Foundations of Linguistics
Project Title: Language profile - Macedonian
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1 Introduction

Macedonian (македонски јазик, makedonski jazik) is part of the eastern group of the South Slavic branch of the Slavic languages, member of the Indo-European language family. It is spoken by 1.4 - 3.5 million speakers. Macedonian is the official language of North Macedonia. Most speakers who speak the language live in North Macedonia, and a smaller number can be found in the diaspora. The largest immigrant communities speaking Macedonian are in Australia, Canada and the USA.It is also a recognised minority language in Albania, Serbia, Bosnia and Herzegovina and Romania(Wikipedia (2020b)).

Macedonian is written using an adapted 31-letter version of the Cyrillic alphabet with six original letters. There are 29 dialects of Macedonian recognised by linguists, grouped in two groups: western and eastern.

2 Morphology

2.1 Nouns

2.1.1 Gender

Macedonian has three genders: masculine, feminine and neuter, and all nouns fall into one of these three classes. Gender is neutralised in the plural, except a highly restricted distinction in quantified plurals (2.1.1. Friedman (2001))

Девојката стана   од   масата.
Devojka-ta stan-a   od   masa-ta.
Girl-F.DEF got up-PST.3SG from table-F.DEF
"The girl got up from the table."

Момчето   стана   од   масата.
Momče-to   stan-a   od   masa-ta.
Boy-N.DEF got up-PST.3SG from table-F.DEF
"The boy got up from the table."

The examples above illustrate a few characteristics of the nouns in Macedonian.

There are exceptions, but most of the nouns ending in a consonant are masculine. All nouns ending in a vowel are feminine if they end in an -a or refer to a female being, otherwise neuter. We can see that reflected in the example with the girl.

2.1.2 Definiteness

In the example above, we can see the affixes, -ta and -to respectively, marked with DEF. The shape of the definite article is based primarily on form, with some regard for gender and number.(2.1.3.1 Friedman (2001)). In this case we can see the gender reflected in the -ta, having an -a ending to reflect the female, and in the -to, having an -o ending to reflect the neuter. In plurals, the ending would be (in most cases) -te.

Macedonian is the only Slavic literary language with a tripartite distinction mirroring the same distinction in demonstratives, viz. unmarked -t- proximate-v-, distal -n-.(2.1.3 Friedman (2001)).

What this means we can explore by looking at different examples.

- Jac го видов човекот (Jas go vidov čovekot, 'I saw the man', medial): the subject, 'man', is either close to the interlocutor or its position is unspecified;

- -Jac го видов човеков (Jas go vidov čovekov, 'I saw the man', proximal): the subject, 'man', is close to the speaker (and possibly the interlocutor(s) as well);

- Jac го видов човекон (Jas go vidov čovekon, 'I saw the man', distal): the subject, 'man', is far from both the speaker and the interlocutor(s).

2.1.3   Case

When it comes to case, the maximum possible differentiation in the noun is nominative/oblique/vocative, and this is only in certain male proper names and kinship terms(2.1.4 Friedman (2001)). In all other ways, the elaborate case system of the other Slavic languages are in Macedonian and Bulgarian lost.

2.2   Adjectives

Adjectives inflect for gender, number and definiteness(2.2.1 Friedman (2001)). Most masculine end in a consonant, female in -a and neuter in -o.

Добредојде во мојата   убава,   топла куќа.
Dojbredojde vo moja-ta   ubav-a,   topl-a kukj-a.
Welcome   to my-F.DEF beautiful-F warm-F house-F.
"Welcome to my beautiful, warm house."

Повели, земи од мекиве   перници, стави на тврдиов   под, и   седни.
Poveli, zemi od meki-ve   pernici, stavi na tvrd-iov   pod, i   sedni.
Please,   take from soft-PL.DEF pillows, put   on hard-M.DEF floor, and sit.
"Please, take from the soft pillows, put some on the hard floor, and sit."

In the examples above we can see the affixes that change according to gender and number(and the type of definiteness in the second example, proximal in this case).

What we can also see here is the demonstrated agreement. In the first example, the noun 'house' is feminine, so both of the adjectives before take the ending -a, to agree with the noun. In the second example, the noun 'pillows' is in plural, so we can see the adjective right before agree with a plural ending. We also have the noun 'floor' which is masculine, and the adjective right before agreeing with a masculine ending.

2.3   Pronouns

Ти, гледаш ли   што прави   тој?
Ti, gleda-š li   što prav-i   toj?
2SG see-2SG QU what doing-M.3SG M.3SG?
"Do you see what he is doing?"

In this example, we could see the pronoun for second person singular as well as the male, third person singular. There are short and long versions of the pronouns. Short forms are clitics and are used for the objects of verbs and for possessive and ethical datives. Long forms are used as

the objects of prepositions. The two forms are used together for emphasis and in connection with object reduplication.(2.3.1 Friedman (2001)).

Pronouns agree with nouns when it comes to gender, number and definiteness. In the example under, the first pronoun is agreeing with the plural noun 'children' and the second with the singular with the female happiness, as well as the first person singular perspective of the speaker.

Мои   деца,   моја   среќа.
Moi   deca,   moja   srekja.
My-PL.IDF children, my-F.1SG.IDF happiness.
"My children, my happiness"

2.4   Verbs

Verbs inflect for person, number, gender, tense, subordinate aspect, mood, status, taxis and resutativity. Other categories, including voice, futurity, and other types of modality,are all expressed syntactically (by context or particles).(2.5.1. Friedman (2001)).

Мечката   тргна   да ја   лапне   лисицата.
Mečka-ta   trg-na   da ja   lap-ne   lisica-ta.
Bear-F.DEF go-3SG.PST to it-F.ACC eat-3SG.PST fox-F.DEF.
"The bear went to eat the fox."

In this example, we can see that both of the verbs 'go' and 'eat' are inflected for tense and person.

The verbal l-form, which affixes -l, -la and -lo to the imperfect and aorist stems agrees in gender with the gender and number of the subject.(2.5.1.3 Friedman (2001)). The verbal l-form is used to form several different (past and future) tenses. In the example under, the verb know is in agreement with the subject 'She' and has a female ending -la.

Таа знаела   дека тоа ќе се   случи.
Taa znae-la   deka toa kje se   sluči.
She know-F.PST that that will ITR happen.
"She knew that that will happen".

Most verb forms can be predicted from the third singular present. Remaining forms can usually be predicted from the first singular aorist, which preserves some of the alternations characteristic of the infinitive stem in other Slavic languages. The third singular present ends in /-a/, /-i/, or /-e/, and is identical to the present stem. (2.5.1.2 Friedman (2001))

Чекајќи   си   го   кафето за носење,   се   муртеше зошто не е
поканет   на нејзината забава.
Čekaj-kji   si   go   kafeto za nose-nje, se   murteše zošto ne e
pokan-et   na nejzinata zabava.
Wait-3SG.VV self-DAT it-ACC coffee to go-3SG.VN, ITR frowning why not is
invite-M.3SG.VA to her   party.
"Waiting for the coffee to go, he was frowning because he was not invited to her party."

In the example above, we can see the forms of the:

- verbal adjective(VA) that is formed by adding to the aorist stem of the verb, -et in this case in agreement with the male subject of the sentence, in third person singular,

- adverb(VV) which are formed by adding -jkji to the imperfect stem of the verb,

- and the verbal noun(VN), which is formed by adding -nje to the imperfect stem.

There are a lot of further verb particularities and dialectical differences in forms and usage.

2.5   Other morphological particularities

2.5.1   Open and closed word classes

There are eleven word classes in Macedonian.

- Open word class: nouns, adjectives, numerals, pronouns and verbs.

- Closed word class: prepositions, adverbs, conjunctions, particles, interjections and modal words.

The open and closed word class division also mirrors the list of words that can and cannot be inflicted respectively. They can be inflected for tense, voice, person, number, gender, mood, aspect, animacy, definiteness and marginally for case.

2.5.2   Macedonian is and analytic language

Macedonian is an analytic language, mostly fusional. That means that in Macedonian the relationships between words in sentences are primarily conveyed by the way of helper words(particles, prepositions etc.) and word order, as opposed to utilizing inflections(Wikipedia (2020a)). The fusional characteristic means that the language has a tendency to use a single inflectional morpheme to denote multiple grammatical, syntactic or semantic features(Wikipedia (2020a)).

2.6   Morphological processes

In Macedonian, there are the morphological processes of derivation: affixation(mostly suffixation, marginal prefixation), conversion, suppletion and compounding.

3   Semantics

3.1   Semantic groups of verbs

There is no existing literature that describes the semantic groups of verbs in Macedonian. While looking for any references, even individual papers on the topic by contacting experts, I have turned to neighbouring languages that belong to the South Slavic branch of the Slavic languages. By cross-referencing similar categorisation done in Serbian and Croatian, I am able to list some categories and give examples. It is interesting to note that different materials had slightly different categorisations. The Serbian and Croatian papers and analysis will be referenced, but the denotation of the words does not always map exactly.

Following are a few examples each of several semantic categories of verbs as a result of my cross-linguistic analysis. On the left the category is named and after the semicolon follow each of the examples in the following form: original term in Cyrillic/transliteration/English translation of the word. All verbs in Macedonian are in their infinitive form.

- Movement: оди/odi/walk, трча/trča/run, фрла/frla/throw, носи/nosi/carry, плива/pliva/swim, лета/leta/fly, скока/skoka/jump, игра/igra/dance (Vujovič (2019))

- Changing body position: свитка/svitka/bend, исправи/ispravi/straighten

- Placing objects: стави/stavi/put, скрие/skrie/hide, приложи/priloži/place

- Physical hit: удри/udri/hit, боцне/bocne/poke, клоца/kloca/kick, плесне/plesne/slap

- Creating a physical object: шие/šie/sew, крои/kroi/tailor, гради/gradi/build

- Destruction: разнесе/raznese/blow up, изгори/izgori/burn, убоде/ubode/stab, скрши/skrši/smash, запали/zapali/ignite, расипе/rasipe/break

- Change of state or characteristic: расте/raste/grow, збогатува/zbogatuva/get rich, шири/širi/expand, смали/smali/shrink

- Existential sphere: живее/živee/live, умира/umira/die, егзистира/egzistira/exist, суштествува/suštestvuva/exist

- Beginning of existence: настане/nastane/become, роди/rodi/birth, обликува/oblikuva/shape, креира/kreira/create

- Cease of existence: умре/umre/die, убие/ubie/kill, испари/ispari/evaporate, елиминира/eliminira/eliminate, искорени/iskoreni/eradicate

- Placement of body in space: седи/sedi/sit, лежи/leži/lay, стои/stoi/stand

- Contact: допре/dopre/touch, гушне/gušne/hug, наслони/nasloni/lean on, потпре/potpre/prop, поткрепи/potkrepi/support

- Possessive sphere: даде/dade/give, донира/donira/donate, стекне/stekne/accumulate, изгуби/izgubi/lose

- Mental sphere: знае/znae/know, погоди/pogodi/guess, верува/veruva/believe, памети/pameti/remember, калкулира/kalkulira/calculate

- Emotion: љуби/ljubi/love, милува/miluva/pet, бендисува/bendisuva/like, грижи/griži/worry, лути/luti/become angry, мрази/mrazi/hate (Milosavljevič (2017))

- Speech: зборува/zboruva/speak, советува/sovetuva/advise, расправа/rasprava/argue

- Perception: види/vidi/see, гледа/gleda/watch, погледне/pogledne/look, слуша/sluša/listen, чуе/čue/hear, чувствува/čuvstvuva/feel, вкуси/vkusi/taste, мириса/mirisa/smell

- Physiological sphere: кашла/kašla/cough, ика/ika/hiccup

- Natural phenomenon: врне/vrne/rain, грми/grmi/thunder, заоблачува/zaoblačuva/get cloudy

- Sound: шушти/šušti/hiss, пишти/pišti/scream, квичи/kviči/squeak, мјаука/mjauka/meow, мука/muka/moo

- Light: изгасне/izgasne/extinguish, сјае/sjae/glow, свети/sveti/shine, блеска/bleska/sparkle

I also borrowed some thinking from the work of Russian scholars like 'Russian Semantic Dictionary' (Svedova (2000)), and various blogs in Russian, Serbian and Croatian.

3.2 NLP resources in Macedonian

3.2.1 NLP libraries and similar work

Unfortunately, not many NLP resources are available in Macedonian. One place to look for resources in the ACL website, which returns 415 results. Upon careful inspection of those resources, the overwhelming majority are either inspecting Macedonian as an example of an under-resourced language, or in relation to Bulgarian in language identification or other operations on closely related languages. In a further part of the papers listed there, Macedonian

is only mentioned and not directly examined. However, a few resources were available there and are listed among the ones that I have found elsewhere.

nlmk (Petrushev (2013)) - a small open source natural language processing library for Macedonian. The goal of the library is to provide similar support like nltk does for English.

MAKEDONKA (Mishev et al. (2020)) - applied deep learning model for text-to-speech synthesis in Macedonian language.

MULTEXT-East (Erjavec (2017)) - multilingual text tools and corpora for Central and Eastern European languages. It contains annotated corpora and morphosyntactic resources. Macedonian is featured, although with less resources than the other languages. One of the best parts of this resource is the "MULTEXT-East "1984"annotated corpus which is, from my research, the only such resource available in Macedonian online.

ELITR (Bojar (2020)) - a live translator financed by the European Union to improve the communication between the citizens in Europe. It features Macedonian as well.

The ongoing creation of NLP resources is mentioned in the "Development of the First LRs for Macedonian: Current Projects"paper (Ivanovska-Naskova (2006)). Most of them are not accessible online. Nevertheless, it seems like there is a lot of movement that is happening within the academic circles.

There are also a few examples that students have documented in the form of papers when it comes to sentiment analysis and opinion mining, although leaving now code behind.

3.2.2   WordNet and FrameNet

There are no similar resources to WordNet and FrameNet. As creating such resources requires tremendous effort and considerable funding, a graduate has attempted to write their thesis (Saveski and Trajkovski (2010)) on the automation of this process, thus possibly divorcing it from such immense investment. Other than this thesis, there are no other information available on this topic.

4   Syntax

4.1   Word order

The default argument order in Macedonian is subject-verb-object (SVO). However, the word order is flexible and can be topicalised(Friedman (2001)). The topicalisation can also be achieved with a combination of intonation and word order.

These are five examples to say the exactly same thing. We can notice that the words move around. The focus shifts between the object and the subject, and in the later two sentences between the object + the verb and the subject + the verb. When these utterances are spoken, the intonation changes as well to stress the focus.

Мајката   го   пази   детето.
Majka-ta   go   pazi   dete-to.
Mother-DEF it-ACC watching over child-DEF.
"The mother is watching over the child"

Детето   мајката   го   пази.
Dete-to   majka-ta   go   pazi.

Child-DEF mother-DEF it-ACC watching over.
"The mother is watching over the child"

Мајката	детето	го	пази.
Majka-ta	dete-to	go	pazi.

Mother-DEF child-DEF it-ACC watching over.
"The mother is watching over the child"

Го	пази	детето	мајката.
Go	pazi	dete-to	majka-ta.

It-ACC watching over child-DEF mother-DEF.
"The mother is watching over the child"

Го	пази	мајката	детето.
Go	pazi	majka-ta	dete-to.

It-ACC watching over mother-DEF child-DEF.
"The mother is watching over the child"

4.2   Other interesting syntax particularities

4.2.1   Null-subject language

In null-subject languages, the subject pronoun can be omitted. This is the case in Macedonian too.

Пишувам	книга.
Pišuv-am	kniga.
Writing-1.SG	book.

"I am writing a book."

4.2.2   Passive construction

The passive is formed either with 'se' or with 'to be' plus verbal adjective(Friedman (2001)).

Не	треба	да	се	вреви.
Ne	treba	da	se	vrevi.
Not	should	to	ITR	make noise.

"One shouldn't make noise."

In the example above, we see the usage of 'se' to form the passive sentence. It seems a bit unclear from the gloss, but the verb 'vrevi' means 'make noise'.

Таа	беше	разбудена	од	времето.
Taa	beše	razbudena	od	vreva-ta.
She	was	awoken	by	noise-DEF.

"She was awoken by the noise."

In this second example, we have the verb 'to be' paired with the verbal adjective 'razbudena', which means 'awakened'. In this type of a passive construction, the agent is usually expressed with the preposition 'od', meaning 'from, of, by'.

4.2.3   Prepositions to express case

As mentioned in the section Case, Macedonian together with Bulgarian are the only languages that have lost the elaborate case system of the other Slavic languages.

To express relationship between words in a sentence, Macedonian makes good use of prepositions.

The preposition 'na' can have the local and motional meanings 'on, too, at', but it also marks the indirect object(dative) and possession(genitive). It is the most prominent with this usage. There is also 'od' with the original meaning 'from' that can also mark possesion and 'agentive by' in passives. 'So', with the original meaning 'with' can mark an instrumental 'by' as well (Friedman (2001)). An example gloss below.

Ѕидот   бил   ишкртан   со молив од дургарот на момчето.
Dzid-ot   bil   iškrtan   so moliv od drugar-ot na momče-to.
Wall-DEF was-LF.M scribbled-VA.M with pencil from friend-DEF to boy-DEF.
"The wall was scribbled on with a pencil by the friend of the boy."

4.3   The Universal Dependencies project

Macedonian is not yet a part of the Universal Dependencies project, although it is listed as an upcoming language.

4.4   Trained parser for the language

CST's lemmatizer (Jongejan (2014)) is supporting Macedonian. The NLMK(Petrushev (2013)) library mentioned above can also parse.

5   Discourse

5.1   Resources for discourse analysis

There are no available resources for discourse analysis in Macedonian.

5.2   Coherence relations

In Macedonian coherence relations can be encoded both explicitly and implicitly. Here is an example where we can perceive both.

Тој   задоцни.   Како последица, беше   отпуштен.
Toj   zadocni.   Kako posledica, beše   otpušten.
He-3SG.M late-PST.3SG. As   consequence, was-PST.3SG fired.
"He was late. As a consequence, he was fired."

Тој   задоцни.   Беше   отпуштен.
Toj   zadocni.   Beše   otpušten.
He-3SG.M late-PST.3SG. Was-PST.3SG fired. "He was late. He was fired."

5.3   Discourse connectives

It has been a great challenge to research discourse in Macedonian, including the topic of discourse connectives. I had to largely lean on my intuition as a native speaker on this one.

To help answering this questions, I analysed some texts. Adverbs often appeared as discourse connectives. (Friedman (2001)) gives a comprehensive list of adverbs in the book, and they are all very set in their meaning. I could not detect polysemy, but it is possible that there is more subtlety that I am missing.

However, there are the discourse connectives 'a' and 'i' that are equal to the English 'and'.

In the 'Discourse Connective AND and its Macedonian Equivalents A and И' article (Nehskovska (2015)), the different pragmatic functions of 'a' and 'i' are discussed. They could be used to continue an argument that was threatened by an interruption, as fillers, adding additional details to statements and emphasising them, adding them to the end of statement in search of validation or as a way to ask an opinion, at the beginning of a sentence to encourage someone to share their opinion etc. That being said, I am not clear if a word having multiple pragmatic functions qualifies as polysemous.

5.4 Pragmatic phenomena

If we look beyond the basic pragmatic phenomena like deixis, referring expressions, entailment, presuppositions etc. and enter the realm of pragmatic phenomena that are very intertwined with the social and cultural like code-switching, we can find several in of pragmatic phenomena appearing in Macedonian. There is no existing literature in Macedonian, so I used some information from the "Pragmatics"(Yule (1996)) book.

Some examples discussion in the following subsections. Of course, there are many more.

5.4.1 Language politeness

Language politeness has it's own language markings. Politeness and respect are expressed through using the second person plural form. (Friedman (2001)) notes this as a recent phenomenon in the language so the agreement of the adjectives varies from singular to plural. The plural version is often heard. This kind of language is used by younger people speaking to older people, in the professional environment, at school/university and at institutions. Sometimes, mastering and using language politeness can signify social class.

Вие   сте   изморен/изморена/изморени
Vie   ste   izmoren/izmorena/izmoreni
You-2PL are-2PL M.SG/F.SG/PL.
'You are tired'

5.4.2 Phatic expressions

Phatic expressions are present and common in Macedonian. Here is a little dialog example.

- Како си?
This is the equivalent of the English 'How are you?', bearing the same meaning as a conversation starter and rarely asking for a detailed sincere answer.

- Добро, вие како сте?
'Well, how are you?' - The 'you' in this case is plural, as it is very common to ask about the family and not just the one person when you meet them.

- Добро, фала Богу. Како работата?
'Well, thank God. How is work?' - The phrase 'thank God' is very ingrained in the language, and has Christian roots. Once an expression of worship, it is now used as a phatic expression. 'How is work' is also a conversation companion. The answer to that is not meant to be anything specific.

- Си врви, си врви. Горе-доле, ама шо ќе праиш.
'It goes, it goes. Ups and downs, but what can you do.' - The phatic expression си врви gives

no positive or negative connotation, just expresses status quo. The next sentence has the phatic expression, 'шо ќе праиш', which is a complaint and a resignation at the same time. It is another status quo marker, but it also has the intention of building connection and empathy.

- Еми шо ќе праиш. Ќе биде.
'But what can you do. It will be better' - The phatic expression 'ќе биде' if literally translated it means 'it will happen'. It is a general encouraging and hopeful statement, a more of an exchanged good wish.

- Ќе биде. Ајде поздрави дома многу па да се видиме.
'It will be better. Many greetings to everyone at home and hope to see you.' - The phatic expression 'па да се видиме' could mean a real intention for a future meeting, but it is often times used to close a conversation with someone you know and meet occasionally for a brief moment somewhere, but you have no real intention of calling or meeting specifically.

- Ајде, обавезно!
'Surely!' - In this case, 'обавезно' is also a phatic expression that is expected on the other side to close the conversation.

5.4.3   Code-switching

Code-switching is a very interesting phenomena.

The are many Macedonian dialects and some of them differentiating quite a bit from the standard Macedonian, that is more or less only learned in schools. It is however, a sign of education and status. A lot of people code-switch talking to their families/friends and communities and using standard Macedonian in environments where that is expected.

I first noticed that I myself code-switch a lot during my political activism days. I would have to often unexpectedly give public statements on TV or just answer journalist questions on the phone. Being 21, that would mean switching from a youthful slang with my friends, to a politically measured standard language presentation in an instance, and then back. This was also very noticeable as I traversed the different communities we advocated for - certain communities would be very put off by my standard, terminology filled language. So I also learned to adapt and switch whenever needed. It is definitely common between politicians and politically active people, as well as people traversing class, ethnic backgrounds and even gender.

Macedonia has also two official languages and is historically a melting pot of that sort. The language itself has many influences that are now ingrained, but it is also very normal that people code-switch while speaking to different people and mixing the languages.

References

Ondřej Bojar. 2020. ELITR - European Live Translator. Charles University, Prague. https://elitr.eu/

Tomaž Erjavec. 2017. MULTEXT-East. (Nancy Ide, James Pustejovsky, eds.): Handbook of linguistic annotation (2017), 441–462. https://doi.org/10.1007/978-94-024-0881-2_17

Victor Friedman. 2001. Macedonian Reference Grammar. SEELRC, http://www.seelrc.org:8080/grammar/mainframe.jsp?nLanguageID=3.

Ruska Ivanovska-Naskova. 2006. Development of the First LRs for Macedonian: Current Projects. In Proceedings of the Fifth International Conference on Language Resources and

Evaluation (LREC'06). European Language Resources Association (ELRA), Genoa, Italy. http://www.lrec-conf.org/proceedings/lrec2006/pdf/68_pdf.pdf

Bart Jongejan. 2014. CST's lemmatizer. http://hdl.handle.net/11372/LRT-1249 LINDAT/CLARIAH-CZ digital library at the Institute of Formal and Applied Linguistics (ÚFAL), Faculty of Mathematics and Physics, Charles University.

Tanja Z. Milosavljevič. 2017. Leksičko semantičke grupe glagola emocionalnih odnosa i glagola ekteriorizacije emocija u srpskom prizrenskom govoru. (Serbian) [Lexical-semantic groups of verbs for emotional relationships and verbs for expressing emotions in the Serbian-Prizren speech]. Ниш : Филозофски факултет, https://dais.sanu.ac.rs/handle/123456789/6311?show=full.

Kostadin Mishev, Aleksandra Karovska Ristoska, Dimitar Trajanov, Tome Eftimov, and Monika Simjanoska. 2020. MAKEDONKA: Applied Deep Learning Model for Text-to-Speech Synthesis in Macedonian Language. Applied Sciences 10, 6882 (2020), 14. https://doi.org/10.3390/app10196882

Silvana Nehskovska. 2015. Discourse Connective AND and its Macedonian Equivalents A and И. HORIZONS INTERNATIONAL SCIENTIFIC JOURNAL Series A Social Sciences and Humanities (2015), 199–208. http://eprints.uklo.edu.mk/id/eprint/5685

Baže Petrushev. 2013. Natural Language processing library for Macedonian (MK). https://github.com/petrushev/nlmk

Martin Saveski and Igor Trajkovski. 2010. Automatic Construction of Wordnets by Using Machine Translation and Language Modeling. (2010), 6. https://web.media.mit.edu/~msaveski/assets/publications/2010_wordnet_construction/paper.pdf

Natalia Svedova. 1998 and 2000. Русский семантический словарь. (Russian) [Russian semantic dictionary]. Российская академия наук. Ин-т рус. яз. им. В. В. Виноградова, http://www.slovari.ru/default.aspx?s=0&p=235.

Dušanka Vujovič. 2019. Glagoli ljudskog kretanja u savremenom srpskom jeziku. (Serbian) [Human movement verbs in contemporary Serbian]. Filozofski Fakultet Novi Sad, http://digitalna.ff.uns.ac.rs/sites/default/files/db/books/978-86-6065-562-4.pdf.

Wikipedia. 2020a. Macedonian grammar. Wikimedia. https://en.wikipedia.org/wiki/Macedonian_grammar

Wikipedia. 2020b. Macedonian language. Wikimedia. https://en.wikipedia.org/wiki/Macedonian_language

George Yule. 1996. Pragmatics. Oxford University Press, https://books.google.de/books?id=E2SA8ao0yMAC.