

ADVERBS DERIVED FROM ADJECTIVAL PRESENT PARTICIPLES IN POLISH, SLOVAK AND CZECH: A COMPARATIVE CORPUS-BASED STUDY

AKSANA SCHILLOVÁ

Czech Language Institute, Czech Academy of Sciences, Prague, Czech Republic

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Abstract: The paper investigates and compares the inventory of adverbs derived from adjectival present participles in the Polish, Slovak and Czech languages. The particularity of these adverbs is that they do not occur in every language, even if it concerns closely related languages. While in Polish and Slovak this type of adverbs is represented by hundreds of lemmas, in Czech it is almost not represented. The comparative analysis is carried out on the data retrieved from the comparable web corpora Aranea. The sets of adverbs extracted from the comparable corpora of the languages examined are analysed by the following criteria: the total number of the adverb lemmas in the corpus, their relative frequency (ipm), morphemic structure features, collocability preferences. The similarities and differences between the adverb sets are established. According to the corpus data, the adverbs derived from adjectival present participles are more widely used in Polish than in Slovak, and in Czech they are a rare phenomenon represented by a limited number of lemmas with a negligible frequency.

Keywords: adverb, adjectival present participle, word-formation, comparable corpora, Aranea

1 INTRODUCTION

The paper focuses on one word-formation type of adverbs which is found in Polish and Slovak (in some other languages as well),¹ but is almost not found in Czech, namely, on adverbs derived from adjectival present participles. From the formal point of view, adverbs with verbal origin ending in *-qco* in Polish and *-úco/-aco* in Slovak are investigated, mainly in the context of restrictions in the formation of similar adverbs in Czech, even though these languages are closely related to each other.

The study is inspired by new publications based on parallel corpora and devoted to the topics of lexical gaps (Perišić 2020), language-specific words (Shmelev 2020), or non-equivalent constructions (Ďurčo – Braxatorisová 2022), viewed from an interlingual perspective.

¹ For example, in Russian (Shmeleva 2016) or English (Killie 2022).

The present comparative study is based on comparable corpora and have the following purposes: a) to extract from the corpora, analyse and compare the sets of Polish, Slovak and Czech adverbs of the type under discussion, b) to establish similarities and differences between these adverb sets, c) based on the data provided by the corpora, to evaluate the usage of this type of adverbs in the languages compared.

2 THEORETICAL BACKGROUND

2.1 Adverbs derived from adjectival present participles in Polish and Slovak

According to Kisiel (2018, p. 193), the adverbs derived from adjectival present participles have not received much attention by Polish language researchers. In (Kisiel 2018), the adverbs ending in *-qco* are distinguished and discussed due to the function of some of them as the so-called “metapredicative operators” (see also Danielewiczowa 2012; Grochowski 2018), or alternatively due to the undergoing process of the metatextualization of these adverbs, which may be presented as follows: verb → participle → adjective → adverb → metapredicative operator. Moreover, the ability to derive an adverb is considered as a criterion for the adjectivization of a corresponding participle (*ibidem*).

As regards the Slovak language, the adverbs of the type examined in this paper are also not sufficiently investigated. In the new Slovak word-formation dictionary (Ološtiak et al. 2021), the adverbs ending in *-úco/-aco* are not distinguished within the transpositional type of deadjectival qualitative adverbs ending in *-o* and are exemplified by one lemma (*ibidem*, p. 406). In the authoritative Morphology of the Slovak Language (Dvonč et al. 1966), the above adverbs are presented as qualitative adverbs derived from adjectival present participles and are exemplified by 28 lemmas (*ibidem*, p. 580–581). In other grammars, these adverbs are only mentioned and represented by single examples.

In the present paper, it is assumed that the adverbs derived from adjectival present participles are worth special attention, already for the reason that they are not forming in every language, even if it concerns closely related languages.

2.2 Adverbs derived from adjectival present participles as impossible words in Czech

In the Czech linguistic literature, the impossibility of forming adverbs from adjectival present participles² ending in *-cí* is either briefly mentioned as a fact (e.g. Štícha et al. 2018, p. 1080), or additionally commented on with the remark that in

² In the Czech linguistic tradition, the lexical items ending in *-cí*, that are considered here as (adjectival) present participles, are classified as deverbal adjectives, see the review of different national linguistic interpretations of these words by Kocková (2022, p. 29f.).

Czech there are very few adverbs which can be considered as formed from the adjectival present participles, namely by expanding a base stem by *-n-*, such as *vroucí* ‘boiling’ – *vroucně* ‘fervidly’ (Komárek 2006, p. 41; Knappová 1973, p. 16; Stich 1969, p. 63).

In older papers, the forming adverbs according to this model was sharply criticized as incorrect, see, e.g. on the adverb *obdivujícně* ‘admiringly’ by Zubatý (1920, p. 274). Cf. Grepl and Karlík (1995, p. 219) regard adverbs such as *vyhovujícně* ‘suitably’ as non-literary.

Nevertheless, these adverbs are sporadically formed by Czech native speakers. So, the database of excerpt material named Neomat,³ that is storing new Czech lexical items from the 1990s to the present, currently lists more than ten lemmas of adverbs of the above type.

3 DATA AND METHODOLOGY

In the present study, the comparable web corpora Aranea (Benko 2014)⁴ are used to collect and compare data about the use of adverbs examined in Polish, Slovak and Czech. These are the following corpora:

Araneum Polonicum Minus (Polish, 15.02) 119 M,

Araneum Slovacum VI Minus Beta (Slovak, 22.01) 125 M,

Araneum Bohemicum IV Minus (Czech, 20.03) 125 M.

The data from the corpora are collected by using the following steps (exemplified by the Polish language):

1) with the CQL query [atag="Av"&word=".*ąco"] a concordance where the adverbs ending in *-ąco* appear is retrieved from the Polish corpus;

2) using the option Frequency (Make frequency list) a frequency list of the adverbs is made;

3) the set of the adverbs presented in the frequency list is thereafter analysed by the following criteria: a total number of the adverb lemmas in the corpus, their relative frequency (ipm), morphemic structure features, collocability preferences.

The Slovak and Czech language data are collected based on the same methodology.

The analysis of the data is supported by online lexicographic resources of the respective languages, such as the Polish Academy of Sciences Great Dictionary of Polish (<https://wsjp.pl/>), the Dictionary portal of the Ľ. Štúr Institute of Linguistics of the Slovak Academy of Sciences (<https://slovníky.juls.savba.sk/>), the DEBDict General Dictionary Browser that offers direct access to various Czech dictionaries (<https://deb.fi.muni.cz/>).

³ <https://neologismy.cz>

⁴ <http://unesco.uniba.sk/>.

4 RESULTS

4.1 The Polish and Slovak adverbs derived from adjectival present participles, according to the data from the 100-million-word Aranea corpora

The adverb frequency lists extracted from the minus versions of the Araneum Polonicum and Araneum Slovaccum corpora (of about 100M words) contain the following number of items: the Polish adverbs ending in *-ąco*, 478; the Slovak adverbs ending in *-úco*, 304.

The Polish and Slovak adverbs ending in *-ąco* and *-úco*, respectively, do not have homonyms in other word classes, therefore, these lists really consist only of the adverbs of this type that occur in the corpora. In this case, the probability of incorrect disambiguation is minimal. Nevertheless, the output number of lemmas in the frequency lists is negligibly distorted because it includes some duplicate lemmas with typos or spelling errors.

In the subsequent quantitative analysis, the presence of misspellings in the lists is ignored. All percentages presented below are rounded to the nearest integer. As illustrated, direct equivalents from the adverbs lists extracted from the corpora are provided.

4.1.1 Similarities

The Polish and Slovak sets of the adverbs investigated have the following common features:

1) Both sets consist of the adverbs with either native or foreign roots, moreover the ratio of these roots in both sets is the same, see Tab. 1.

Root origin	Polish adverbs			Slovak adverbs		
	Number of lemmas	Share in the set, %	Example	Number of lemmas	Share in the set, %	Example
native	379	79	<i>odstraszaąco</i> 'frighteningly'	240	79	<i>odstrašujúco</i> 'frighteningly'
foreign	99	21	<i>inspirująco</i> 'inspiringly'	64	21	<i>inšpirujúco</i> 'inspiringly'

Tab. 1. The ratio between native and foreign roots in the adverb sets

2) Both sets include adverbs with negation prefixes, which are moreover directly equivalent to each other, see Tab. 2.

Negation prefixes	Polish adverbs			Slovak adverbs		
	Number of lemmas	Share in the set, %	Example	Number of lemmas	Share in the set, %	Example
Pol. <i>nie-</i> , Slov. <i>ne-</i> 'non'	27	6	<i>niewystarczająco</i> 'insufficiently'	14	7	<i>nedostačujúco</i> 'insufficiently'
Pol. <i>znie-</i> , Slov. <i>zne-</i> 'dis'	3		<i>zniechęcająco</i> 'discouragingly'	7		<i>znehucujúco</i> 'discouragingly'

Tab. 2. Adverbs with negation prefixes in the adverb sets

3) Both sets include adverbs with compound stems, see Tab. 3.

Stem type	Polish adverbs			Slovak adverbs		
	Number of lemmas	Share in the set, %	Example	Number of lemmas	Share in the set, %	Example
Compound stem	9	2	<i>lekceważąco</i> ‘disparagingly’	16	5	<i>srdcervúco</i> ‘heartbreakingly’

Tab. 3. Adverbs with compound stems in the adverb sets

4) The adverbs in both sets have a similar collocability as well as collocates (verbal, adjectival, or adverbial) that are mostly equivalent, see Tab. 4, Tab. 5. The most frequent verbal collocate of these adverbs is the verb with the meaning ‘to act’, namely Polish *działać*, Slovak *pôsobit’*. This corresponds to their initial function as adverbs of manner. Further, approximately one-third of both Polish and Slovak adverbs examined is used to modify adjectives.

Top verbal collocates		Number of adverb lemmas collocated	Share in the adverb set, %	Examples
Polish	<i>działać</i> ‘to act’	181	39	<i>(działać) kojąco, pobudzająco, uspokajająco</i> ‘(to act) soothingly, encouragingly, calmingly’
	<i>wyglądać</i> ‘to look’	66	14	<i>(wyglądać) imponująco, olśniewająco, interesująco</i> ‘(to look) impressively, dazzlingly, attractively’
	<i>brzmieć</i> ‘to sound’	44	9	<i>(brzmieć) zachęcająco, interesująco, kusząco</i> ‘(to sound) friendly, attractively, temptingly’
Slovak	<i>pôsobit’</i> ‘to act’	127	42	<i>(pôsobit’) upokojujúco, osviežujúco, povzbudzujúco</i> ‘(to act) calmingly, refreshingly, encouragingly’
	<i>vyzerat’</i> ‘to look’	25	8	<i>(vyzerat’) vynikajúco, očarujúco, ohromujúco</i> ‘(to look) great, charmingly, stunningly’
	<i>zniet’</i> ‘to sound’	22	7	<i>(zniet’) prekvapujúco, odstrašujúco, šokujúco</i> ‘(to sound) surprisingly, frighteningly, shockingly’

Tab. 4. Top verbal collocates (position: -5 to +5) of the adverbs

Top adjectival and adverbial collocates		Number of adverb lemmas collocated	Share in the adverb set, %	Examples
Polish	Adjectives such as <i>niski</i> ‘low’, <i>wysoki</i> ‘high’, <i>dobry</i> ‘good’, <i>duży</i> ‘big’, <i>piękny</i> ‘nice’	122	26	<i>Potrzebną wiedzę możesz zdobyć po zaskakująco niskich cenach.</i> ‘You can get the knowledge you need at surprisingly low prices.’
	Adverbs such as <i>dobrze</i> ‘well’, <i>szybko</i> ‘quickly’	64	14	<i>Satysfakcjonująca praca sprawia, że zadziwiająco dobrze się trzymają.</i> ‘A satisfying job makes them hold up surprisingly well.’

Top adjectival and adverbial collocates		Number of adverb lemmas collocated	Share in the adverb set, %	Examples
Slovak	Adjectives such as <i>vysoký</i> 'high', <i>nizky</i> 'low', <i>dobry</i> 'good', <i>velky</i> 'big', <i>krasny</i> 'nice'	87	29	<i>Kvalitné laminátové podlahy sú vynikajúco odolné tak proti vode ako aj opotrebeniu.</i> 'High-quality laminate floors are excellently resistant to both water and wear.'
	Adverbs such as <i>dobre</i> 'well', <i>rychlo</i> 'quickly'	17	6	<i>Medviedatá prekvapujúco dobre šplhajú.</i> 'Bear cubs climb surprisingly well.'

Tab. 5. Top adjectival and adverbial collocates (position: +1) of the adverbs

4.1.2 Differences

Although the sets of the Polish and Slovak adverbs show many similarities, there are also important differences between them.

1) The Polish adverb set includes several lemmas with a high frequency, compared to the frequency of the other lemmas in the set. There are no such high-frequency lemmas in the Slovak set, moreover, in general, the Slovak adverbs of the type discussed have a lower frequency than the respective Polish adverbs, see Tab. 6.

Rank	Polish adverbs		Slovak adverbs	
	Item	ipm	Item	ipm
1	<i>gorąco</i> ⁵ 'hot' or 'fervidly'	3413 ⁶	<i>vynikajúco</i> 'excellently'	6.94
2	<i>bieżąco</i> 'constantly'	31.10 ⁷	<i>prekvapujúco</i> 'surprisingly'	4.70
3	<i>znacząco</i> 'significantly'	19.56	<i>horúco</i> ⁸ 'hot' or 'fervidly'	2.86
4	<i>wystarczająco</i> 'enough'	18.60	<i>upokojująco</i> 'soothingly'	1.15
5	<i>następująco</i> 'as follows'	8.62	<i>šokujúco</i> 'shokingly'	0.97
...	all the other adverbs in the set	from 5 to 0.01	all the other adverbs in the set	from 0.40 to 0.01

Tab. 6. The most frequent Polish and Slovak adverbs derived from adjectival present participles, according to the comparable corpora

⁵ The Polish lemma *gorąco* is used as an adverb of manner as well as predicative adverb and noun, see <https://wsjp.pl/>.

⁶ Including occurrences as a part of the compound adverb *na gorąco* '(serve food) hot' or '(decide) immediately', ipm 2.52.

⁷ Including occurrences as a part of the compound adverb *na bieżąco* 'constantly', ipm 30.37.

⁸ The Slovak lemma *horúco* is used as adverb of manner as well as predicative adverb, see <https://slovníky.juls.savba.sk/>.

2) The Polish adverb set includes several lemmas which are mainly used as a part of the compound adverb of the type *na* + adverb ending in *-qco*,⁹ see Tab. 7. Similar adverbs do not occur in the Slovak set.

Item	ipm	Share in the total number of the adverb occurrences, %
<i>na bieżąco</i> 'constantly'	30.37	98
<i>na stojąco</i> 'in a standing position'	1.91	97
<i>na siedząco</i> 'in a sitting position'	0.59	92
<i>na leżąco</i> 'in a lying position'	0.50	97
<i>na klęcząco</i> 'in a kneeling position'	0.08	91

Tab. 7. Polish compound adverbs of the type *na* + adverb ending in *-qco*

3) The Polish set includes more pairs/groups of adverbs with the same roots, as contrasted with the Slovak set, see Tab. 8.

	The Polish set	The Slovak set
Number of pairs/groups of cognate adverbs	55	20
Share in the adverb set, %	12	7
Examples	<i>lśniąco</i> 'glisteningly', <i>ośniewająco</i> 'dazzlingly'; <i>oczyszczająco</i> , <i>przeczyszczająco</i> , <i>czyszcząco</i> 'in a cleansing manner'; <i>ochładzająco</i> , <i>schładzająco</i> , <i>wychładzająco</i> , <i>chłodząco</i> 'coolingly'	<i>očisťujúco</i> , <i>prečisťujúco</i> 'in a cleansing manner'; <i>vysvetľujúco</i> 'explainingly', <i>samovysvetľujúco</i> 'self-explainingly', <i>zosvetľujúco</i> 'in a brightening manner'

Tab. 8. Cognate adverbs in the Polish and Slovak adverb sets

4.1.3 Slovak adverbs ending in *-aco*

As for as the Slovak adverbs ending in *-aco*, only 8 relevant but low-frequency lemmas are found in the Slovak corpus. These are the following:

neveriaco 'unbelievably', 0.24 per million;

tesniaco 'sealingly', *tlmiaco* 'in a dampening manner', *brzdiaco* 'as a brake', 0.02 per million;

páliaco 'stingingly', *ničnehovoriaco* 'unintelligibly', *lahodiaco* 'pleasingly', *hodnotiaco* 'appraisingly', 0.01 per million.

All the above adverbs have their origin in verbs of the pattern *robiť* 'to do' – *robím* 'I do' (Dvonč et al. 1966, p. 455). Due to the fact that in a 100-million-word corpus these

⁹ The semantics of these adverbs was examined in the case study by Kościerzyńska (2011).

adverbs are presented by only a few lemmas with an insignificant frequency, while in the same corpus the mentioned verb pattern is presented by more than 30,000 lemmas¹⁰ and the respective present participles are presented by about 1,500 lemmas,¹¹ it can be concluded that the Slovak adverbs ending in *-aco* are on the periphery of the adverb word-formation type under examination.

4.2 The Czech adverbs with verbal origin ending in *-cně*, according to the data from the 100-million-word Araneum Bohemicum corpus

In the Czech corpus, a total of 41 relevant adverbs are found. These are low frequency lemmas, most of which (34 lemmas, i.e., 83% of the set) have from 4 occurrences to 1 occurrence in the 100-million-word corpus (ipm=0.03–0.01). Nevertheless, several of these adverbs, including 7 lemmas with ipm > 0.03, are found in the Czech dictionaries (see the DEBDict portal mentioned above), such as presented in Tab. 9.

Item	ipm
<i>nevěřicně</i> ‘unbelievably’	3.23
<i>vroucně</i> ‘fervidly’	0.56
<i>nebojácně</i> ‘fearlessly’	0.44
<i>kajícně</i> ‘contritely’	0.25
<i>bojácně</i> ‘fearfully’	0.19
<i>horoucně</i> ‘fervidly’	0.10
<i>vědoucně</i> ‘knowingly’	0.06
<i>budoucně</i> ‘in the future’, <i>přejícně</i> ‘kindly’, <i>srdcervoucně</i> ‘heartbreakingly’, <i>nežádoucně</i> ‘undesirably’, <i>vševědoucně</i> ‘omnisciently’	0.02
<i>žádoucně</i> ‘desirably’, <i>živoucně</i> ‘livingly’, <i>nepřejícně</i> ‘unkindly’, <i>nemohoucně</i> ‘powerlessly’	0.01

Tab. 9. The Czech adverbs ending in *-cně* extracted from the corpus which are represented in dictionaries

Some of the adverbs extracted from the corpus are already registered in the Neomat database, such as:

vynikajícně ‘excellently’, 0.03 per million;
 matoucně ‘confusingly’, *ucházejícně* ‘acceptably’, *zarážejícně* ‘surprisingly’,
 zneklidňujícně ‘worryingly’, *dechberoucně* ‘breathtakingly’, 0.01 per million.

¹⁰ See Araneum Slovacum VI Minus Beta (Slovak, 22.01) 125 M, CQL query: [atag="Vb"&lemma=".*it"], lemma frequency list.

¹¹ See Araneum Slovacum VI Minus Beta (Slovak, 22.01) 125 M, CQL query: [lemma=".*iaci"], lemma frequency list.

All the other adverbs (19 lemmas, i.e., 46% of the set) that appear only in the corpus are formed according to the same pattern, such as *zavádějící* ‘misleading’ – *zavádějícíně* ‘misleadingly’, 0.03 per million.

If these adverbs are considered as a whole, that is, as a set of adverbs representing a certain word-formation type, then it can be noticed that there are many similarities between the Czech set and the sets of the Polish and Slovak adverbs discussed above, see Tab. 10 (compare with Tab. 1, 2, 3, and 8). However, the Czech set has a small representation of lemmas most of which are felt by native speakers as deviant.

Attribute		Presence of the attribute	Example
Root origin	native	+	<i>ponižujícně</i> ‘humiliatingly’
	foreign	+	<i>šokujícně</i> ‘shockingly’
Negation prefixes	<i>ne-</i> ‘non’	+	<i>neutichajícně</i> ‘unremittingly’
	<i>zne-</i> ‘dis’	+	<i>znehucujícně</i> ‘discouragingly’
Compound stem		+	<i>všeřikajícně</i> ‘tellingly’
Cognate adverbs in the set		+	<i>vědouně</i> ‘knowingly’, <i>vševědouně</i> ‘omnisciently’

Tab. 10. Attributes that the Czech adverb set shares with the Polish and Slovak adverb sets

5 CONCLUSION

Thus, the data from the comparable corpora show that the adverbs derived from adjectival present participles have a wider usage in the Polish language, as compared to the Slovak language, especially because a) they are represented by a larger number of lemmas that in general have a higher frequency in the comparable corpus than the respective Slovak adverbs; b) several of the Polish adverbs have undergone the processes of lexicalization (high-frequency lemmas), grammaticalization (multi-word adverbs *na* + adverb ending in *-qco*) as well as metatextualization which has already been given special attention in the Polish linguistic literature (see Section 2.1). The Czech adverbs that can be considered as formed from adjectival present participles occur as a rare phenomenon in the corpus, although they as a whole share main formal similarity with the Polish and Slovak adverbs.

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