by Haspelmath (1996), who argued that there are cases of word-class changing inflection (e.g. the formation of English adverbials in *-ly*).

There are other interpretations of these two very important morphological concepts. For example, Booij (1996) argues that there are two different kinds of inflection, contextual and inherent. Contextual inflection is determined by concord and government within the sentence. In other words, it deals with phenomena such as, adjectival agreement with nouns for number and gender (in Romance languages), or for number, gender and case (in Slavic languages), verbal agreement with their subjects or objects in number, person, gender in lots of languages. This inflectional type includes also subjunctive marking in some languages,

where the subjunctive form is demanded by a verb or various types of expressions or constructions in a matrix clause, e.g. in Italian *non sono sicuro che tu abbia ragione* 'I'm not sure that you're right', where the subjunctive form of *have* is demanded by the construction *non sono sicuro che* 'I'm not sure that'. Simply speaking, this kind of inflection is required by syntax. On the other hand, inherent inflection is not constrained by the structure of the sentence. The most common examples given by Booij are number (on nouns) or absolute tense (on verbs). Depending on the speakers' intentions or real-world situations the speaker chooses between plural or singular nouns, or between present, past and future tenses. Thus, it can be said that inherent inflection refers to pure morphological categories without strict dependence on sentence structure. In other words, inherent inflection is important for syntax, but it is not required by sentence structures. However, Booij's (1996) proposal is not always able to make a clear distinction between the two kinds of inflection, because there are some cases where the same formal category in one context may belong to inherent inflection and in another context to the contextual one (e.g. the use of subjunctive; the use of relative tense, i.e. past tense needs past perfect in the subordinate clause in order to express anteriority).

Regarding the definition of word formation, Bauer (2004) explains it in terms of its two main functions:

1) a function of lexical enrichment, whereby new words are coined. This kind of derivation has traditionally been considered to have the function of expanding the lexicon by modifying the meaning of existing lexemes (Bauer, 2004). There are word-class changing affixes that have their own meaning (e.g. *-able* in English means 'capable of, suitable for, able to', V>A: *read>read-able*). The most common examples are gender-marking morphology, morphology which marks agents, patients, instruments, locations, modal-marking on adjectives (cf. *eatable, payable*), negation (e.g. *dissatisfaction*) etc.

2) a transpositional function, whereby already existing lexemes appear in a new word class in order to obtain the same meaning being transferred to a new function in a sentence. In other words, these affixes are word-class changing (V>N: *arrive>arriv-al*), but they have no meaning, i.e. their function is only to contribute to transposition of the word-class and therefore the term transpositional morphology has been proposed by Bauer (2004) in order to refer to such coinages.

There are some particular cases, which are considered to be atypical of inflection or derivation, such as the case of evaluative morphology (the most common are diminutives and augmentatives). As explained by Scalise (1984), evaluative affixes are often transparent to the word class and/or gender of the base. In many languages diminutivization is a highly productive derivational process. Another example shows only a change of sub-type of word class, such as 'valency changing' morphology for verbs (causatives, intransitivisers, transitivisers). Such changes are very common and complex for highly inflecting languages,

as it is the case for example in Serbian. Such changes are usually not morphologically marked in English (e.g. *The dog walked.* vs. *I walked the dog.* Or *Flowers grow on this bank* vs. *I grow flowers*). Thus, for such examples, Bauer (2004) proposed a label 'valency-changing' morphology.

Taking into account all previously described classes of morphology, it is not completely accurate to speak only about inflections vs. derivation, but rather one more precise distinction of subcategories needs to be done. Therefore, Bauer (2004) suggests that we should speak about at least six different types of morphology: contextual, inherent, transpositional, valency changing, evaluative, lexicon expanding. All these categories may be discussed and described in terms of the traditionally used criteria for distinguishing derivation from inflection. For example, contextual morphology is connected to the syntax in a narrow sense, i.e. it is very important for agreement and government. Regarding the maintaining of the same lexeme, this function is fulfilled only by contextual and inherent morphology, whereas other types create new lexemes. Moreover, changing of the word class is obtained in cases of the transpositional and lexicon expanding morphology, whereas in inherent, contextual and valency changing morphology the word class is maintained after the application of morphological process. Even according to this view, there are 'border' cases, which show certain degrees of inconsistencies, e.g. evaluative morphology which is typically class maintaining, even though cases of class changing evaluative processes are attested crosslinguistically (V>N: Ser. *zanovetati* 'carp'> N. DIM HYP *zanovet-ak*, used usually for girls that complain a lot). Grammatical function is present in inherent, contextual, transpositional and valency changing morphology, whereas lexical function only in evaluative and lexicon expanding morphology. Moreover, lexicon-expanding morphology is much less automatic or less paradigmatic (cf. Bauer, 2004) than other types, because, if there is some empty category in a certain language, it is due to non-linguistic reasons (e.g. society needs). Bauer (2004) suggests that productive and unproductive processes in derivation are to be distinguished very carefully, because there are affixes which are used productively on certain bases in order to obtain certain category (e.g. *-ity* suffixation for abstract nouns in English). On the hand, when we have the same affix used on other bases, it may not present the same degree of productivity, or it may be completely unproductive. Hence, it means that we must be very precise when talking about productive derivational processes and avoid speaking about one affix as productive or unproductive, but always in connection to the obtained meaning or category.

5.2. Derivation-Inflection Continuum (within NM)

We have previously seen some attempts to make a more precise distinction between derivational and inflectional processes proposed in the morphological literature or even to introduce more specific subcategories (e.g. cf. Bauer, 2004: transpositional, valency changing morphology). However, sometimes that whole terminological variety is not very transparent and we need better solutions for different kinds of inflectional or derivational processes, and especially those that are situated somewhere ‘in the middle’. Therefore, being based on gradualness, the model of Natural Morphology has proposed a gradual continuum also between morphology and syntax, namely inflection-derivation-semiaffixation-compounding-juxtaposition-phrasal syntax (cf. Dressler, 2012). There is no strict borderline between each of these submodules, but there are always categories that are situated in the middle, showing properties of both poles (e.g. inflection vs. word formation). Because of that reason, Dressler (1989) argued for the so-called derivation-inflection continuum. It is actually a gradual scale, with prototypical categories at opposite extremes and non-prototypical categories in between: prototypical derivation (e.g. class-changing formation A>N)-nonprototypical derivation (e.g. diminutivization in Slavic languages)-nonprototypical inflection (e.g. plural formation, infinitive nouns)-prototypical inflection (e.g. case). Prototypical derivation is word-class changing e.g. Ser. adj. *mlad* ‘young’> n. *mlad-ost* ‘youth’, whereas prototypical inflection is *per definitionem* word-class preserving. Consequently, derivational types that preserve word-classes in question are said to have a non-prototypical status, e.g. n. *knjiga* ‘book’→ n. *knjiž-ara* ‘bookshop’. Since their neighboring type is non-prototypical inflection, it means that these two categories share some common properties. Booij’s terms inherent and contextual inflection correspond to the non prototypical and prototypical inflection, respectively.

Non-prototypical derivation is best represented by evaluative morphology, because it shows both some inflectional features as well as derivational ones. This makes the border between these two morphological categories blurred and confirms the fact that an inflection-derivation continuum needed to be established. More on Serbian evaluative suffixes and their non-prototypical derivational properties will be discussed in sections 6.3.1. and 6.3.2.

6. Productivity in Derivation

'A rule is productive if it is regularly and actively used in the creation of totally new words.'

(Spencer 1991; 49)

'A word formation process is productive if it can be used synchronically in the production of new words.'

(Bauer 1983; 18)

The main function of word formation rules (abbr. WFRs) is that of forming potential words, i.e. of lexical enrichment. Their intrinsic characteristic is being productive, which is also their prototypical property (Dressler, 2007). Since prototypes always include gradulanness, productivity is defined as a gradual concept which can be explained in terms of a scale of criteria that show higher or lower degrees of productivity. Such a scale of grammatical productivity in inflection Dressler (2003) is shown and discussed in section 4.1.3 of this Master Thesis. In this section as follows, the same scale will be used, but this time with regard to derivation. As already mentioned before, the level of structural obstacles that one WFR has to overcome in the morphological adapting of 'new words' is the main criterion for establishing such a scale of grammatical productivity (Dressler, 2007). The term 'new word' means exactly the same as used for the scale of grammatical productivity in inflection, namely it refers to loan words, neologisms, abbreviations, etc.

Productivity in word formation has two dimensions- syntagmatic and paradigmatic. As previously explained, the syntagmatic dimension refers to an individual WFR and its connection to input (base words)-output (derived words). On the other hand, WFRs may be applied to more than one base word, or there are more than one word formation rule competing for the same input (rule competition or so-called rivalry, Bauer, 2001). This represents the paradigmatic dimension of grammatical productivity and rule application. The systematic representation of various types of word formation rules and their application will be given in the following sections, in the classification proposed by Dressler (2007). Other extragrammatical formations, such as abbreviations, blends, clippings, phonaesthemes and similar formations, are formed by usual word formation rules and are said to show rather 'special' word formation behavior. Thus, these formations will not be taken into consideration in the study of productivity in word formation.

6.1. The syntagmatic dimension of productivity in derivation

The established degrees of grammatical productivity in word formation (a-e) follow the same order of criteria in terms of their 'severity of obstacles' that need to be overcome in the process of integration of loan words (Dressler, 2003).

a) During the process of morphological integration of loan words there is a constant application of word formation rules as an underlying mechanism. However, successful functioning of that mechanism may be rendered more difficult, if we have to integrate words that possess some 'unwelcome', i.e. unfitting properties. In other words, there are two difficulties for a WFR- foreignness and unfitting properties. Foreignness means that loan words are felt as strange and uncommon by the native speakers of a certain language and therefore very prone to the process of integration. Unfitting properties are defined by Dressler (2007) *"as a structural property which does not fit the structural description of the WFR or lack a structural property which is an obligatory part of its structural description"*. Such properties need to be changed before applying a rule, and one rule is expected to be maximally productive in order to overcome such difficulties and successfully accommodate them to the system of the target language. During the process of adaptation of foreign words, the most difficult case is when one loan word remains phonologically unintegrated. As pointed out by Dressler & Ladányi (2000a) *"phonologically unintegrated loan words can hardly undergo the application of a morphological rule"*. In Serbian it seems that there are no examples of phonologically non-integrated loan words and therefore there are only few undeclinable words at all (in contrast to Russian for example; cf. Dressler, 2005). This means that all 'unsuitable' foreign words undergo the process of phonological adaptation before applying of the WFRs. Very often, the adaptation of French words shows how these unfitting properties are first fitted before further morphological processes. For example the adjective *sporadique* is taken as a base for formation with indigenous adjective suffixes *-an* (adj. *sporadič-an*), *-ost* (n. *sporadičn-ost*), with the stressed *-o* that is typical for Serbian (the original accent of this word in French is on the final syllable) with productive alternations (morphological palatalisation [k]: [tʃ] before an *-a*). Similar loan words from the French stratum in the Serbian lexicon follow the same pattern, e.g. *praktič-an* 'practical', *romantič-an* 'romantic'.

b) In cases when one foreign word already shows appropriate, i.e. fitting properties, the rule application process has to 'beat' only the property of foreignness, as the unique problem. This may be illustrated with examples of denominal *-ski* suffixation, since this suffix applies to nouns irrespective of their gender. Therefore, all loan nouns may be used as bases for formation of descriptive or possessive adjectives in *-ski* (indigenous n. *škola* 'school'>adj. *škol-ski*). This is a very productive WFR, with numerous loan adjectives formed

in this way, e.g. *sport-ski*, *idiot-ski*, etc. However, as pointed out by Dressler (2005), this criterion is less certain for establishing full productivity, since the overall amount of obstacles is smaller and such words are more easily morphologically integrated into the target language.

c) This scale of productivity of WFRs continues with the application of rules on abbreviations of all kinds, although it is not very significant for the process of morphological integration, due to their so-called extragrammatical way of formation. Examples from Serbian are for example *ETF*, pronounced as 'e-te-ef' (*Elektro-tehnički Fakultet* 'Electro-technical Faculty'), which may form the following coinages: ADJ *eteef-ov*²⁹-*ski* 'from the ETF', N *eteef-ov-ac* 'student of the ETF', N *eteef-ov-ka* 'female student of the EFT'. For the female noun formation in such cases, when we have the WFR rivalry, these examples vouch for the productivity of the *-ka* motion suffixation, and not *-ica* or *-kinja*, since there are no attested coinages **eteef-ov-kinja* or **eteef-ov-ica*.

d) Another criterion for the productivity of WFRs is the case of rule shift. Normally, it happens when instead of one WFR another more productive one begins to be used, such as for example: Serbian diminutive suffixes (inflectional) *-e* is substituted by a more common or more natural suffix *-ić* for masculine: N MASC *stomak* 'stomach' > DIM N MASC *stomač-ić* instead of DIM N NEUT *stomač-e*. It means that the diminutive suffix *-ić* is more productive than the inflectional diminutive suffix *-e*, although this kind of diminutivization in *-e* can still be found in some Southern Serbian dialects.

e) The least certain criterion represents the coinage of neologisms, i.e. 'the novel application of WFRs to traditional indigenous words' (Dressler, 2007: 6). The most relevant among such cases are those where a neologism was created from a potential and not from an already accepted word (e.g. cf. Zemskaja, 1996: from Rus. *tret'ij mir* 'third world' > a potential verb *tret'emir-iz-at* > *tret'emir-iz-acija* 'process of transforming of the third world'). These new formations must be accepted and added to the mental lexicon of a given language.

This scale of productivity (Dressler, 2003; 2007) establishes the various degrees of productivity for the potential grammatical system of word formation- from the highest relevant criterion for the full productivity to the minimally certain one. This way of grading productivity is more complex and it is not only the matter of language use, as can be found in other proposed scales of WFRs productivity that regard the level of norms or performance (cf. Bauer, 2001).

²⁹ In such coinages, the interfix *-ov-* is obligatory.

6.2. The paradigmatic dimension of productivity in derivation

In contrast to the previously explained syntagmatic dimension of grammatical productivity, in the paradigmatic dimension it becomes clear that the relation between WFRs is much more complex, since base and derived words are interrelated with other potential or actual words from the lexicon. Moreover, different possible WFRs may also be competing for the same base form. Such an interrelation may be interpreted in Bauer's (2001) terms as 'paradigmatic forces' which may influence the formation of new words. However, it is not only the domain of WFR application of already existing words that matters, but also the domain of potential application of a WFR. Since this domain of the application of a rule may be broader, the overlap with other rules and its domains is very likely to happen (rule competition or rule rivalry). Thus, questions about the choice of certain WFRs and its application on the level of language as potential system belong to the paradigmatic dimension, which may be presented in form of the general scale of the probability of the application of WFRs. On the other hand, there are also analogical formations, which may be intuitively understood as influence of already existing words on new coinages. Both paradigmatic dimensions (WFRs application probability and analogical formations) will be described within this section as follows.

6.2.1. The scale of the probability of the application of WFRs

It is clear that the presence (or absence) of more or less productive WFRs influences their application probability, creating in that way various 'constellations of WFRs' (cf. Dressler, 2007), whose main types are presented in the following scale (1-5).

1) The first situation of WFR rule application is the case when only one fully productive rule exists. This means that there is no rule competition. In Serbian, an example for such a rule is the formation of ordinal numbers with the suffix *-i*, i.e. *pet-i* 'fifth', *sest-i* 'sixth', etc.

2) This case is found in situations when there is a productive WFR competing with an unproductive one. If in the actual system words formed by unproductive WFRs already exist, such rules may influence i.e. block the application of the productive ones. However, in dynamic morphology, productive WFRs may oust the unproductive ones and in that way lead to diachronic changes, rule shifts etc. An example for such a WFR application is reported by Dressler (2007) for deadjectival quality noun formation in German, where one of the

productive suffix allomorphs *-heit/-keit/-igkeit* is used instead of the unproductive *-e* suffix (e.g. *Schön-e* > *Schön-heit* 'beauty').

3) This case when there are two productive WFRs with unequal levels of productivity, i.e. a more productive rule competing with a less productive one. Rule competition may be very high in some word formation processes and two and more WFRs may overlap within potential and actual systems. The presence of more WFRs influences the probability of rule application (Laaha et al., 2006). In this specific case, the existence of two WFRs (one of whom is more productive) possibly applying to the same word base (input) is expected to limit the probability of rule application of the less productive rule. An example for such a case may be the competition between Serbian productive augmentative suffixation by the suffix *-čina* with the less productive *-etina*. This means that the variant *kamion-čina* 'lorry -AUG' is more probable than the possible *kamion-etina* 'lorry -AUG'. However, it is not always the case because there are examples where the higher token frequency determines the 'winner' between the two competing rules. It means that, if there are more similar actual words formed via one less productive rule, this rule will block the application of the more productive one. Thus, higher token frequency does not mean higher productivity!

4) The next point in this scale of the probability of the application of WFRs is the case when there are more equally productive WFRs competing, such as for example Serbian motion suffixes for female persons, *-ka* (*lekar-ka* 'female doctor'), *-ica* (*igrač-ica* 'female player') and *-kinja* (*student-kinja* 'female student'). The 'winning rule' for new coinages (with loan words, neologisms, etc.) must be chosen according to some criteria and factors that will be explained in the following section about analogical formations (6.2.2).

5) This is the case of the constellation of an unproductive rule, no matter if there are other competing WFRs (Dressler, 2007). Unproductive rules don't have the function of lexical enrichment, but may have the function of redundancy rules (Aronoff, 1976) or of morphosemantic or morphotactic motivation.

6.2.2. Analogical formation

As previously explained, the paradigmatic dimension contains another kind of coinage as well, namely analogy. More precisely, the analogical formation of neologisms shows rather specific behavior with regard to the coinage of new words. This process was a subject of study of many scholars (eg. Bauer, 1983; Plag, 1999). However, the status of analogy is not very clear among the word formation processes. Szymanek (2005) said that '*[g]enerally speaking, regardless of the strength and productivity of a particular pattern, a new complex word may be created by analogy*'. There are various uses of the notions 'analogy' and

'analogical', but the most relevant ones for the present investigation of WFRs and their productivity will be listed and explained as follows (1-6):

1) In the cases of unintentional coinages (in terms of Schultink, 1961), if analogy happens according to a 'well-defined pattern', such a pattern should be identified as a productive WFR.

2) In the cases when analogy refers to the coinage of new words that were triggered by an existing word (cf Plag, 1999 and his term *local analogy*), Dressler (2007) explains it metaphorically, saying that it is actually that specific WFR that represents 'the deep cause' for such a coinage, whereas that specific existing word is actually 'the triggering occasion', i.e a triggering pattern, phrase or word. Therefore, it is possible that new formations are not morphosemantically transparent (Plag, 1999), i.e. that there is a greater difference between the word formation meaning and the word meaning. For example, the Serbian feminine proper names *Branislav-a*, *Miroslav-a* served as a triggering model for the formation *popislav-a*, which was coined by some pre-school children for the general name of the priest's wife (*pop* 'priest'). Similarly, the word *princeza* served as a triggering pattern (*princ* 'prince' > *princ-eza* 'princess', LW Fr. masc. *prince*, fem. *princ-esse* 'princess') for the analogical formation of *klinc-eza* 'female kid' (< *klinac* 'kid').

3) In the cases of surface analogy to a non-rule-derived word, a WFR cannot be applied in such a coinage. An example could be German '*Millionen und aber-millionen*' in surface-morphology to existing '*hunderte und aber-hunderte*' formed by means of the cranberry morph *aber-*. In contrast to the unintentional coinages, this specific cases show the intentionality of users to create a more sophisticated formation according to some non-rule derived pattern.

4) Cases of analogical formations with unproductive rules as models are also considered to be intentional and due to the surface morphology, similarly with the previous case (3). An example for it can be the unproductive French verb class *-ir*, because there are recently coined new words (e.g. *alunir* 'to land on a moon') as a result of a surface analogy with the model verb *atterrir* 'to land' (from *terre* 'land').

5) Cases of surface analogies forming sets of new words which later, may be reanalyzed as rule-derived (Dressler, 2007). One of the much quoted example is the existing word '*haburg-er*' that was realnalysed as being formed by '*ham+burger*' which gave rise to analogical formations such as '*chicken-burger*', '*fish-burger*' etc. Or similarly, based on *automobile* as a model, the possible analogical formations are *electro-mobile* or *petro-mobile* (cf. Bauer, 2001).

The status of analogy has been a controversial question among the scholars. From the above mentioned cases it can be clearly concluded that almost all new 'analogical' coinages can be translated in one of the patterns (1-5), i.e. it is enough to have a prototype

and 'the pattern of (a prototype)' in order to productively coin other formations. Generally speaking, they are cases when a single existing word provides a pattern for other analogical formations, in contrast to more 'genuine' isolated and to some degree unpredictable analogies. Bauer (1983: 96) defined an analogical formation as '*a new formation clearly modeled on one already existing lexeme, and not giving rise to a productive series*'. However, there is still a possibility for sets of formations that he defines as follows:

'If instances of word-formation arise by analogy then there is in principle no regularity involved, and each new word is produced without reference to generalizations provided by sets of other words with similar bases or the same affixes: a single existing word can provide a pattern, but there is no generalization' (Bauer 1983, 294).

Plag (1999) claims that the traditional idea of productive word-formation rules must be distinguished from the 'local mechanism', i.e. from analogical formation. On the other hand, Plag (2002) admits that it is very difficult to draw the line between analogical patterns and WFRs. This assumption is in line with Szymanek (2005, 431) who says that '*it does not seem possible or appropriate to dissociate completely both concepts, i.e. analogy and (high) productivity*'. Therefore, Dressler (2007) proposes that those various 'schemes' should be split into different WFRs, taking into consideration their degrees of productivity. Results of the study conducted by Klegr & Čermak (2009) similarly show that analogical formations recall all the major word formation processes. Therefore, such analogical formations may be classified as belonging to some of the major word formation processes: the derivational type (e.g. *tactile* > *audile*, both examples belong to surface morphology), the compound type (e.g. *mouse potato* < *couch potato*), the conversion type (e.g. *ascent* < *ascend*, based on *descent* < *descend*) etc. Their view argues for the assumption that analogical coinage should be understood as a part of respective word-formation processes and not as an independent process. Only new coinages formed via extragrammatical means (e.g. echo-formations, phonaestemes, cf. Bauer, 2001) are not able to be fitted into any rule format of WFRs (Dressler, 2007).

6.3. Evaluative morphology in Serbian

Evaluative morphology (Scalise, 1984) prototypically comprises diminutives, augmentatives as well as pejoratives and endearment. In various languages, evaluative affixes may be applied to different parts of speech (nouns, verbs, adjectives). However, evaluative morphology does not have the same status and role in languages of the world. Moreover, there are languages that do not have evaluative affixes at all (cf. Körtvélyessy & Stekauer, 2011). Of all evaluative operations, diminutives have attracted greatest attention in the linguistic research (cf. Dressler & Merlini Barbaresi 1994; 2011) and they are much more widespread cross linguistically than augmentatives. In other words, augmentativization is said to be a marked operation, whereas diminutivization is unmarked (Dressler & Merlini Barbaresi, 1994).

Slavic languages display rich inventories of evaluative suffixes. In Serbian, there are all kinds of evaluative formations (diminutives, augmentatives, endearing forms and pejoratives). For the topic of the present Master Thesis, I will limit myself to Serbian diminutives and augmentatives in terms of productivity.

6.3.1. Structure of Serbian diminutives

In Serbian, the most productive rule for creating diminutives from nominal bases is: $N \rightarrow N + \text{DIM SUFF} + \text{ISUFF}$ (Manova, 2005). It is a derivational process involving the addition of numerous derivational suffixes expressing diminutive meaning, which is represented in table (5). It is almost always accompanied by the productive morphonological palatalization in the appropriate phonological contexts, i.e. palatalization [k]: [tʃ], [g]: [ʒ], [h]: [ʃ] between the stem and the corresponding diminutive suffix, especially if the suffix begins with an [e] or [i].

DIMINUTIVES	suffixes	examples	productivity
on masc. bases	-ak	<i>cvet</i> 'flower'> DIM MASC <i>cvet-ak</i> <i>oblak</i> 'cloud'> DIM MASC <i>oblač-ak</i> (+palatal.)	no
	-ić	<i>zub</i> 'tooth'> DIM MASC <i>zub-ić</i> <i>vuk</i> 'wolf'> DIM MASC <i>vuč-ić</i> (+palat.)	yes
	-čić	<i>prozor</i> 'window'> DIM MASC <i>prozor-čić</i>	yes
	-če	<i>pastir</i> 'shepherd'> DIM NEUT <i>pastir-če</i>	yes
	-ac	<i>brat</i> 'brother'> DIM MASC <i>brat-ac</i>	no
on fem. bases	-ica	<i>buba</i> 'bug'> DIM FEM <i>bub-ica</i> <i>ruka</i> 'hand'> DIM FEM <i>ruč-ica</i> (+palat.) or DIM FEM <i>ruk-ica</i> ³⁰ (-palat.)	yes
	-če	<i>svinja</i> 'pig'> DIM NEUT <i>svinj-če</i>	yes
	-urak	<i>devojka</i> 'girl'> DIM MASC <i>devojeć-urak</i>	no
on neut. bases	-ce	<i>drvo</i> 'wood'> DIM NEUT <i>drv-ce</i>	yes
	-ance/- ence	<i>dete</i> 'child'> DIM NEUT <i>det-ence</i>	no
	-ašće/- ešće	<i>jagnje</i> 'lamm'> DIM NEUT <i>jagnj-ešće</i>	no

Table 5: Diminutive suffixes in Serbian

Traditionally speaking, evaluative suffixes belong to the derivational morphology in Slavic languages. However, there is a special case in some Slavic languages, i.e. in Serbo-Croatian and in Bulgarian, with an unproductive way of diminutives formation, namely by an inflectional suffix –e (originally for vocative case) N→N+ ISUFF (cf. Manova, 2005). Manova (2005) calls such diminutives ‘inflectional’³¹. In Serbian this type seems to be even more restricted than in Bulgarian, i.e. it can be mainly applied only in order to obtain the semantic meaning of ‘young of animals/people’ e.g. FEM *ptić-a* 'bird'→DIM NEUT *ptić-e*, e.g. MASC

³⁰ Palatalization is not obligatory with feminine bases and the diminutive suffix –ica.

³¹ One of the possible explanations for this phenomenon may be connected to the Old Church Slavic et- stems (cf. Georgiev, 1995; Manova, 2005). According to this view, diminutives ending in –č-e, with –č- as a part of a stem due to the process of palatalization (FEM *devojk-a*→DIM FEM *devojeć-e*) lead by reanalysis to the appearance of the real diminutive suffix –če.

đak 'pupil'→DIM NEUT *đać-e*, with a palatalization involved. This is in line with the assumption that the emergence of diminutive value in Slavic, Romance and in Greek originates in the semantic scheme 'child/young of X' (Körtvélyessy & Stekauer, 2011). However, there are also some examples of other common nouns diminutivized in the same way, e.g. *sanduk* 'box'→DIM NEUT *sanduč-e*, *sokak* 'street'→DIM NEUT *sokač-e*. Such diminutives follow declension pattern of the neuter microclass III.2.a₃, with stem amplification -t- in oblique cases in singular. For the plural, these nouns may belong to the feminine microclass II.2, with the collective suffix -ad (*lisica* 'fox'→DIM FEM SG *lisič-e*, DIM NOM PL *lisič-ad*), or to the masculine class I.1a, with the nominative plural in -i (DIM NOM PL *lis-ić-i*).

6.3.2. Non-prototypical nature of diminutives

Diminutive formation is a non-prototypical morphological category and thus very difficult to classify (cf. Dressler & Merlini Barbaresi 1994). Having seen previous examples, it can be concluded that diminutivization is mainly expressed derivationally, although there are some instances of unproductive inflectional diminutives. Diminutivization has already been mentioned in section 5 of this Thesis, referring to their particular position on the derivation-inflection continuum. More precisely, diminutives are defined as non-prototypical derivation, since they show some characteristics typical for inflection (e.g. input and output words are belonging to the same word class). Therefore, it can be interesting to describe precisely their particular nature and why they are defined as non-prototypical derivation. In order to answer these questions, diminutives will be described in terms of criteria (1-5) used for distinguishing derivation from inflection (cf. Dressler, 1989). The same is valid for Serbian augmentatives as well.

1) Change of word class is the first criterion to come in mind when trying to distinguish between inflection and derivation. Derivation prototypically changes word-class whereas inflection does not. In Serbian, the formation of diminutives is word-class preserving³², as in other Slavic languages, for example in Bulgarian and in Russian (Manova, 2005). Examples of word-class changing diminutivization in Serbian are extremely rare (cf. Babić, 1991. e.g. ADJ *zelen* 'green'→ N *zelen-ić* 'little green tree') or some newly formed diminutive formations, e.g. ADJ FEM *slatka* 'sweet'→ N *slatk-ica*³³ 'sweet girl', 'sweety pie'. Because of that reason, formation of diminutives shows the property, i.e. word-class preserving, which is

³² In German for example, diminutivization is always word-class changing, e.g. ADJ *lieb* → N *Liebchen* 'the dear-DIM', cf. Dressler & Merlini Barbaresi 1994)

³³ This example can be found in the Dictionary of the Serbian Language (*Rečnik srpskohrvatskoga književnog jezika*, see reference), but also in the morphological dictionary of Serbian, available online: <http://www.lexicom.rs/Lexicon/Entry.aspx?id=62586&r=slatkica&lang=sr-Latn>

more common to inflection than to derivation. Moreover, during the diminutivization, change of gender occurs only rarely, as we can see in table 5.

2) The criterion of obligatoriness & syntactic relevance says that inflection is obligatory, whereas derivation is optional. 'Obligatory' in this context means that it is required by the criterion of syntactic relevance (Dressler, 1989). This explanation clarifies the Anderson's definition (1982) that "inflectional morphology is what is relevant to the syntax" (cf. section 5.1). However, the use of diminutives in Serbo-Croatian is not directly connected to the syntax, but it rather depends on speakers' choice. Put another way, it does not participate in syntactic agreement and we can conclude that according to this criterion, diminutivization is seen as a derivational process or as inherent inflection (cf. section 5.1; Booij, 1996).

3) Productivity is also one of the criteria used for distinguishing derivation from inflection. Generally, inflection is said to be more productive than derivation. However, when we speak about evaluative suffixes, it is clear that they show greater productivity than some inflectional processes, at least in highly inflecting language (cf. Manova, 2005). Evidence for such a statement could be the fact that it is possible to form diminutives from almost every noun, including foreign words as well. Therefore, according to this criterion, formation of diminutives is similar to inflectional processes rather than to derivational ones. However, diminutivization shows other relevant features, such as the possibility to form more than one diminutive from the same base: e.g. FEM *devojka* 'girl' > DIM MASC *devoјč-urak*, DIM NEUT *devoјč-e*. Moreover, there are also some cases of recursive or multiple evaluative suffixes: e.g. FEM *knjiga* 'book' > *knjiž-ič-ica* 'book- DIM-DIM-FEM' or even more uncommon FEM *noga* 'leg' > *nož-urd-ica* 'leg-AUG-DIM-FEM' or (< V. *smrdeti* 'to smell') *smrd-ulj-ica* 'smell-AUG-DIM-FEM'.

4) Order of morphemes is also one of the criteria, according to which inflection is more peripheral than derivation. A prototypical Slavic word will have the following morphotactic structure: PREF-ROOT-DSUFF-(TM)³⁴-ISUFF (Manova, 2005). In Serbian, diminutives obey this rule, because diminutive suffixes precede the inflectional ones, e.g. *devojka* 'girl' > *devoјč-ic-om* 'girl-DSUFF (DIM) – ISUFF (INSTR SG)'.

5) As proposed by Scalise (1984), derivational rules change the inflectional class of words, whereas inflectional rules do not. According to this criterion, formation of diminutives in Serbian is both a derivational and inflectional process. Consider the following examples N MASC *pastir* 'shepherd' (class I.1a₂) > N DIM NEUT *pastir-će* (class III.2a₃) or N DIM MASC *pastir-ić* (class I.1a₂). Manova (2005) suggests that the change of inflectional classes should be the unique evidence for distinguishing between derivational and inflectional status of one

³⁴ TM-thematic markers, occur only in verbal morphology as parts of stems.

category. This view is justified by the fact that inflectional class organization is the most important feature of inflection languages. Skalička (1979) pointed out that Inflecting languages have a typological characteristic of making a clear distinction between derivational and inflectional suffixes. These languages have rich inflectional morphology, which means that they have lots of inflectional categories and also numerous inflectional affixes for one category.

As pointed out by Manova (2005) Slavic diminutives (e.g. Bulgarian, Russian, and Serbo-Croatian) are more derivation-like than inflection-like because 'they use a set of suffixes hosted by the derivational slot of the word and the output of diminutivization cannot be identified inflectionally'. Thus, diminutives in Serbian will be considered as a case of non-prototypical derivation.

Again, if we look at the derivational-inflectional continuum, the slot named non-prototypical inflection will also be occupied by some (rare) cases of non-prototypical conversion in Serbian. It is exactly the case of so-called 'inflectional' diminutives, i.e. when a diminutive is formed by an inflectional suffix *-e*, and not by addition of derivational suffixes as expected. In both Bulgarian and Serbian, diminutives formed in this way will be of neuter gender, with the morphonological palatalization in the corresponding contexts:

MASC *sanduk* 'box' → DIM NEUT *sanduč-e*

FEM HYP³⁵ *maca* " → DIM NEUT *mač-e*

FEM *ptica* 'bird' → DIM NEUT *ptič-e*

MASC *sokak* 'lane' → DIM NEUT *sokač-e*

MASC *stomak* 'stomach' → DIM NEUT *stomač-e*

6.3.3. Augmentative noun suffixation

Criteria from the previous section about defining diminutives in terms of the non-prototypical derivational properties are true also for augmentatives in the Serbian language. Generally speaking, augmentatives occur less often than diminutives and there are less augmentative than diminutive suffixes, i.e. the type and token frequency of diminutives is higher (Dressler & Merlini Barbaresi, 1994). Moreover, it is cross-linguistically confirmed that in languages that possess both diminutives and augmentatives, there are more diminutive than augmentative suffixes. This represents some evidence for markedness of augmentatives in regard to diminutives.

³⁵ Hypocoristic from the noun *mačka* 'cat'.

Despite being thus treated as a marked category, this kind of evaluative morphology is much more widely used in Slavic than in Romance languages or in Greek (Körtvélyessy & Stekauer, 2011). Serbian augmentives are considered to have the primary denotative meaning of enlargement. However, this quantitative element comes rarely alone, since there are usually other emotional impressions and negative connotations (ugliness or depreciation) indicated by the same suffix. Because of that, in the majority of cases augmentatives are very similar to pejoratives. Serbian has several suffixes for augmentative formation, which may be attached to all kinds of nouns, irrespective of their gender (table 6). Among them, the most productive suffixes are *-ina*, *-čina* and *-etina* and in principle, these suffixes may be added to every indigenous or foreign noun, as shown in evaluation tests conducted with 20 native speakers (section 6.3.4.). Greater length of augmentatives than of diminutive suffixes represents iconicity in two ways: 1) bigness vs. smallness and 2) markedness vs. unmarkedness.

AUGMENTATIVES	examples	productivity
<i>-ina</i>	MASC <i>vojniki</i> 'soldier' > AUG FEM <i>vojnič-ina</i> (+palat.) NEUT <i>meso</i> 'meat' > AUG FEM <i>mes-ina</i>	yes
<i>-čina</i>	MASC <i>lažov</i> 'liar' > AUG FEM <i>lažov-čina</i> FEM <i>budala</i> 'fool' > AUG FEM <i>budal-čina</i>	yes
<i>-urda</i>	FEM <i>glava</i> 'head' > AUG FEM <i>glav-urda</i>	no
<i>-etina</i>	FEM <i>glava</i> 'head' > AUG FEM <i>glav-etina</i> FEM <i>ruka</i> 'hand' > AUG FEM <i>ruč-etina</i> (+palat.)	yes
<i>-urina</i>	FEM <i>noga</i> 'leg' > AUG FEM <i>nož-urina</i> (+palat.)	no
<i>-uština</i>	FEM <i>magla</i> 'fog' > AUG FEM <i>magl- uština</i>	no
<i>-uljina</i>	FEM <i>trava</i> 'grass' > AUG FEM <i>trav- uljiina</i>	no

Table 6: Augmentative suffixes in Serbian

In contrast to diminutive suffixes, augmentative suffixes are added to noun bases of all three genders. However, the least common are augmentatives from neuter bases, and even if possible, these formations sound pretty strange for native speakers (e.g. NEUT *selo* 'village' > FEM AUG *sel-etina*). Interestingly, all outputs are feminine, since all augmentative suffixes are feminine. More negative connotations and therefore the higher degree of pejorative meaning have the following suffixes *-uljina*, *-uština*, *-urina* and *-urda*.

6.3.4. Productivity of Serbian evaluative suffixes

Formation of diminutives is very productive, with a rich set of suffixes that enter into different inflectional classes. Augmentative (and pejorative) suffixes are also productive, and all outputs of such augmentative formation belong to the most productive feminine inflectional class (II.1).

In order to get another piece of evidence for productive diminutive and augmentative patterns in Serbian, a written morphological evaluation test (see appendix) has been conducted with 20 native speakers of standard Serbian (from Belgrade). The evaluation was aimed at testing which are the most common ways for diminutive and augmentative formations in the 'Serbian way'. There were totally 33 items, 11 recent loan words (LW) and 22 indigenous words or older loans (IW) whose evaluative forms are not very common, e.g.

LW *ajpod* 'ipod' _____

IW *grlo* 'throat' _____

In this test, there were items of all three genders and participants were asked to fill in the gaps with all possible forms of diminutives and augmentatives (input+dim.suff. / aug. suff.). However, it was mentioned that the first form to be written should represent the most familiar and the most unmarked choice.

All the results confirmed the traditionally established classification of evaluative suffixes, but they also provided us with some interesting information about the status of the so-called inflectional suffixes in -e (section 6.3.1).

Regarding diminutives, recent masculine loan words in consonants are always formed via *-ić* or *-čić* (e.g. *kompjuter-čić* 'computer-DIM', *ajpod-(č)ić* 'ipod-DIM') whereas feminine LWs in -a take always the suffix *-ica* (e.g. DIM FEM *sof-ica*). These are exactly the two most productive diminutive suffixes. As we have seen in section 4.1.3., there are no loan words ending in -o that are accommodated into some of the neuter microclasses and therefore the findings from such a test could not give information about the most productive diminutive suffixes for neuter bases. Therefore, LWs in -o choose some of the suffixes for masculine bases, as attested in this test (e.g. MASC DIM *kimon-ić*, MASC DIM *aut-ić*). The LW *radio* ('a piece of electronic equipment') in majority of answers resulted to be an impossible base for a diminutive formation. Only one native speaker coined the diminutive by the suffix *-ak* > *radij-ak*, which is in principle possible but rather strange form.

The results from the part of the test with older loan or indigenous words points out the highest productivity of diminutivization suffixation in *-a* for feminine bases (e.g. *slanina* > *slanin-ica* 'bacon-DIM'). Suffixation in *-ić* or *-čić* for masculine bases confirmed its highly productive status among other diminutive suffixes, followed by *-če* suffixation which showed a certain level of productivity as well (e.g. MASC *momak* > MASC *mom-čić*, MASC *mom-če*

'boy-DIM'). Interestingly, there were some answers that involved the inflectional way of -e suffixation (e.g. *prsluk* > *prsluč-e* 'waiscoat', with the palatalization involved). However, this kind of formation is reserved only for certain words and it is not used for the diminutive formation of recent loan words, which makes this diminutive suffix unproductive. In southern Serbian substandard dialects, diminutives in -e are much more productive, due to the influence from the Bulgarian language, where this kind of diminutivization is more common than in the standard Serbian (Manova, 2005). Regarding neuter bases, the productive diminutive suffixes occurred in answers from this test are -*ašće* (NEUT *brdo* > NEUT *brd-ašće* 'hill-DIM') and -*ence* (NEUT *staklo* 'glass, mirror' > NEUT *stakl-ence*).

The answers of the possible augmentative forms of given recent loan words in the test undoubtedly showed which the most productive suffixes is, namely -*čina* (e.g. MASC *ajpod* > FEM AUG *ajpod-čina* 'lpod', MASC *kompjuter* 'computer' > FEM AUG *kompjuter-čina*, MASC *aparat* 'mashine' > FEM AUG *aparat-čina*). This suffix has actually always been the first choice for being attached onto a loan word ending in a consonant in order to obtain the augmentative meaning, irrespective of the gender of the base noun. However, with LWs ending in a vowel, apart from -*čina*, there are other possible options (MASC. *auto* > FEM AUG *aut-ina*). Regarding feminine bases of LWs finishing in -a, it was found that the suffix -*etina* (e.g. FEM *sofa* > FEM AUG *sof-etina*; FEM *firma* 'company' > FEM AUG *firm-etina*) to be slightly preferred to - *čina*.

Regarding the augmentative formation of indigenous words, almost the same observations were made based on the results from the conducted test. For example, lots of neuter base forms in -o chose the augmentatives suffix -*ina* (e.g. NEUT *brdo* 'hill' > FEM AUG *brd-ina*; NEUT *staklo* 'glass, mirror' > FEM AUG *stalk-ina*; NEUT *grlo* > FEM AUG *grl-ina* 'throat- AUG'). Masculines in a consonant showed the preference for the suffix -*čina* (e.g. MASC *bokal* 'pitcher' > FEM AUG *bokal-čina*), whereas feminines for the -*etina* (e.g. FEM *tepsija* 'pan' > FEM AUG *tepsij-etina*).

6.4. *Nomina agentis* and feminine motion and their productivity

In previous sections, I have illustrated one of the Serbian most productive derivational process-formation of diminutives and augmentatives. Since the word-class is maintained, it is defined as a nonprototypical derivational process. In this section, it will be demonstrated one of the Serbian most productive prototypical derivational processes- formation of nouns from verb bases (i.e. deverbal nouns). It is a large group of nouns with lots of meanings, such as names of activities, processes, events, instrument nouns or agent nouns. In the Serbian

language, agent nouns (*nomina agentis*) are one of the most frequent and productive derivational categories. There are several suffixes used in coining of *nomina agentis* from verbal bases (see table 7).

Nomina Agentis (deverbal)-masculine	examples	productivity
-ac	<i>pis-ac</i> 'writer' < <i>pisati</i> 'write'	yes
-telj	<i>uči-telj</i> 'teacher' < <i>učiti</i> 'teach'	yes
-lac	<i>misli-lac</i> 'think-er' < <i>misлити</i> 'think'	yes
-ar	<i>čuv-ar</i> 'keeper' < <i>čuvati</i> 'keep'	yes
-ač	<i>pev-ač</i> 'singer' < <i>pevati</i> 'sing'	yes

Table 7: Nomina agentis- masculine nouns

This derivational pattern (V>N) is very productive in Serbian, forming in that way a wide range of nouns (*lov-ac* 'hunter', *goni-lac* 'follower', *voz-ač* 'driver', *snima-telj* 'cameraman', *pek-ar* 'baker', etc.). All nouns formed by means of these suffixes denote masculine persons performing the activity expressed with the input verb.

Regarding suffixes forming feminine agent nouns, there are several indigenous suffixes, as illustrated in table 8. Exept for the productive suffix –*ara*, which may sometimes refer also to masculine persons, all remaining suffixes are rather unproductive and are hardly used for coinage of feminine agent nouns.

Nomina Agentis (deverbal)-female	examples	productivity
-lja	<i>pra-lja</i> 'washer-(female)' < <i>prati</i> 'to wash'	no
-ulja	<i>pobeg-ulja</i> 'escapee (female)' < <i>pobeći</i> 'to escape'	no
-ara	<i>trač-ara</i> 'gossip (female)' < <i>tračariti</i> 'to gossip'	yes
-ača	<i>udav-ača</i> 'bachelorette' < <i>udavati se</i> 'to marry'	no
-uša	<i>brblj-uša</i> 'chatterbox' (female)' < <i>brbljati</i> 'chat'	no

Table 8: Nomina agentis-feminine nouns

Another very productive way for feminine agent noun formation in Serbian is by means of grammatical motion suffixes (e.g. *-ica*, *-ka*), i.e. they change only the gender of the

already derived masculine names for persons, titles or similar. For instance, *učiti* 'teach' > *uči-telj* 'teacher- MASC' > *uči-telj-ica* 'teacher- FEM' or *moliti* 'pray' > *moli-telj* 'prayer-MASC' > *moli-telj-ka* 'prayer-FEM'. These two suffixes show the highest productivity, but there are also other less productive suffixes (e.g. *-inja* or *-kinja*). Since in the Serbian language there is no unique standard form regarding feminine nouns (in German, for example, there is a suffix *-in* for such feminine variants), more answers are possible. In other words, in cases of recently loaned agent nouns there may be found more formations that are considered by native speakers to be in the spirit of Serbian (e.g. *asistent* 'assistant' > *asistent-ica*, *asistent-kinja*; *dekan* 'dean' > *dekan-ka* 'dean-FEM'; *profesor* > *profesor-ica*, *profesor-ka* 'professor-FEM'; *doktor* > *doktor-ica*, *doktor-ka* 'doctor-FEM'). However, certain forms turn to be more frequent, especially with neologisms of the foreign origin, e.g. *menadžer* > *menadžer-ka* 'manager-FEM'; *režiser* > *režiser-ka* 'director-FEM'; *ombudsman* > *ombudsman-ka* (FEM); *kancelar* > *kancelar-ka* 'chancellor-FEM' (cf. Savić, 2009). Native speakers define some of these new coinages as being very strange (although possible) forms, whereas older formations or recent LWs with higher token frequency have already the preferred actual forms (e.g. *ministar* > *ministar-ka* 'minister-FEM'; *šef* > *šef-ica* 'boss, head-FEM'; *prijatelj* > *prijatelj-ica* 'friend-FEM'). However, there are no structural hints on why certain suffixes are preferred to others. Some scholars (cf. Težak & Babić, 1992) suggest that slight preference should be given to the feminine suffix *-ica*, especially if the input masculine form finishes in *-telj* (e.g. *brani-telj* 'defender' > *branitelj-ica*, *hrani-telj* 'defender' > *hranitelj-ica* and not: *branitelj-ka*, *hranitelj-ka*). Other scholars (cf. Stojanović & Popović, 2011) claim both suffixes *-ica* and *-ka* to be equally productive and in most cases interchangeably usable. Bearing in mind huge variety of Serbo-Croatian dialects, it may be concluded that *-ica* is more common for Croatian, whereas *-ka* for the Serbian variant.

Regarding table 8 where indigenous deverbal suffixation for feminine agent nouns is given, it is worth noting that most of these suffixes are used in a pejorative way. It is also confirmed by the fact that feminine variants from loan masculine words formed by means of these suffixes have a pejorative meaning (e.g. MASC *sponzor* 'sponsor' > FEM PEJ *sponzor-uša* with the meaning of a 'gold digger').

There are also suffixes that may denote both masculine and feminine agent nouns contemporary, such as for example *-ija* (*krvopija* 'shrew (woman)'), *-lo* (*piskaralo* 'writer', *tumaralo* 'wanderer'), *-lica* (*propalica* 'a failed person'), *-ica* (*zvanica* 'guest', *izjelica* 'a big eater', *pridošlica* 'new comer', *varalica* 'cheater') and *-ara* (e.g. *tračara* 'a gossip person', *šljok-ara* 'a drunk').

6.5. Conclusion

To sum up, the analyses of these two Serbian derivational processes, i.e. prototypical (agent nouns) and non-prototypical (evaluative formation) have shown that Serbian lacks one-to-one correspondance between the form and the meaning, because there are more than one suffix that create diminutives, augmentatives or agent nouns, as explained previously. Moreover, most of the analysed suffixes have more than one meaning (e.g. *-lo* for *nomina agentis*, *nomina instrumenti*, *-ica* for *nomina agenti*, diminutive formation, etc). Since there is no strict systematicity in the distribution between the different WRFs and suffixes, the productivity plays a great role in their usage. These examples of the Serbian derivational processes confirm the typological assumption that highly inflecting languages are mostly unnatural on the biuniqueness parameter of the first subtheory within the Model of Natural Morphology. More on typological properties will be said in section 8 of this Thesis.

7. Evidence for productivity from First Language Acquisition

Acquisition studies have a prominent role in linguistics, since they provide external evidence for linguistic theories. The model of Natural Morphology uses internal sources (e.g. language change, language typology, chronology of change etc.) and external sources (e.g. evolution, linguistic errors, perception tests, etc.) in order to validate its theories about naturalness (cf. Dressler et al., 1987). Thus, facts provided by processing, acquisition and language impairments are of great importance for evaluating the concepts of 'productive', 'natural' and 'unmarked'. Usually, the earliest forms in the children's production are the most productive and the most natural ones.

Research on first language acquisition is aimed at early children's production in order to investigate the first forms to appear, the order in which they emerge and the errors committed by children. There are two complementary methods of data collection, naturalistic and experimental. Naturalistic approach consists of data collection conducted by investigators that observe and record children's spontaneous speech in many ways, usually in the so-called diary study or in a more systematic way (regular recording sessions). Transcripts of such data are later used for detailed linguistic analysis. Most of transcripts including thousands of hours of data from more than twenty languages are nowadays available online, though the Child Language Data Exchange (CHILDES). These naturalistic data collections are usually longitudinal, i.e. they take a long time to conduct and therefore they examine language development over an extended period of time providing the information about the development of language production (cf. O'Grady & Cho, 2008). On the other hand, experimental studies are generally conducted by researchers who make use of specially designed tasks to elicit linguistic activity that is relevant to the phenomenon under consideration.

This section of the Thesis examines the early development of Serbian inflection and derivation in order to investigate the first forms in children's production in terms of productivity. In other words, the aim here is threefold, (a) to briefly show which the first morphological forms in children's production are; (b) to investigate if these forms are also the most productive one and (c) to study the development of forms and if the errors committed by children (e.g. class shift) follow the preestablished direction, i.e from the less to the more productive one.

I will mainly follow the theoretical model of the “Crosslinguistic Project on Pre- and Protomorphology in Language Acquisition”³⁶ (Dressler et al. 1997b) and the developmental approach obtained from it. According to this view, children gradually construct grammatical modules and systems, which means that grammatical modules are not innate. Later, when the primitive grammatical system becomes more complex, acquired modules need to be reorganized into submodules. As claimed by Dressler and Karpf (1995), children select and organize patterns following the preferences of Natural Morphology. Thus, there is a crucial role of children’s input, linguistic experience and communicative function. Early morphological development is divided into three phases (cf. Dressler, 2005):

1) Premorphology is the initial phase in which rote-learned forms appear. There is no differentiation between grammatical forms and children’s production is limited to certain number of inflectional forms that are lexically stored. There are many extragrammatical formations (e.g. reduplicative onomatopoeics, cf. Dressler, 2005b).

2) Protomorphology is the phase in which first productive morphological patterns emerge (cf. Gagarina, 2009). Children start to create first analogical formations, to generalize over rote-learned forms and to detect principles of decomposition (Dressler, 2005b). In the protomorphological phase, inflectional forms and processes start to be productive. Such a productive use of forms in children’s production shows that these productive patterns are not repeated as rote-learned forms, but they may be rather decomposed into parts. This attitude is confirmed by overgeneralization examples. Moreover, in this phase children use more inflected forms of the same lemma.

3) Morphology proper is a phase in which children start to use adult-like morphology.

Being exposed to the input, children choose morphological patterns depending on universal markedness preferences and other relevant factors. Extensive cross-linguistic research in first language acquisition has confirmed that in language development of children several factors interact, i.e. among other preferences of universal markedness and naturalness, frequency, transparency, productivity, typological characteristics of a given language, etc.

An overview of the investigation on early development and productivity of some inflectional and derivational patterns in first language acquisition of Croatian or Serbian language will be given in the following sections. I will primarily use the corpus of one Croatian-speaking girl Antonija (ANT), available online (CHILDES database; Kovačević, 2003) and that has already been used for investigations by some Croatian linguists (Katičić,

³⁶ This project researches more than a dozen languages in order to study the acquisition of morphology up to the age of three years. It collects, transcribes, codes (in CHILDES format) and analyses longitudinal corpora in order to arrive at universal, typological and language-specific generalizations according to the theoretical framework of Natural Morphology.

2003; Palmović, 2007; Kovačević, 2009). This corpus consists of audio-recordings of the girl from the age of 1;3.3 until the age of 2; 8.16.

7.1. Early productivity in noun inflection

As already explained, Serbian and Croatian belong to highly inflected languages, with very rich and complex morphology. I will briefly demonstrate in this section how the early development of the Serbian noun inflection proceeds. The purpose of such an investigation is to show if the earliest emerged forms in the children's production confirm the previously determined microclasses in terms of productivity.

Regarding the gender, the majority of nouns used by Antonija are feminine. Kovačević and colleagues (2009) explain this fact saying that it may be because of the commonest topic of a child's conversation in the early stage, which is usually about dolls (*lutka* 'doll'). All of these nouns belong to the Serbian most productive feminine microclass (II.1), which is, at the same time, the most transparent one (e.g. no palatalization in Nom. Pl.). It was also observed that neuter nouns have the smallest number of tokens in the whole corpus, which confirms the fact that neuter gender is not productive in this south Slavic language.

The development of the declension system is explained through the number of the noun types of the same lemma, because these forms are used in different cases. Generally speaking, the emergence of first mini-paradigms and oppositions in the children's production is a very important event in the acquisition of noun inflection in a given language. As found out in the corpus, first oppositions (Nom. Sg. *lopt-a* 'ball' vs. Acc.Sg. *lopt-u*) and the very first grammatical markers appear very early in one-word phase, at the age of 1;6. This vouches for an early emergence of morphological marking. At the end of the recorded period (2;8), the girl already uses five-member paradigms. Again, feminine productive class in *-a* seems to be slightly more transparent for a child than the most productive masculine class ending in a consonant due to the absence of morphological palatalization in Nom. Pl. of feminines in *-a*. Moreover, Nom. Sg. and Acc. Sg. emerge first in the early stage of language acquisition and masculine inanimate nouns have the same form of these two cases, which makes it is very difficult for a child to distinguish case endings. Kovačević et al. (2009) claim that the reason for such an early emergence of oppositions should be found in the typological characteristic of Croatian, i.e. in its morphological richness.

First case-marked nouns in Antonija's production appear early, at the age of 1;4 (Acc.), 1;5 (Gen.), 1;9 (Dat., Loc.), 1;10 (Instr.). A quick insight into other available corpora of

the Serbian- and Croatian-speaking children from the CHILDES database has confirmed this order of the case emergence in child speech. However, as pointed out by Kovačević and her colleagues (2009), this is only a preferred order of the case acquisition, which does not mean that all nouns will follow this order. In the protomorphological phase, the number of transitive verbs increases, which leads to significantly increased percentage of forms in the accusative case (ANT at the age of 2;5, cf. Kovačević et al., 2009). In Antonija's corpus, the most frequently used cases are Nominative, Genitive, Accusative and Vocative.

Regarding inflectional errors, in this corpus there are only few of them found (only 20 errors out of 1780 token nouns). Due to great morphological complexity of Croatian, children are familiar with the high number of morphological markers from the very beginning and they tend to use them always, even incorrectly. One of the commonest mistakes observed in this corpus implies the correct use of the preposition followed with the incorrect case marker. For example, instead of the correct prepositional phrase *u park-u* (u + Loc. noun, masculine class I.1b) "in the park", the child produced *u park-i* (u+ Loc.noun, feminine class II.1a₂). Such an error may be explained by the fact that the majority of the nouns in the early stage are feminine and that the child is more familiar with the most productive feminine pattern. This entire feminine microclass (II.1a) seems to be the most transparent and the least marked in the whole Serbo-Croatian inflectional system. Therefore, children simplify in a way such a complex morphological system by means of the easiest and thus the most natural pattern to learn and produce. However, since there are few inflectional errors in the studied corpus totally, a strong generalization is difficult to be formalized and further investigation with this regard should be made.

To sum up, the analysis of Antonija's data show that the emergence of cases follows the certain order, with nouns in nominative, vocative and accusative as first oppositions. The very early emergence of oppositions (Nom.Sg. vs. Acc.Sg.) of nouns belonging to the most productive feminine declension pattern is to be considered as a proof for the productivity of these case forms. On the other hand, based on the results from this corpus, it seems that the latest case to appear (Instr.) is considered to be the least productive one. Few errors from the corpus may be taken as a sign for high productivity of feminine microclass in *-a* (II.1a), since the errors occurred showed the preference for this very transparent feminine microclass.

The study on the acquisition of case, number and gender in Croatian (Kovačević et al., 2009) compared Antonija's corpus with other two Croatian-speaking children. They found out that the great morphological reachness and complexity of Croatian nominal inflectional system has a very positive impact on the early language acquisition rather than being considered as an obstacle. This morphological development differs from the development in morphologically less complex languages, since the child learning a complex morphological

system starts to acquire these morphological patterns very fast and from the early stages (Kovačević et al., 2009).

7.2. Early productivity in verb inflection

The short investigation of the early verb development in Serbian and Croatian is also based on the data from a longitudinal study of one Croatian-speaking child (Antonija) and precisely on recordings from the age of 1;6.15 until the age of 2;0. The analysis of these data is aimed at investigating the early verb language development in Croatian and the same is also true for Serbian.

Omission of markers is the most frequent type of substitutions in Antonija's early first language acquisition, where verbs appear in their base forms, which is the 3P.Sg. Present tense. This is very typical for the premorphological period, as explained in Dressler & Karpf (1995). This form is considered to be the default form, i.e. the least marked and the simplest one, corresponding to the form of infinitive without the respective infinitival ending. In early child's production, these forms are used without the agreement in person with the subject (if expressed) (e.g. *ja prima-* 'I *receives', 3P.Sg.Pres, instead of the correct *ja primam-* 'I receive'). This 3P.Sg.Pres form is used also instead of imperatives in this phase (e.g. *čita!*, instead of the correct imperative form *čitaj* 'read!').

Antonija entered the protomorphology phase (cf. Dressler & Karpf, 1995) at the age of 1;9, when first analogical errors and class shift appeared. For example, she uses **hočem* instead of *hoću* and 3P.Pl.Pres, **ljub-i-ju* instead of the correct form *ljub-e*. As Katičić (2003) claims, such errors should be referred to as being analogical errors, because this 'shift' does not imply the fact that the child has already established all inflectional classes in her morphological system. In other words, the verb *hteti* 'to wish' belongs to a stagnant/recessive root-inflected class (Dressler et al., 1996) and has the 1P.Sg.Pres ending in *-u*, *hoću* 'I wish', together with another verb *moći* (1P.Sg.Pres *mog-u* 'I can'). However, Antonija starts marking the present of these verbs in analogy to other verbs with the productive suffix *-m* in the first person singular. Similarly, with the first emerged 3P.Pl. present forms from the productive class III.1, the incorrectly used marker is the most frequent one, namely *-ju* (as already explained in section 4.2., there are two other suffixes for 3P.Pl. present: *-u/-e*). Verbs from this class require changing of the thematic vowel *-i* and addition of the suffix *-e* in 3P.Pl. present. Since this girl treats them like verbs belonging to the more productive microclasses (e.g. PM IV, 3P.Pl.Pres. *gled-a-ju* 'they look'), it results in erroneous forms, e.g. **ljubi-ju* instead of the target form *ljub-e*.

Moreover, in this corpus there are also some examples of the class shift, exemplified by the verb *pisati* 'to write'. In Antonija's production, 3P.Sg. Pres. of this verb has the wrong form **pis-a* instead of *piš-e*. More precisely speaking, the class shift goes from the unproductive II.2.a microclass to a highly productive IV microclass, in which 3P.Sg. Pres. corresponds to the infinitive stem. It means that the changing of the thematic vowel is unnatural and more marked process.

To conclude, taking into consideration all the observations from this study (Katičić, 2003), the least marked verbal form is 3P.Sg. Pres., since it represents the earliest form to appear. Furthermore, the two most productive and transparent classes (IV and III.1) represent the two most frequent microclasses in ANT's verb production, which is also confirmed by analogical errors and class shifts. These results reinforce the conclusion made in the section dealing with the productive verbal microclasses in the Serbian language.

7.3. Early productivity in derivation-diminutives

Evaluative morphology in Serbian, especially diminutives, is a very productive derivational process which can be applied to almost all concrete and some abstract nouns, some adjectives, adverbs and verbs. Among all evaluative pattern diminutives are more frequently used in the Serbian language and therefore the main focus in this section will be laid only on the emergence of diminutives in the process of language acquisition. As already explained previously, there are several possible suffixes for diminutive formation, but the most productive are *-ica* for feminine, *-(č)ić* for masculine and *-(an)ce/-(en)ce* for neuter input nouns.

Diminutives are one of the first derivational patterns acquired by children from the very beginning of language acquisition. Diminutives have the primary denotative meaning of smallness, and, from a pragmatic point of view, may connote endearment, tenderness and affection. In languages with productive diminutivization, diminutives tend to be very frequently used in the language with and toward children (i.e. in child-directed speech, CDS) from the early stages of language acquisition, so that the child-oriented setting is obtained. Therefore, the role of diminutivization in the CDS has frequently been the subject of the language acquisition research (cf. Kempe et al., 2009). Apart from having strong affective connotation, the results from numerous studies on the acquisition of diminutives have shown that diminutives are often present at the early stage of language development because they are beneficial for certain aspects of language acquisition facilitating the acquisition of gender, case marking or noun-adjective agreement (Palmović, 2007; Kempe et al., 2009).

For an investigation of the diminutive production in language acquisition, I will use data from the same corpus of the Croatian-speaking girl Antonija. In her recorded production (1;3.3 until the age of 2;8.16) the majority of emerged noun diminutives are used for animals, body parts, toys, family members or food. First diminutive emerged at the age of 1;5 (*mama* ‘mummy’). From the age of 1;9 the number of diminutives produced by her increases in both types and tokens. Even though in CDS different suffixes (both productive and unproductive) were used to form diminutive nouns, in Antonija’s production only the most productive patterns were observed (majority in *-ica* and *-ić*). The more regular occurrence of diminutives is notable only at the age of 2;0, when the girl entered the protomorphological phase (Katičić, 2003). In this phase, there are also few examples of the oppositions between diminutive and the corresponding simplex form (at the age of 2;2). A detailed study on the acquisition of diminutives on the Antonija’s corpus was conducted by Palmović (2007) who noticed that most of diminutive nouns are feminine (55%), followed by masculine (37%) and neuter (8%). The majority of them are formed with the two most productive suffixes for diminutivization, namely *-ica* for feminine and *-ić* for masculine, whereas the productive neuter suffix *-ce* was not recorded at all in Antonija’s production. Instead, only few dialectal neuter forms emerged but they are not relevant for the purpose of the present study.

Errors in her speech involve problems with the oblique cases of feminine diminutive nouns that have only plural, i.e. pluralia tantum. She uses them as if they were singular, with the false Acc. Sg. form (**gać-ic-u* ‘panties’ instead of Acc. Pl. *gać-ic-e*). However, generally small number of errors in the diminutive formation occurred in the Antonija’s data.

To sum up, diminutivization is the very first derivational process used by Antonija, which confirms the cross-linguistic findings in numerous languages. The majority of diminutive examples in these recordings are built with the two most productive suffixes: feminine *-ica* (e.g. *cipel-ica* ‘shoe-DIM’, *knjig-ica* ‘book-DIM’, *ruk-ica* ‘hand-DIM’, *bomb-ica* ‘bomb-DIM’, *crkv-ica* ‘church-DIM’, *flaš-ica* ‘bottle-DIM’, *vreć-ica* ‘bag-DIM’, *lopt-ica* ‘ball-DIM’) and masculine *-ić* (e.g. *konj-ić* ‘horse-DIM’, *ps-ić* ‘dog-DIM’, *med-ić* ‘bear-DIM’, *mač-ić* ‘kitty’, *pjetl-ić* ‘rooster-DIM’), which belong to the two most productive inflectional classes, II.1 and I.1a, respectively. However, it should be mentioned that the first diminutives in the Antonija’s production were not connected to the meaning of smallness, but rather to the pragmatic values of closeness, endearment and love (cf. Palmović, 2007). Although diminutives appeared in Antonija’s production in the premorphological phase, they were productively used only from the protomorphological phase (2;0). The emergence and frequent use of diminutives in child-speech limits the number of declension patterns to the most productive ones only.

Due to their semantic (i.e. smallness) and pragmatic functions (i.e. endearment, empathy, pleasure, etc.), diminutives are very opportune for the child-directed speech. Some

findings in recent studies investigating the acquisition of evaluative morphology show that augmentatives (together with pejoratives) emerge only after diminutives and their use frequency increases in the so-called proper morphology phase (Savickiene & Dressler, 2007). Thus, I have no data from the investigated Croatian corpus that may be employed for the present investigation of the acquisition of augmentatives. These facts confirm that, among evaluative suffixes, only diminutives have the unmarked status.

7.4. Early productivity in derivation-agent nouns and feminine motion

Among prototypical derivational processes, one of the very productive patterns involves derivation of agent nouns from verbs. Another very productive process in Serbian, closely related to deverbal agent nouns, is formation of feminine nouns from masculine agent nouns with the so-called motion suffixes (cf. section 6.4 of this Thesis). This category has been the subject of the child language research, where it has been found that agent and instrument nouns in English and Polish are one of the earliest prototypical derivational processes present in the children's spontaneous speech from the age of 2 and in experimental elicitation task from the age of 3 (cf. Haman et al., 2009).

Serbian has several productive suffixes for coining agent nouns. However, available Serbian and Croatian corpora from the CHILDES database involve children in their earlier stages of language acquisition and are, hence, not applicable for providing useful information about the early development and productivity of agent nouns, since there are almost no recorded examples of agent nouns. In short, a corpus-based analysis of the emergence and early productivity of *nomina agentis* in first language acquisition of Serbian is not possible in the same way as in the previous three chapters that deal with the early productivity in inflection (noun and verb) and non-prototypical derivation (diminutives). Since I haven't found any examples of agent nouns in the previously used corpus of the Croatian-speaking girl Antonija, I have no data for their description, emergence and development in the early stage of language acquisition.

However, I came across an interesting example involving the preschool children in one Serbian kindergarten and that can be used for the purpose of this chapter. A group of preschool children take part in a TV Centar-Project called '*Besne Gliste*'³⁷ and it may be described as a kind of an experimental elicitation task (with audio- and video recordings). Participating children are asked various questions (e.g. *What does mean?*, *What is the name of...? How would you call...?*) in order to obtain spontaneous answers on different

³⁷ All TV episodes from this project are also available on-line (<http://www.youtube.com/watch?v=mILBAUEbU-4&feature=endscreen&NR=1>)

topics (everyday's life, customs, grammar competence, etc.). The example interesting to the purpose of this study was aimed at spontaneous coining of the female person noun with a motion suffix from the input simplex noun *pop* 'priest', since the question that children had to answer was: '*How do we call the priest's woman?*'. The correct answer is *pop-adija*, which is formed via an indigenous unproductive and not frequently used suffix *-adija*. Therefore, it was predicted that children do not know the right answer, which was expected to show derivational creativity of the Serbian preschool children. All of the coinages produced by children are possible but not actual Serbian words. Most frequently obtained answer was *pop-ica*, which involves one of the most productive suffixes for feminine noun derivation from a masculine base (*-ica*). Another interesting answer was *pop-kinja*. Although *-kinja* is a not very productively used suffix, it is very common for the school context, because nouns referring to children and the classes they attend are formed via this suffix (e.g. *prvak* 'boy attending first class' > *prvak-kinja* 'girl attending first class'). Among other answers, one very unusual (but still very productive) form was noticed (*Popi-slava*), which can be explained in terms of the analogy. In other words, masculine proper names finishing in *-slav* are very common and frequent in the Serbian language (*Brani-slav*, *Stani-slav*) where feminine variants of the same name are normally formed by adding of the highly productive suffix *-a* on the masculine name (*Dragan-a*, *Ivan-a*, *Branislav-a*, *Stanislav-a*, etc). Therefore, the reason for such an uncommon (but possible) formation *Pop+i+slava* should be the case of feminine proper names in *-slava* that are analogically reanalyzed as being formed by 'masc. proper name+*i+slava*' and not as correctly expected 'masc. proper name+*a*'³⁸ (here it should be *pop-a)

To sum up, this short TV-project example has shown that whatever the task is, children always prefer highly productive and frequent patterns (regular WFRs or analogical formations) to express their creativity and to invent new words.

³⁸ The child that coined the word *Popislava* took the simplex input noun as being a proper and not a common noun, presumably because the question was literally formulated as "*Kako se zove žena od popa?*" (*What is the name of priest's woman?*), which in this context in Serbian may refer to a proper name as well.

8. Some typological notes on Serbian productive morphology

The second theory of Natural Morphology, subtheory of typological adequacy, is mainly based on the ideas from Skalička (1979), i.e. on the concepts of linguistic types as ideal constructs. Different languages may approach these ideal language types to various degrees. Skalička claims that morphological subparts (e.g. inflection vs. derivation) behave separately with regard to typological characteristics. Furthermore, submodules of inflection within the same language may have miscellaneous typological properties, which may result in typological differences between noun and verb inflection systems of the same language (Dressler, 2005b). For example, Dressler (2005b) gives a scale of the languages with regard to their typological characteristics of noun (scale 1) and verb inflection (scale 2), starting from the properties of isolating type towards the ideal inflectional-fusional language type.

- 1). Noun infl.: French – Spanish – English – Dutch – Italian – German – Greek – Slavic lang. – Lithuanian
- 2). Verb infl.: English – Dutch – German – Spanish – French – Italian – Slavic lang. – Greek – Lithuanian

Productive morphology, i.e. the degree of morphological richness (i.e. only productive patterns) is very important for typology, since it represents its most important factor (Dressler, 2005b). Therefore, the role of morphology is greater (and the role of syntax smaller) in agglutinating than in inflectional-fusional languages. A more detailed analysis of typological properties of Serbian referring to inflectional, derivational morphology as well as the role of typology in first language acquisition will be given in the following parts of this section.

8.1. The inflectional class system from a typological point of view

In terms of the second subtheory (typological adequacy; cf. Dressler, 1985) of Natural Morphology, typological generalizations regarding the existence of inflectional classes are worth mentioning for the purpose of this Thesis.

Taking into consideration various studies conducted for different languages (cf. Dressler et al., 2006), it can be concluded that inflectional classes are the characteristics of the ideal inflecting-fusional language type, with different variations of complexity among them. For investigation of productivity among language types, the distinction between the morphological richness and complexity should also be considered. Morphological complexity is a wider term, as it comprises both productive and unproductive morphological patterns,

whereas morphological richness takes into account only productive morphological categories, rules and inflectional microclasses (Dressler, 1999; Dressler et al., 2006).

Therefore, strongly inflecting languages have the most complex structure on all levels, i.e. they generally have more macroclasses and a greater number of productive microclasses. In the ideal agglutinating type all morphological patterns are productive, whereas the ideal inflecting-fusional type has more productive than unproductive inflectional categories and rules, and many more unproductive than productive microclasses (Dressler et al., 2006). Consequently, agglutinating languages have no differentiation in terms of inflection classes (e.g. strong agglutinating) or have only few inflection classes (cf. Pöchtrager et al. 1998). For example, Turkish noun inflection has just two productive noun microclasses, and three verb microclasses.

On the other hand, some languages combine properties of the inflecting-fusional and the agglutinating or isolating type, and therefore have simpler inflection class system. Among all inflecting languages, English verb morphology is the poorest, as it has few productive categories and rules and just one productive microclass.

Lithuanian is considered to be the strongest inflecting-fusional language with the richest morphology among contemporary Indo-European languages (with 3 totally productive microclasses in verb inflection, out of 44 microclasses; cf. Dressler et al., 2006). Lithuanian is followed by Polish and then by other Slavic languages, among whom Serbian and Croatian. However, it is important to mention again that, within one language, typological properties may be different between the nominal inflection class systems and the verbal inflection system. For example, the French noun system is much more isolating than its verb system (cf. Dressler et al., 2003).

Considering the two scales in section 8, the whole group of Slavic languages lies near the ideal of inflecting fusional language type. There may be found certain differences between Slavic languages but they typologically all have very rich and complex morphology, which is also the case in the Serbian language.

8.2. The Word Formation from a typological point of view

Regarding different language types (Skalička, 1979) and the sybtheory of system adequacy (Dressler et al., 1987), generalizations about the productivity of word formation system of different language types can also be made.

Typically, as proposed by some authors, there is a great productivity of WFRs in introflecting languages such as in Arabic or in Hebrew (Bolotzky, 1999). There are lots of formations derived by productive WFRs and, at the same time, great distance between word

meaning and word formation meaning. Moreover, in these languages, many WFRs show lots of phonological alternations, such as ablaut. All these facts mean that both morphosemantic and morphotactic transparency are very low, even though these WFRs are very productive, which confirms the suggestion that productivity need not to be the same as transparency (section 2.2.3).

Regarding the inflecting-fusional language type (e.g. Slavic or Romance languages), there are less productive WFRs than in agglutinating type (e.g. Hungarian or Turkish). As explained by some authors (e.g. Dressler & Ladányi, 2000a) this happens due to the fact that lots of grammatical categories (e.g. negation, reflexives, etc.) belong to word formation morphology, and not to syntax, as in the inflectional-fusional type. Similarly, if we compare the same WFRs in two typologically different languages, namely one agglutinating and one inflecting, WFRs are found to be more productive in agglutinating languages. Dressler & Ladányi (2000b) gave an example that confirms this argument, namely they found out that denominal adjective formation rules in Hungarian show greater productivity, since they can be applied even to abbreviation, which is not possible in German. Thus, it can be concluded that agglutinating languages have less unproductive WFRs than inflectional-fusional languages. Agglutinating languages are found to express one grammatical meaning by one and always the same morphological form, which is known as the preference for biuniqueness. This is the reason why in agglutinating languages the number of productive WFRs is so high, whereas the number of unproductive WFRs is rather low, and there is also very little rule competition. Further differences show less productivity of the compounding in agglutinating languages than in inflecting languages. Vowel harmony (e.g. Hungarian: *falt* 'patch' → *faltos* 'patched' vs. *kerék* 'wheel' → *kerek-es* 'supplied with wheels') is a common characteristic of many agglutinating languages and is usually fully productive, with few exceptions only (Dressler, 2007). On the other hand, umlaut (e.g. German: *Hund* 'dog' → *Hünd-in*; *Wolf* 'wolf' → *Wölf-in*) is more common for the inflecting-fusional type and usually shows little productivity because there are lots of exceptions to certain rules (e.g. German: *Herzog* 'duke' vs. *Herzog-in*).

Regarding Serbian, it shows many typological properties of ideal inflecting-fusional type and it has a wide range of productive as well as unproductive derivational rules that contribute to the high level of morphological complexity.

8.3. Typology and First Language Acquisition

External evidence from child language has recently been connected to the morphological typology, in order to find some mutual challenges for other linguistic theories. Provided that typological characteristics are basic, i.e. higher than cross-linguistic perspective, it means that typological generalizations are basic and thus expected to emerge early in first language acquisition (cf. Dressler, 2005b).

Results from the “Crosslinguistic Project on Pre- and Protomorphology in Language Acquisition” (cf. Dressler et al. 1997b; Dressler, 2005b) show that the first typological differences occur in the premorphology phase. Children first acquire unmarked forms from the input (nominative, infinitives, imperative sg.), i.e. ‘unmarked before marked’. It means that in languages where 3P.Sg.Pres. is not affixed, this is the first verbal form to appear (e.g. agglutinating lang., Lithuanian, Polish, Croatian). This is found also in the analysed data of the Croatian-speaking girl Antonija, whose first verbal form was 3P.Sg.Pres., which also represents the default form. On the other hand, in languages where 1P.Sg.Pres. is unaffixed (e.g. English, Dutch), this is the first form to appear in child speech.

As previously confirmed from the various investigations of Antonija’s recordings, the great morphological richness has a positive influence on the early language acquisition. These results are in line with the Dressler’s (2005b) assumption that “children (...) are more ‘tuned’ to morphology if they are acquiring a morphology-rich language”, i.e. they are expected to detect morphology (emergence of first oppositions and mini-paradigms) earlier than children acquiring morphologically poor languages. However, as already stated at the beginning of the section 8 of this Thesis, different degrees of typological properties are present within the same language. Therefore, in French, children must first detect verb inflectional morphology, whereas in German there are much more productive patterns in noun inflection and composition, which means that children acquiring German will first detect morphology in these morphological submodules.

Another interesting typological property involves the existence of the more or less complex system of inflection classes in inflectional-fusional type whereas agglutinating languages ideally possess none or only few different inflectional classes (e.g. Hungarian, Finnish) (Dressler, 2003; 2005b). As a consequence, in highly inflecting languages with rich diminutive morphology, diminutives usually follow the declension pattern of the most productive inflectional classes, even if their simplex forms belong to unproductive inflectional classes. As already seen in previous chapters dealing with Serbian morphology, this is exactly the case with the Serbian, since all productively used diminutives and augmentatives belong to the most productive feminine and masculine inflectional classes. The same is also

true for derivation of agent nouns, since they all belong to the most productive inflectional classes only.

Therefore, all these typological characteristics are very important for first language acquisition, because they may explain certain properties of child language. For example, children acquiring an inflecting language with rich morphology tend to adopt productive patterns before the unproductive ones. Therefore, derived nouns (e.g. diminutives) belonging to a productive inflectional class are acquired before simplex nouns belonging to the unproductive ones (Palmović, 2007; Gillis, 1998). Due to this reason, the assumption that diminutives facilitate the acquisition of morphology in inflecting languages is justified. The same diminutive advantage is not present in agglutinating languages with no inflectional classes, such as in Turkish (cf. Dressler, 2005b). Another property with positive effects on language acquisition is morphotactical transparency. In Serbian, feminine diminutives are more transparent than masculines, which are very often built involving a palatalization (before the most productive suffix *-ić*). Thus, maybe this is the reason why in the analysed corpus the largest percentage of diminutives emerged in the Antonija's speech is represented by feminine diminutives.

Thus, productivity and morphological transparency are very important in the process of first language acquisition since they facilitate the acquisition of morphology in languages with complex morphological systems. However, the argumentation presented for the purpose of this Thesis is only an overview of the most important facts and findings and I am not going to discuss typological properties in first language acquisition in more detail.

To sum up briefly, results from the "Crosslinguistic Project on Pre- and Protomorphology in Language Acquisition" have shown many significant findings for the better understanding of the connection between typology and first language acquisition (Dressler, 2005b). During this project it was hypothesized and confirmed that children become aware of typological properties of a given languages and start to adapt to them from the early stages. Typological properties correspond to basic properties of the language, which are acquired by children already in the protomorphological phase.

Conclusion

There are plenty of discussions and different approaches on productivity from the most different perspectives: qualitative (providing definitions), quantitative (providing ways for measuring it) or psycholinguistic (providing different models). However, according to many scholars, the term 'productivity' is still considered to be one of the most controversial issues in current linguistic trends. The present Master Thesis is focused on the concept of productivity from the point of view of Natural Morphology. Within this theoretical model, productivity is defined as 'a primitive property of inflectional morphology' and as 'a characteristic of a potential system of grammar' (cf. Dressler, 2003).

The importance of the productive entities can be explained in terms of the difference between static and dynamic morphology. As first proposed by Dressler (1997), this distinction between the two morphologies may be explained by the fact that dynamic morphology consists of the productive morphological patterns (categories, rules and classes) whereas static morphology comprises the representations of stored morphological forms (cf. Dressler 2003). According to various models (e.g. race model: Frauenfelder and Schreuder, 1992) on the level of language performance there is a constant competition between rule mechanism and memorized storage, due to the interaction of various factors, such as productivity and frequency. In other words, the race model suggests that there is an overlapping application of rules and direct lexical access. It follows that 'isolated paradigms and unproductive microclasses must be lexically stored, whereas productive microclasses may be not' (Dressler et al., 1996: 129).

Within a class classification based on productivity, productive 'units' (i.e. rule, category, class, etc.) are important, central and are said to be the default for dynamic morphology (cf. Dressler 1999; Dressler, 2003). In contrast to them, unproductive units (e.g. isolated, suppletive paradigms) are not significant for the system of nominal and verbal inflection of one language, although such words may be very frequent (high token frequency, e.g. German strong verbs). Accordingly, within the model of Natural Morphology, the language-specific system adequacy must be based on the productive rules, categories and microclasses.

The present Master Thesis, which investigates the notion of productivity as one of the central questions in morphology, is concerned with the Serbian noun and verb inflectional classes and microclasses as well as with the two productive derivational processes (diminutivization and formation of agent nouns). This investigation describes the most productive inflectional and derivational patterns in this South Slavic language.

Being a typical member of inflecting language type, Serbian has a high degree of both morphological richness and morphological complexity, which is attested by the existence of a large amount of productive and unproductive noun and verbal macroclasses, classes and microclasses. As thoroughly discussed with examples in this Thesis, an inflectional microclass is defined as a set of paradigms that share exactly the same morphological and morphonological generalizations (cf. Dressler, 2003). I have used the well-established criteria (i.e. the scale of productivity) in order to investigate the most productive microclasses for both noun and verb inflectional system.

Most of the evidence is drawn from the analysis of loan words and their integration into the Serbian inflectional system. Apparently there are no uninflected, i.e. unintegrated loan words in the Serbian language. We need the highly productive patterns that are capable to overcome obstacles (e.g. unfitting properties, inadequate word-final shape or foreignness) in the process of loan words integration. It means that all loan words are accommodated only to the highly productive Serbian microclasses and that the Serbian inflectional system strives to the maximization of productivity and naturalness.

All foreign words ending in a consonant follow declension patterns of the two most productive masculine microclasses, namely I.1a₁ (e.g. Sg. *dribling*-Pl. *driblinz-i* 'dribbling', with the palatalization involved) and I.1b (e.g. Sg. *film*-Pl. *film-ov-i*, with the infix –ov- added usually in the cases of monosyllabic LWs). Regarding loan words ending in a vowel (other than –a), they are also adapted to the masculine microclass I.2a or I.2b (e.g. *auto*, *bife* 'buffet', *viski* 'whiskey', *intervju* 'interview'). It may be concluded that this masculine class (I.2) is a very productive pattern for all foreign words finishing in a vowel. Although there are many indigenous neuter words ending in –o (*selo* 'village') or –e (*polje* 'field') the conducted analysis of loan words in Serbian have shown that there are no foreign words in –o or –e (e.g. *bife*, *auto* are masculines in Serbian) that follow the declension patterns of any neuter microclasses. They are rather integrated as masculine nouns, which is one of the main reasons for assuming the neuter inflectional classes in –o/-e to be unproductive or to have lost their productivity (although the neuter gender is productive; for similar findings in Polish and Russian, cf. Dressler, 2003).

As for the feminine declension, the highly productive class is II.1 (with four microclasses), which comprises feminine nouns with the Nom. Sg. in -a, and Nom.Pl. in -e (e.g. Sg. *majka*, Pl. *majke* 'mother'). Among the two very similar productive microclasses from this class, one with the palatalization (II.1a₁) and another without it (II.1a₂), the more preferred one and the more productive one is (II.1a₂), as evidenced by many loan words that demonstrate no palatalization in Dat./Loc. Sg. when integrated (e.g. *koka*-Dat. Sg. *kok-i* 'Coke'; *šminka*-Dat. Sg. *šmink-i*, < Ger. *Schminke* 'make up').

Verbal inflectional system is even more complex in its nature, since there are many more productive and unproductive microclasses than in the inflectional system of nouns. Among them, it has been found that five microclasses are productive: I.1a (e.g. *kup-ov-a-ti* 'to buy'), I.1b (e.g. *do-pis-iv-a-ti* 'to correspond'), II.1.a (e.g. *mak-nu-ti* 'to move'), III.1 (e.g. *nos-i-ti* 'to carry') and IV (e.g. *gled-a-ti* 'to look') (Dressler et.al., 1996). These findings have mostly been attested to by numerous examples of loan verbs, i.e. all foreign verbs are adapted into one of these five microclasses.

Apart from the part dealing with the productivity in inflection, the present Thesis has provided some results in terms of the productivity of the two derivational processes- evaluative morphology (especially diminutives) and formation of agent nouns and motion suffix. Serbian displays rich inventories of evaluative suffixes but only few of them are found to be productive. For diminutive formation the most productive suffixes are *-(ć)ić* (for masculine bases), *-ica* (for feminine bases), *-ce* (for neuter bases). Augmentatives are generally less productive than diminutives, with *-etina* and *-ina* as more productive than other augmentative suffixes. The results from a written morphological evaluation test with 20 native speakers have confirmed these assumptions. The second derivational process studied for the purpose of the present Thesis is the deverbal formation of agent nouns (e.g. v. *pevati* 'to sing' > n. *pev-ač* 'singer'), which belongs to the prototypical morphology, since it involves the change of the word-class. Along with existing indigenous suffixes for feminine nouns, there is another very productive way for formation of feminine agent and person nouns, i.e. by adding of a motion suffix on an already coined masculine agent noun (e.g. v. *učiti* 'to teach' > n. *učitelj* 'teacher-MASC' > *učitelj-ica* 'teacher-FEM').

External evidence for the concept of naturalness and its phenomena, among which the productivity as the subject of this Thesis, has been provided by analysing of data from research on first language acquisition. The corpus of one Croatian-speaking girl (Antonija) has been used for the investigation of the productivity of the first emerged inflectional and derivational patterns. Outcomes of such an investigation have shown that in early stages of language acquisition of Croatian or Serbian, children tend to use only the forms that belong to the highly productive morphology of this language. This preference for the productiveness is in line with the preference for default and unmarked forms as well. All these assumptions are confirmed by substitutions, analogical formations or class shifts, which all go in the same direction- from the unproductive towards the most productive patterns, both in inflection as well as in derivation. Moreover, it has been proved (cf. Kovačević, 2009) that the high degree of morphological richness and complexity have positive effects on the first language acquisition of a given language.

The investigation of Serbian and Croatian language data from many perspectives (i.e. linguistic theory, Natural Morphology, first language acquisition) has also been used for

an explanation of the nature of inflectional and derivational productivity from the typological point of view. Moreover, a close relationship between typology and first language has been confirmed to exist, since many cross-linguistic studies have shown that most of typological characteristics are acquired in the earliest phase-in the so-called protomorphological phase. These results are very significant since they provide strong evidence for considering typological generalizations to represent the basic level of one language (cf. Dressler, 2005b).

All the findings obtained from the present Thesis can be used for further investigation and a more detailed study of the Serbian or Croatian language regarding other criteria and subtheories of Natural Morphology. For example, it may be used to investigate on which parameters of universal preferences the Serbian language is more natural (first subtheory) or how far the Serbian morphology deviates from the ideal type of an inflecting language (second subtheory). Moreover, further investigation within the third subtheory leaves the place for comparison of system defining properties of Serbian with morphological systems of other languages, e.g. the number of productive inflectional categories, rules, microclasses in Serbian contrasted with such results from other languages, in order to find out which language is more morphologically rich. For example, considering only the basic facts from the study of Dressler et al. (1996) (e.g. number of productive verbal and microclasses and the degree of productivity of the nominal inflectional system) there are seven productive verbal microclasses in Polish vs. five in Croatian/Serbian. Moreover, the neuter gender has lost its productivity in Croatian (thus also in Serbian), which makes Polish be morphologically 'richer'.

In conclusion, the more profound and detailed analysis, taking into consideration other and the more complex criteria (e.g. the hierarchical depth of classification), may complicate the contrastive analyses, making it a challenging task.

References

- Anderson, Stephen R. (1982). *Where's morphology?* Linguistic Inquiry 13, 571-612.
- Aronoff, Mark (1976). *Word Formation in Generative Grammar*. Cambridge: MIT Press.
- Baayen, Harald R. (1989). *A Corpus-Based Study to Morphological Productivity: Statistical Analysis and Psycholinguistic Interpretation*. PhD thesis, Vrije Universiteit Amsterdam.
- Baayen, Harald R. & Rochelle Lieber (1991). *Productivity and English word-formation: a corpus-based study*. Linguistics 29, 801-843.
- Baayen, Harald R. & Robert, Schreuder. (1991). *War and peace: Morphemes and full forms in a non-interactive activation parallel route model*. Brain and Language 68, 27-32.
- Baayen, Harald R. (1992). "Quantitative Aspects of Morphological Productivity". In: Geert Booij & Jaap van Marle (Eds.). *Yearbook of Morphology 1991*. Dordrecht-Boston-London: Kluwer, 109-149.
- Baayen, Harald R. (1993). "On frequency, transparency and productivity." In: G. Booij and J. van Marle (Eds.). *Yearbook of Morphology 1992*. Dordrecht: Kluwer, 181-208.
- Baayen, Harald R. & Antoinette, Renouf. (1996). *Chronicling The Times: productive lexical innovations in an English newspaper*. Language 72, 69-96.
- Babić, Stjepan (1991). *Tvorba riječi u hrvatskom književnom jeziku: nacrt za gramatiku [An outline of Croatian grammar: word formation]*. Zagreb: Djela Hrvatske akademije znanosti i umjetnosti.
- Bauer, Laurie (1983). *English Word-Formation*. Cambridge: Cambridge University Press.
- Bauer, Laurie (1988). *Introducing Linguistic Morphology*. Edinburgh: Edinburgh University Press.
- Bauer, Laurie (2001). *Morphological Productivity*. Cambridge: Cambridge University Press.
- Bauer, Laurie (2004). "The function of word-formation and the inflection-derivation distinction." In: Aertsen Henk, Mike Hannay & Rod Lyall (Eds.). *Words in their Places. A Festschrift for J. Lachlan Mackenzie*. Amsterdam: Vrije Universiteit, 283-292.
- Bauer, Laurie (2005). "Productivity: theories". In: Štekauer Pavol & Rochelle Lieber (Eds.). *Handbook of word-formation*. Dordrecht: Springer, 315-334.
- Bolozky, Shmuel (1999). *Measuring Productivity in Word Formation. The case of Israeli Hebrew*. Leiden: Brill.
- Booij, Geert (1977). *Dutch morphology. A study of word formation in generative grammar*. Dordrecht: Foris Publications.
- Booij, Geert (1996). "Inherent versus contextual inflection and the split morphology hypothesis." In: Booij, Geert & Jaap van Marle (Eds.). *Yearbook of Morphology 1995*. Dordrecht: Kluwer, 1-16.
- Booij, Geert (2000). "Inflection and derivation". In: Booij Geert, Christian Lehmann & Joachim Mugdan (Eds.). *Morphologie /Morphology. An International Handbook on Inflection and Word-Formation. Vol. I*. Berlin: Walter de Gruyter, 360-369.
- Chitasvilli, Revas J. & Harald Baayen (1993). "Word Frequency Distributions." In: Hrebicek L. & G. Altmann (Eds.). *Quantitative Text Analysis*. Trier: WVT, 54-135.
- Clahsen, Harald, Ingrid Sonnenstuhl & James P. Blevins (2003). "Derivational morphology in the German mental lexicon: a dual mechanism account." In: Baayen Harald & R. Schreuder

(Eds.). *Morphological Structure in Language Processing*. Berlin: Mouton de Gruyter, 125-155.

Corbin, Danielle (1987). *Morphologie dérivationnelle et structuration du lexique*. Tübingen: Niemeyer.

Corbett, Greville (2009). "Morphology-Free Syntax: Two Potential Counter-Examples from Serbo-Croat." In: Franks Steven, Vrinda Chidambaram & Brian Joseph (Eds.). *A Linguist's Linguist: Studies in South Slavic Linguistics in Honor of E. Wayles Browne*. Bloomington: Slavica, 149-166.

Cztinglar, Christine & Katharina Köhler (2002). *The Copula in First Language Acquisition: A Comparison between German and Croatian Child Language*. Joint work by Christine Cztinglar, Katharina Köhler, Antigone Katicic & Chris Schaner-Wolles, University of Vienna & Austrian Academy of Sciences. Available online: http://homepage.univie.ac.at/christine.cztinglar/pdf/mpi-nijmegen_hdo.pdf

Dressler, Wolfgang U. (1985). *Typological aspects of Natural Morphology*. Wiener linguistische Gazette 36, 3-26.

Dressler, Wolfgang U., Willi Mayerthaler, Oswald Panagl & Wolfgang U. Wurzel (1987). *Leitmotifs in Natural Morphology*. Amsterdam: Benjamins.

Dressler, Wolfgang U. (1989). *Prototypical differences between inflection and derivation*. Zeitschrift für Phonetik, Sprachwissenschaft und Kommunikationsforschungen 42, 3-10.

Dressler, Wolfgang U. & Lavinia Merlini Barbaresi (1994). *Morphopragmatics: Diminutives and Intensifiers in Italian, German, and Other Languages*. Berlin: Mouton.

Dressler, Wolfgang U. & Jasna Makovec- Černe (1995). *Die ersten Stufen des Erwerbs der slowenischen Flexion. Eine Fallstudie*. Travaux du Cercle Linguistique de Prague 1, 249-260.

Dressler, Wolfgang U. & Annemarie Karpf (1995). *The theoretical relevance of pre- and protomorphology in language acquisition*. Yearbook of Morphology 1994, 99-122.

Dressler, Wolfgang U., Katarzyna Dziubalska-Kolaczyk & Antigone Katičić (1996). *A contrastive analysis of verbal inflection classes in Polish and Croatian*. Suvremena Lingvistika 22, 127-138.

Dressler, Wolfgang U. & Anna M. Thornton (1996). *Italian nominal inflection*. Wiener linguistische Gazette 57-59, 1-26.

Dressler, Wolfgang U. (1997). *On productivity and potentiality in inflectional morphology*. CLASNET Working Papers 7.

Dressler, Wolfgang U., Katarzyna Dziubalska- Kolaczyk, & Małgorzata Fabiszak (1997a). *Polish inflection classes within Natural Morphology*. Bulletin de la Société Polonaise de Linguistique 53, 95-119.

Dressler, W.U. (1997b)(ed.), *Studies in Pre- and Protomorphology*, Wien, Verlag der Österreichischen Akademie der Wissenschaften.

Dressler, Wolfgang U. (1999). "Ricchezza e complessità morfologica." In: *Fonologia e Morfologia dell'Italiano e dei Dialetti d'Italia. Atti del 21. congresso SLI*. Roma: Bulzoni, 587-597.

Dressler, Wolfgang U. & Natalia Gagarina (1999). "Basic questions in establishing the verb classes of contemporary Russian." In: Fleishman L. et al. (Eds.). *Essays in Poetics, Literary History and Linguistics. Festschrift V.V. Ivanov*. Moscow: OGI, 754-760.

Dressler, Wolfgang U. (2000). "Naturalness". In: Booij, Geert et al. (Eds.). *Morphologie: Ein internationales Handbuch zur Flexion und Wortbildung I*. Berlin: De Gruyter, 288-296.

Dressler, Wolfgang U. & Mária Ladányi (2000a). *Productivity in word formation (WF): a morphological approach*. Acta Linguistica Hungarica 47, 103-144.

Dressler, Wolfgang U. & Mária Ladányi (2000b). "On contrastive word formation: German and Hungarian denominal adjective formation." In: Dalton-Puffer C. & N. Ritt (Eds.). *Words: Structure, Meaning, Function: A Festschrift for D. Kastovsky*. Berlin- New York: Mouton de Gruyter, 59-74.

Dressler, Wolfgang U., Gary Libben, Jacqueline Stark, Christiane Pons & Gonia Jarema (2001). *The processing of German interfixed compounds*. Yearbook of Morphology 1999, 185-220.

Dressler, Wolfgang U. (2003). *Degrees of grammatical productivity in inflectional morphology*. Italian Journal of Linguistics 15, 31-62.

Dressler, Wolfgang U., Marianne Kilani-Schoch, Rossella Spina & Anna M. Thornton (2003). "Le classi di coniugazione in italiano e francese." In: Giacomo-Marcellesi Mathée & Alvaro Rocchetti (Eds.). *Il Verbo Italiano*. Roma: Bulzoni, 397-416.

Dressler, Wolfgang U. (2005a). "Word-formation in Natural Morphology." In: Štekauer Pavol & Rochelle Lieber (Eds.). *Handbook of word-formation*. Dordrecht: Springer, 267-284.

Dressler, W.U. (2005b). "Morphological typology and first language acquisition: some mutual challenges." In: G. Booij, E. Guevara, A. Ralli, S. SgROI & S. Scalise. (eds.). *Morphology and linguistic typology. On-line Proceedings of the Fourth Mediterranean Morphology Meeting (MMM4), Catania, 21-23.9.2003*. University of Bologna.

Dressler, Wolfgang U., Marianne Kilani-Schoch, Natalia Gagarina, Lina Pestal & Markus Pöchtrager (2006). *On the Typology of Inflection Class Systems*. Folia Linguistica 40, 51-74.

Dressler, Wolfgang U. (2007). "Productivity in word formation." In: G. Jarema & G. Libben (Eds.). *The Mental Lexicon: Core Perspectives*. Amsterdam: Elsevier, 159-183.

Dressler, Wolfgang U. (2012). "Natural Morphology." In: Spencer A. (Ed.). *Handbook of Morphology*. Oxford: Oxford University Press.

Gaeta, Livio & Davide Ricca (2003). *Frequency and productivity in Italian derivation: A comparison between corpus-based and lexicographical data*. Italian Journal of Linguistics / Rivista di Linguistica 15/1, 63-98.

Gaeta, Livio & Davide Ricca (2006). *Productivity in Italian word formation: A variable-corpus approach*. Linguistics 44/1, 57-89.

Gagarina, Natalia (2009). "The acquisition of case and number in Russian". In: Ursula Stephany & Maria Voeikova (Eds.). *Cross-linguistic approaches to the acquisition of case and number*. Berlin: de Gruyter. 179-215.

Gillis, Steven (Ed.). (1998). *Studies in the Acquisition of Number and Diminutive Marking*. Antwerp Studies in Linguistics, 95.

Filipović, Rudolf (1990). *Anglicizmi u hrvatskom ili srpskom jeziku : porijeklo - razvoj – značenje*. Zagreb: Školska knjiga.

Frauenfelder, Uli H. & Robert Schreuder (1992). *Constraining psycholinguistic models of morphological processing and representation: the role of productivity*. Yearbook of Morphology 1991, 165-183.

Haman, Ewa, Andrea Zevenbergen, Melissa Andrus & Marta Chmielewska (2009). *Coining Compounds and Derivations – A Crosslinguistic Elicitation Study of Word-Formation Abilities of Preschool Children and Adults in Polish and English*. Polish Psychological Bulletin 40, 21-37.

Halle, Morris (1973). *Prolegomena to a theory of word formation*. Linguistic Inquiry 4, 3-16.

- Hay, Jennifer (2000). *Causes and consequences of word structure*. PhD thesis, Northwestern University.
- Hay, Jennifer (2001). *Lexical frequency in morphology: Is everything relative?* *Linguistics* 39/6, 1041-1070.
- Hay, Jennifer & Harald Baayen (2002). "Parsing and productivity." In: Booij G. & J. van Marle (Eds.). *Yearbook of morphology 2001*. Dordrecht/Boston/London: Kluwer, 203-235.
- Hay, Jennifer & Harald Baayen (2003). *Phonotactics, parsing and productivity*. *Italian Journal of Linguistics* 15, 99-130.
- Jakobson, Roman (1941). *Kindersprache, Aphasie und allgemeine Lautgesetze*. Uppsala: Almqvist & Wiksell.
- Kastovsky, Dieter (1986). *The Problem of Productivity in Word Formation*. *Linguistics* 24, 585-600.
- Katičić, Antigone (1997). *Zum Erstspracherwerb des Kroatischen: Morphologische und syntaktische Aspekte beim Erwerb des Verbalsystems*. M.A. thesis, University of Vienna.
- Katičić, Antigone (2003). "Early Verb Development in one Croatian Speaking Child". In: Bittner Dagmar, Wolfgang U. Dressler & Marianne Kilani-Schoch (Eds.). *Development of Verb Inflection in First Language Acquisition*. Berlin: Mouton de Gruyter.
- Kempe, Vera, Nada Seva, Patricia J. Brooks, Natalija Mironova, Angelina Pershukova & Olga Fedorova (2009). *Elicited production of case-marking in Russian and Serbian children: Are diminutive nouns easier to inflect?*. *First Language* 29/147.
- Klégr, Aleš & Jan Čermák (2009). 'Neologisms of the "On-the-Pattern-of" Type: Analogy as a word-formation process?' In: Procházka Martin, Markéta Malá & Pavlína Šaldová (Eds.). *The Prague School and Theories of Structure Interfacing Science, Literature, and the Humanities*. Goettingen: V&R Unipress.
- Körtvélyessy, Livia & Stekauer Pavel (2011). *Diminutives and Augmentatives in the Languages of the World*. E-Journal in English Lexicology-Lexis.
- Kovačević, Melita (2003). *Acquisition of Croatian in Crosslinguistic Perspective*. University of Zagreb.
- Kovačević, Melita, Palmović Marijan & Hržica, Gordana (2009). "The Acquisition of Case, Number and Gender in Croatian". In: Stephany, Ursula & Voeikova, Maria (Eds.). *Development of Nominal Inflection in First Language Acquisition: A Cross-Linguistic Perspective*. Berlin: Mouton De Gruyter, 153-177.
- Krusinga, Etsko (1932). *A Handbook of Present-Day English*. Groningen: Noordhoff.
- Laaha, Sabine, Dorit Ravid, Katharina Korecky-Kröll, Gregor Laaha & Wolfgang U. Dressler (2006). *Early noun plurals in German: regularity, productivity or default?* *Journal of Child Language* 33, 271-302.
- Laaha, Sabine & Steven Gillis (2007). *Typological perspectives on the acquisition of noun and verb morphology*. *Antwerp Papers in Linguistics* 112.
- Libben, Gary (1998). *Semantic transparency in the processing of compounds: consequences for representation, processing and impairment*. *Brain and Language* 61, 30-44.
- Lieber, Rochelle (1980). *On the Organization of the Lexicon*. PhD thesis, MIT, Cambridge.
- Marle, Jaap van (1985). *On the Paradigmatic Dimension of Morphological Creativity*. Dordrecht: Foris.
- Manova, Stela (2005). "Derivation versus Inflection". In: Dressler, W., Dieter Kastovsky, Oskar E. Pfeiffer, Franz Rainer. *Morphology and its demarcations*. Amsterdam: Benjamins.

- Matthews, Peter H. (1974). *Morphology*. Cambridge: Cambridge University Press.
- Mayerthaler, Willi (1981). *Morphologische Natürlichkeit*. Wiesbaden: Athenaion
- McLennan, Sean (1996). *Sociolinguistic Analysis of Serbo-Croatian*. Calgary Working Papers in Linguistics, 18.
- MacWhinney, Brian (2011). *The CHILDES Project: Tools for Analyzing Talk-Electronic Edition*. Carnegie Mellon University (accessible online at: <http://chilides.psy.cmu.edu>)
- Milin, Petar, Dušica Filipović Đurđević, Fermin Moscoso del Prado Martin (2009). *The simultaneous effects of inflectional paradigms and classes on lexical recognition: Evidence from Serbian*. Journal of Memory and Language 60, 50-64.
- O'Grady, William & Sook Whan Cho (2008). "First Language Acquisition". In: O'Grady, William & John Archibald (Eds.). *Contemporary Linguistic Analysis*. Scarborough: Prentice Hall, 326-362.
- Pavlović, Marijan (2007). "The acquisition of diminutives in Croatian." In: Savickiene, Ineta & Wolfgang U. Dressler (2007). *The Acquisition of Diminutives: Cross-linguistic Perspective*. Amsterdam: Benjamins.
- Peirce, Charles S. (1965). *Collected Papers*. Cambridge: Harvard University Press.
- Plag, Ingo (1999). *Morphological productivity. Structural constraints in English derivation*. Berlin- New York: Mouton de Gruyter.
- Plag, Ingo (2004). "Productivity". In: Aarts Bas & April McMahon (Eds.). *Handbook of English Linguistics*. Berlin: Mouton de Gruyter.
- Plank, Frans (1994). "Inflection and derivation." In: Asher Robert E. (Ed.). *The Encyclopedia of Language and Linguistics*. Oxford: Pergamon Press, 1671-1678.
- Pöchtrager, Markus, Csanád Bodó, Wolfgang U. Dressler & Teresa Schweiger (1998). *On some inflectional properties of the agglutinating type, illustrated from Finnish, Hungarian and Turkish inflection*. Wiener linguistische Gazette, 62-63, 57-92.
- Sanders, Gerald (1988). "Zero Derivation and the overt Analogue criterion." In: Hammond Michael & Michael Noonan (Eds.). *Theoretical Morphology*. San Diego, California: Academic Press, 155-175.
- Savickiene, Ineta & Wolfgang U. Dressler (2007). *The Acquisition of Diminutives: Cross-linguistic Perspective*. Amsterdam: Benjamins.
- Savickiene, Ineta, Wolfgang U. Dressler, Virág Barcza, Péter Bodor, Nihan Ketrez, Katharina Korecky-Kröll, Marijan Palmović, Ursula Stephany & Evangelia Thomadaki (2007). "Diminutives as pioneers of derivational and inflectional development – a cross-linguistic perspective." In: Laaha S. & S. Gillis (Eds.). *Typological perspectives on the acquisition of noun and verb morphology*. Antwerp Papers in Linguistics 112, 81-92.
- Savić, Svenka (2009). "Uputstva za standardizaciju rodno osjetljivog jezika". In: *Njegoševi dani 1, Zbornik radova sa međunarodnog slavističkog naučnog skupa*. Nikšić: Univerzitet Crne Gore, 301-320.
- Scalise, Sergio (1984). *Generative Morphology*. Dordrecht: Foris.
- Schultink, Henk (1961). *Produktiviteit als morfologisch fenomeen*. Forum der Letteren 2, 110-125.
- Skalička, Vladimir (1979). *Typologische Studien*. Braunschweig: Vieweg.
- Spencer, Andrew (1991). *Morphological theory: An introduction to word structure in generative grammar*. Cambridge: Cambridge University Press.

Spina, Rossella & Wolfgang U. Dressler (2003), "Variazione morfologica nella flessione verbale italo romanza." In: Bauer R. & H. Goebel (Eds.). *Parallela 9*. Wilhelmsfeld: Egert, 389-408.

Stampe, David (1973). *A Dissertation on Natural Phonology*. Bloomington: IULC.

Stanojčić, Živojin & Ljubomir Popović (2011). *Gramatika srpskog jezika (za gimnazije i srednje škole)*. Beograd: Zavod za udžbenike.

Stephany, Ursula & Voeikova, Maria (Eds.) (2009). *Development of Nominal Inflection in First Language Acquisition: A Cross-Linguistic Perspective*. Berlin: Mouton De Gruyter.

Stevanović, Mihailo (1964). *Savremeni srpskohrvatski jezik I*. Beograd: Naučna knjiga.

Subotić, Dragutin & Nevill Forbes (1926). *Serbian Grammar*. Oxford: Clarendon Press.

Szymanek, Bogdan (2005). "The latest trends in English Word-Formation." In: Štekauer Pavol & Rochelle Lieber (Eds.). *Handbook of word-formation*. Dordrecht: Springer, 429-448.

Ševa, Nada, Vera Kempe, Patricia J. Brooks, Natalija Mironova, Angelina Pershukova & Olga Fedorova (2007). Cross-linguistic evidence for the diminutive advantage: Gender agreement in Russian and Serbian children. *Journal of Child Language*, 34(1), 111–131.

Težak, Stjepko & Stjepan Babić (1992). *Gramatika hrvatskoga jezika*. Zagreb: Školska knjiga.

Williams, Edwin (1981). *On the notions 'lexically related' and 'head of a word'*. *Linguistic Inquiry* 12, 245–274.

Wurzel, Wolfgang U. (1984). *Flexionsmorphologie und Natürlichkeit*. Berlin: Akademie-Verlag.

Zemskaja, Elena (1996). *Russkij jazyk konca XX stoletija (1985 - 1995)*. Moskva: Jazyki Russkoj Kul'tury.

Zwicky, Arnold M. (1989). *What's become of derivations? Defaults and invocations*. *Proceedings of the Annual Meeting of the Berkeley Linguistics Society* 15, 303–320.

Dictionaries

Rečnik srpskohrvatskoga književnog jezika (1967-1976). Novi Sad: Matica srpska.

Vujaklija, Milan. (1991). *Rečnih stranih reči i izraza*. Beograd: Prosveta.

Klajn, Ivan. (2004). *Rečnik jezičkih nedoumica*. Beograd: Srpska školska knjiga.

Morfološki rečnik srpskog jezika, available on the Internet: <http://www.lexicom.rs>

Abstract (English)

The present Master Thesis explores the notion of productivity of inflectional and derivational system in the Serbo-Croatian language within the Framework of Natural Morphology. The theoretical part encompasses a summary of the most relevant qualitative, quantitative and psycholinguistic approaches to the study of productivity. The main purpose of the Thesis is to investigate productivity of noun and verb microclasses in the Serbian language. A novel classification of nouns- in terms of macroclasses, classes and microclasses, has been proposed in order to account for a much more insightful analysis of the productive patterns. The special focus has been placed on the integration of loan words with fitting and unfitting morphological properties.

In addition, one entire chapter is dedicated to the productivity in derivation (in general) and in the investigated language (i.e. Serbian or Croatian). An evaluation test, in which 20 native speakers of the Serbian language filled in the forms with the diminutives and augmentatives of 33 loan and indigenous words, was conducted. The results of this evaluation demonstrated that all diminutives and augmentatives were formed in a very productive manner and that these coinages belong to the most productive Serbian microclasses. Furthermore, the productivity of *nomina agentis* and feminine motion was descriptively analyzed.

External evidence for the morphological productivity of the established inflectional classes and diminutive formation has been acquired from the available research in first language acquisition, more precisely from the corpus of one Croatian-speaking girl (Antonija, CHILDES database). This chapter is intended as an additional contribution to the investigation and analysis of the early development of morphological forms in Serbian or Croatian. Special emphasis has been placed on the productivity of the early emerged forms as well as to the language development within the investigated period (1;3-2;8). Based on the analyzed corpus, the primary result shows that the initial noun and verb forms belong to the most productive inflectional microclasses. Moreover, it has been confirmed that diminutives are one of the very first grammatical forms that appear in child speech.

Finally, the concluding chapter is going to provide an overview of the typological properties of the Serbian language, as well as evidence for the relationship of typology with inflection, word formation and first language acquisition. The findings of this investigation are summarized in combination with more general reflections about the productivity in inflection and derivation in terms of Natural Morphology. In conclusion, suggestions for further research from a crosslinguistic perspective will be provided.

Abstract (German)

Die vorliegende Masterarbeit befasst sich mit der Produktivität des serbokroatischen Flexions- und Derivationssystems im Rahmen der Natürlichen Morphologie. Im theoretischen Teil wird eine Zusammenfassung der relevantesten qualitativen, quantitativen und psycholinguistischen Untersuchungen der Produktivität dargestellt. Das zentrale Ziel besteht darin, produktive morphologische nominale und verbale Mikroklassen im Serbischen aus der Sicht der Natürlichen Morphologie zu untersuchen. Es wird eine neue Klassifikation von Nomina in Klassen vorgestellt, welche besser für eine Analyse der produktiven Muster als die traditionelle Klassifikation geeignet ist. Im Besonderen wird der Frage nachgegangen, welche nominale und verbale Mikroklassen bei der Integration von Lehnwörtern mit passenden und unpassenden morphologischen Eigenschaften bevorzugt bzw. produktiv sind.

Außerdem, widmet sich ein eigenes Kapitel der Produktivität in Derivation (im Allgemeinen) und in der untersuchten Sprache (Serbokroatisch). Ein Fragebogen wurde von 20 serbischen MuttersprachlerInnen ausgefüllt, um postulierte produktive Diminutiv- und Augmentativsuffixe zu überprüfen: Mit der Befragung sollten die Diminutiva und Augmentativa von insgesamt 33 fremden und einheimischen Wörtern erhoben werden. Eine Interpretation der Ergebnisse wurde dargelegt, woraus sich die Folgerung ergibt, dass alle von Muttersprachlerinnen gebildeten Diminutiva und Augmentativa sehr produktiv sind und zu produktivsten nominalen Mikroklassen gehören. In der Folge wird die Produktivität der Nomina Agentis und Motionsuffixe mit den damit verbundenen theoretischen Ansätzen behandelt.

Externe Evidenz für die morphologische Produktivität der in dieser Arbeit geschilderten flexivischen Mikroklassen und Diminutivsuffixe wurde im Erstspracherwerb, genauer gesagt am Fallbeispiel eines aus Kroatien stammenden Mädchens (Antonijas Korpus, CHILDES), gefunden. Dieser Teil ist als ein kleiner Beitrag zur Untersuchung des serbokroatischen Erstspracherwerbs und zur Analyse der ersten Formen gedacht. Das Augenmerk wurde bei dieser Untersuchung sowohl auf Fragen über das Entstehen der ersten morphologischen Formen im Sprachgebrauch des Kindes als auch über die sprachliche Entwicklung im untersuchten Zeitraum (1;3-2;8) mit besonderem Interesse an Produktivität und produktiven Mikroklassen gerichtet. Aufgrund des im Rahmen dieser Masterarbeit untersuchten Datenmaterials kann festgestellt werden, dass die ersten entstandenen Formen im Erstspracherwerb zu den produktivsten nominalen und verbalen Mikroklassen gehören. Dennoch sprechen die Ergebnisse dafür, dass Diminutiva einer der ersten grammatischen Kategorien im Sprachgebrauch der Kinder sind.

Ein Ausblick auf typologische Eigenschaften der serbischen Sprache in Bezug auf Flexion, Derivation und Erstspracherwerb schließt die Arbeit ab. Zum Schluss werden die Ergebnisse gemeinsam mit allgemeineren Überlegungen über Produktivität der Flexion und Derivation in der serbischen Sprache im Rahmen der Natürlichen Morphologie zusammengefasst.

Die Ergebnisse dieser Untersuchung der produktiven Formen in der serbokroatischen Sprache könnten auch sowohl als Grundlage für künftige erweiterte Untersuchungen als auch für Vergleiche mit weiteren Daten aus anderen Sprachen dienen.

Appendix

Morphological evaluation test

deminutivi > -ak: cvet > cvetak; -ić/-čić: prozor > prozorčić; -ac: brat > bratac; če: pastir > pastirče;
 -ica: buba > bubica; -če: kamila > kamilče; -ce: drvo > drvce; -ance/-ence: dete > detence;
 -ašce/-ešce: jagnje > jagnješce / -e: prica > ptiče
augmentativi > -ina: glas > glasina; komad > komadina; -čina lažov > lažovčina; -urda: glava > glavurda; -etina: ruka > ručetina; -ina: vojnik > vojničina; -urina/-urda: noga > nožurina/nožurda

1. Napisi odgovarajuće deminutive i augmentative za sledeće imenice:

ajpod- AJPODIĆ / AJPODČE / AJPODČINA
 kompjuter KOMPJUTERČIĆE / KOMPJUTERČINA
 pica PICIĆA / PICETIVA
 aparat APARATČIĆ / APARATČINA
 radio RADIJAK / RADIJČINA
 kabal KABLIĆ / KABLINA
 hard disk HARD DISKIĆ / HARD DISKČINA
 sako SAKOIĆ / SAKOČINA
 auto AUTOĆ / AUTINA, AUTČINA
 kimono KIMONIĆ / KIMONČINA (KIMONČIĆ)
 sofa SOFIĆA / SOFČINA

staklo STAKLENC / STAKLINA
 momak MOMČIĆ / MOMČINA
 vojnik VOJNIČIĆ / VOJNIČINA
 voće VOĆENEC / VOĆČINA
 konac KONČIĆ / KONČINA
 slanina SLANINICA / SLANINČINA
 gospodin GOSPODINIĆ / GOSPODINČINA
 grlo GRLONC / GRLOČINA
 bokal BOKALČE / BOKALČINA
 trn TRNČIĆ / TRNČINA
 šegrt ŠEGRTČIĆ / ŠEGRTČINA
 kralj KRALJČIĆ / KRALJČINA
 otpor OTPORČIĆ / OTPORČINA
 pozdrav POZDRAVČIĆ / POZDRAVČINA
 miris MIRIŠČIĆ / MIRIŠČINA
 grudi GRUDENCA / GRUDČINE
 vašar VAŠARČIĆ / VAŠARČINA
 prsluk PRSLUČE / PRSLUKČINA
 mačak MAČKIĆ / MAČKINA
 brdo BRDENCE / BRDČINA
 pevač PEVAČIĆ / PEVAČINA
 pevačica PEVAČIČICA / PEVAČIČETINA

Curriculum vitae

Personal data

Name	Tijana Radisavljević
E-mail	laura_tijana86@hotmail.com
Nationality	Serbian

Education

From October 2010	University of Vienna, Austria Master Study in General Linguistics
2006- 2009	University of Salerno, Italy Bachelor of Arts Foreign Languages and Literature
2001- 2005	High School of Linguistics, Belgrade, Serbia Diploma in Modern Languages- Italian language

Languages

Mother tongue	Serbian
English	excellent (C1 level)
Italian	native- like (CELI Certificate C2 level)
German	excellent (Goethe Zertifikat C1 level)
Spanish	good (B1 level)