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Caucasian Influence on Indo-Iranian Ergativity? A Diachronic Typological Evaluation

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Abstract: One of the most important morphosyntactic alignment patterns in human languages is the ergative-absolutive, but researchers have argued that it is a cross-linguistically dispreferred pattern. This alignment pattern, nonetheless, exists in many languages of the Caucasus as well as the Indo-Iranian branch of the Indo-European family, extending from the Caucasus to India. Since ergativity is not a feature of the other branches of the Indo-European family and it is apparently a dispreferred structure, this paper investigates if Indo-Iranian developed its ergative structures under the influence of the languages of the Caucasus. On examining various historical, linguistic and typological evidence, this investigation concludes that ergativity emerged in Indo-Iranian through typologically unmarked processes independent of the influence of the languages of the Caucasus.

Keywords: Language Typology, Morpho-syntactic Alignment, Ergativity, Indo-Iranian Languages, Caucasian Languages, Diachrony

Introduction

One of the central themes in the study of human language typology is "morpho-syntactic alignment". The ergative-absolutive alignment is one of its relatively common types, but it has been argued in the literature that it is cross-linguistically dispreferred with respect to other types like neutral and nominative-accusative alignment. Interestingly, ergative languages seem to cluster areally. Bickel et al. (2015, 2, 18) considered such clusters in the Pacific and South America, and offered language contact as a possible explanation for them. Another cluster of ergative languages involves many past and present languages over a wide area from the Caucasus through the Iranian plateau up to Central India. This situation naturally asks for an explanation: why is ergativity common in this region? Language contact is certainly a possible factor, as in the case of the similar afore-mentioned clusters. In this paper, we take a closer look at a subset of the languages involved to critically evaluate this possibility.

Tuite (1999, 23) argued that for the three indigenous Caucasian families, i.e. Northwest Caucasian (also called Abkhaz-Adyghean), Northeast Caucasian (also called Nakh-Daghestanian) and South Caucasian (also called Kartvelian), a common origin by contact cannot be supported for the respective ergative structures due to the lack of non-trivial similarities in morpho-syntax of these families. The other main family showing ergativity in this region is Indo-Iranian (Windfuhr 2009, 32–33; Verbeke 2013, 249). This is the family that

we will focus on in this paper. We take Moravcsik's (2013, 247) citation of John Haiman, "Everything is what it is because it got that way", as the overarching principle in this investigation. We look into the diachrony of ergativity in these languages and contextualize it on the background of language typology as well as the historio-geography of their speakers to answer the following questions:

1) Through which language-internal processes did ergativity originate and spread in the Indo-Iranian languages?
2) Did their contact with Caucasian languages activate these processes, or is there a typologically more suitable explanation?

In Section 2, we introduce the concept of morpho-syntactic alignment and define ergativity in contrast to the other types. We also discuss various possible implementations of such a system. Then we review the literature to understand why ergative alignment is argued to be linguistically dispreferred. Next, in Section 3, we introduce the geographical region of interest and discuss briefly the anthropological (pre-)history of the relevant populations in order to contextualize the language contact considerations, which are further substantiated through linguistic arguments. In Section 4, we present the basic typology of Indo-Iranian ergativity, discuss its linguistic history, and provide a typological evaluation of the diachronic processes involved. Finally in Section 5, we summarize the discussion with the observation that although the synchronic typological consideration in Section 2 led us to the naïve expectation that Indo-Iranian ergativity might have emerged due to contact with Caucasian languages, the historical linguistic processes involved (Section 4) as well as the migration history of the people themselves (Section 3) reveal that this expectation was false. We thus arrive at the same conclusion for the Indo-Iranian family as Tuite (1999, 23) did for the indigenous Caucasian families, i.e. ergativity emerged in them independently and not due to language contact. We conclude the paper with a brief consideration of the implications of this finding on the wider field of linguistic investigations.

2. Morpho-syntactic Alignment

Predicates in human languages can be classified according to the number of their core-arguments, i.e. noun-phrases (NP) that are obligatory to complete their meaning and build a well-formed sentence. The predicates, usually verbs, with a single core-argument are called intransitive, and their sole core-argument is called the S-argument, where S stands for "subject-like":

English (Indo-European (Germanic) : England)
(1) He talks.
S verb

The verbs with two core-arguments are called transitive, and their two core-arguments are called the A-argument and the P-argument, where A stands for "agent-like", i.e. the undertaker or performer of the action expressed by the verb, and P stands for "patient-like", denoting the undergoer of that action:

English (Indo-European (Germanic) : England)
(2) He sees him.

A verb P

Morpho-syntactic alignment refers to the patterns of how a language groups these core-arguments in relation to one another.

2.1. Alignment Types

There are five ways of grouping the S, A and P-arguments (Velupillai 2012, 229–239):

1) Nominative-Accusative or Accusative Alignment: S and A are marked alike. P is marked differently.
2) Ergative-Absolutive or Ergative Alignment: S and P are marked alike. A is marked differently.
3) Neutral Alignment: S, A and P are all marked alike – usually completely lacking any marking.
4) Tripartite Alignment: S, A and P are all marked differently.
5) Double Oblique Alignment: A and P are marked alike, but S is marked differently.

Apart from these, there are two other important "split" morpho-syntactic alignment patterns (Nichols 1993 [2008], 40–41; Velupillai 2012, 253; Dixon 1994 [2010], 70–110):

6) Active-Stative or Active or Split-Intransitive Alignment: In this type of a system, some S-arguments are marked like A, and some are marked like P.
7) Hierarchical Alignment: In a transitive clause, whether A or P is marked similar to S is determined by some hierarchy, e.g. person or animacy hierarchy, between the two.

The morpho-syntactic alignment of a language is called "split", if different alignment pattern emerges in different kinds of clauses. Active is an inherently split pattern because the marking of S depends on the properties of the S. But languages may show other kinds of splits based on the properties of various elements of the clause. They may possess the so-called "split ergative" structure, where they use accusative-alignment with higher animacy A-arguments but ergative alignment with the others (Velupillai 2012, 256). Many Indo-Iranian languages show a different kind of split ergativity, where the alignment is determined by the tense-aspect of the verb as discussed in Section 4.

2.2. Alignment Realization Categories

For each alignment type, the marking, if any, can be realized on different categories of linguistic elements. In his classic work on ergativity, Dixon (1994 [2010]) divided manifestations of ergativity into two broad categories – intra-clausal and inter-clausal. The same division can be used for the other alignment types as well. In case of intra-clausal, the marking can be realized morphologically on the NP's filling the A/S/P argument slots, i.e. by case marking, e.g. in the English examples (1) and (2), both the A and S arguments have the same form *he*, while the P form differs – *him*. Alternatively, the marking may be realized on the verb by agreement marking with the A/S/P arguments, e.g. a comparison of the English examples (2), (3) and (4) reveals that the form of the transitive verb changes between *see* and *sees* when the A-argument is changed in number (specifically for the 3rd person in the present tense), but it is insensitive to the change of number of the P-argument:

English (Indo-European (Germanic) : England)

(3) He sees them.
A verb P

English (Indo-European (Germanic) : England)
(4) They see him.
A verb P

Similarly, a comparison between examples (1) and (5) reveals that the form of the intransitive verb changes in the same way between *talk* and *talks* when the P-argument changes in the same way, i.e. the intransitive verb adds an -s when the S is 3rd person singular, just as the transitive verb does based on A.

English (Indo-European (Germanic) : England)
(5) They talk.
S Verb

These considerations demonstrate that the English 3rd person present-tense verb-forms "agree" with the number of the A and S arguments in the same way, but there is no agreement with P. It is possible to mark the argument roles by word-order as well. From the English examples (1) – (5), it is clear that both A and S arguments occur before the verb, while the P argument occurs after the verb. All these three criteria reveal English as possessing an accusative alignment (cf. Section 2.1). Contrast this with the following perfect tense examples from Hindi (own examples):

Hindi (Indo-European (Indo-Aryan) : India)
(6) bahan uṭh-ī.
sister.F.SG get.up-PERF.F.SG
S verb
'Sister got up.'

Hindi (Indo-European (Indo-Aryan) : India)
(7) bahan-ne aṇḍe khā-e.
sister.F.SG-ERG egg:M.PL eat-PERF.M.PL
A P verb
'Sister ate eggs.'

In Hindi the S and P arguments are identically marked, i.e. without any marking, and the A argument is marked by an overt *-ne*. The verb, in turn, shows agreement with S and P arguments in number and gender, but not with A. This reveals Hindi as possessing an ergative alignment (cf. Section 2.1) in the perfect tense. Clearly, in a language like Hindi, where the verb does not appear between A and P (example 7), it is impossible to determine whether S occupies the same spot in its sentence as A or P. Therefore, the contrast between accusative and ergative alignment can surface in word order only for languages with a V-medial order, like English. In that case, whether S occupies the same slot as A or P would determine the alignment. In reality, "word-order-ergative" languages are rare. Dixon (1994 [2010], 50–51) presented only a handful of examples, all of them possessing additional means of marking argument roles rather than just word-order.

Most languages with nominative-accusative case marking mark the P-argument by the so-called accusative case, e.g. English *him, them* (examples 2–4). A and S are marked by the

nominative case, e.g. English *he, they* (examples 1–5). When the nominative form lacks an overt marking, as is often the case, it is called the "standard accusative" alignment. If, instead, the accusative case lacks overt marking but the nominative is marked overtly, it is called a "marked-nominative system" which is quite rare (Comrie 2013a). This rarity can be understood in terms of the principle of "economy" as illustrated by Song (2018, 155). It is more economical to leave the similar categories (i.e. S and A for an accusative system) unmarked, and mark only the distinct category (i.e. P for an accusative system). For similar reasons, in ergative-absolutive languages, the S and P-arguments, which take the "absolutive" case, e.g. Hindi *bahan, aṇḍe* (examples 6-7), are likely to lack overt marking, and the A-argument in the "ergative" case, e.g. Hindi *bahan-ne* (example 7), is likely to be marked.

Among inter-clausal alignment marking the most important criterion is "pivot". As Dixon (1994 [2010], 143) puts it: "In some languages there are syntactic constraints on clause combination, or on the omission of coreferential constituents in clause combinations. If these constraints treat S and O in the same way and A differently, then the language is said to be "syntactically ergative", with an S/O pivot." Note that O in Dixon's notation is the same as the modern P. Let us take the following English example as an illustration:

English (Indo-European (Germanic) : England)

(8) John saw Jill, and left.
A P (S)

In this example, the S-argument has been omitted from the second clause. By the rules of English grammar this is interpreted to be filled by "John" the A-argument of the previous clause, i.e. it leads to the interpretation: "John saw Jill, and John left" for (1). Therefore, English is a syntactic accusative language with an S/A pivot. If a language, instead, fills the omitted S-slot by Jill, the P-argument of the previous clause, leading to the interpretation of (1) as "John saw Jill, and Jill left" then that would be a syntactically ergative language with an S/P pivot.

2.3. Cross-linguistic Dispreference of Ergativity

Of the various alignment patterns, tripartite and double-oblique are relatively rare (Comrie 2013a; Comrie 2013b; Siewierska 2013). Several previous studies have also reported that ergativity is cross-linguistically dispreferred compared to accusative and neutral alignments. Nichols (1993 [2008], 57) termed it "recessive" because it has "low frequency, multiple grammatical restriction, and stronger viability as covert base than broad-daylight dominant alignment". In other words, in Nichols' (1993 [2008], 44) sample of 194 languages, ergativity was the dominant alignment in only 34 languages, i.e. 18%. In this context, she defined the dominant alignment as the non-neutral alignment pattern that appears in most of the possible alignment realization categories (cf. Section 2.2). Ergativity also has various restrictions, i.e. in most languages with ergative alignment, it is not the only morpho-syntactic alignment observed in the language, as Nichols (1993 [2008], 51) confirms based on her own sample and previous works of Dixon and Silverstein. She also concurs with a suggestion by Sapir that based on similar dominance considerations, the active-stative alignment system of every language can be considered the split of an underlyingly accusative or ergative system. This is what she calls the "base alignment" of an active-stative system (Nichols 1993 [2008], 52). In her sample, ergativity is about two times more probable in the form of the base alignment of an active-stative (i.e. split-intransitive) system than in the form of the dominant alignment of a non-split intransitive system (45% to 23%).

These observations have been corroborated by later studies. Bickel et al. (2015) have provided an interesting neuro-linguistic argument as to why ergativity may be a dispreferred pattern in nominal case marking. Their evidence suggests that while processing an auditory linguistic stimulus, the human brain interprets clause-initial unmarked nouns initially as the agent and re-adjusts that interpretation, if necessary, when the remaining part of the clause becomes available. They found that this holds true even for the native speakers of Hindi, a language with an ergative alignment in its perfective aspect system. From this result they surmise that it is more natural for the human brain to interpret an unmarked nominal form as the agent than as the patient. Therefore, the standard nominative-accusative case marking should be neurophysiologically preferred to the ergative. Consequently, they also show that languages are more prone to losing ergative-absolutive case marking in their history than gaining it, which lends support to the earlier findings. However, they observed exceptions to this trend in the Pacific and South American regions, which they attribute to language contact phenomena as well as random fluctuation.

Based on these findings from previous research, it could be expected that the Indo-Iranian branch of the Indo-European family may also have gained ergativity by contact with the languages of the Caucasus, where it is a common feature, unlike in the Indo-European family. The rest of the paper will investigate if the reality actually accords with this expectation.

3. The Indo-Iranian Speakers and their Caucasian Contacts

The Caucasus mountains are a linguistic hot-bed with about 50 languages belonging to seven different families (Tuite 1999, 4):

1) Northwest Caucasian or Abkhaz-Adyghean: Abhkhaz, Adyghe, Ubykh, etc.
2) Northeast Caucasian or Nakh-Daghestanian: Chechen, Udi, Archi, Avar, etc.
3) South Caucasian or Kartvelian: Georgian, Svan, Mingrelian, etc.
4) Indo-European: Armenian, Ossetic, Tat, Talyshi, Russian, etc.
5) Turkic: Noghay, Karachay, Azeri, etc.
6) Mongolic: Kalmyk.
7) Semitic: Neo-Assyrian dialect of Aisor.

Among these, the first three groups are considered to be indigenous to the Caucasus, i.e. their speakers are supposed to have lived in the region for all of their recorded history and reconstructible prehistory. They all show a preponderance of ergative-absolutive structures in their grammar (Tuite 1999, 8). The Indo-European family, especially in the form of its (Indo-) Iranian and Armenian branches, has also been a long-time neighbor to the Caucasian languages. In this paper we are specially concentrating on the Indo-Iranian branch that shows ergative alignment patterns, and investigate their contact with the Caucasian languages to evaluate whether that could be a factor in the emergence of ergativity in these languages.

3.1. (Pre-)History of the Indo-Iranian Speakers

Though the pre-history of the Indo-European speaking population is still debated, the most widely accepted version, called the Steppes Hypothesis, places them as a nomadic pastoralist culture in the Pontic-Caspian Steppes just north of the Caucasus from around 5th millennium BCE in various archeological cultures, the late phase of which is represented by Yamnaya a.k.a. Pit Grave culture around 3000 BCE (Olander 2019, 24). In the next centuries various groups of Late Proto-Indo-European speakers must have left this area and largely moved westwards into Europe to form the Corded Ware cultures. One of those groups, the future Indo-Iranians,

subsequently moved north and east to the Middle Volga (Fatyanovo, Abashevo and associated archeological cultures) and then further east to the Southern Ural to form Sintashta culture around 2000 BCE (Kuzmina 2007, 451). From Sintashta, a group expanded to the south/southeast into the Asiatic Steppe to form Andronovo cultural community between 2000 BCE and 1500 BCE (Parpola 2020, 188). From there they moved further south-east into the Indus Valley. This group is called the Indo-Aryan group. Another group of Sintashta people initially spread south-westwards back into Pontic-Caspian Steppe forming Srubnaya or Timber-Grave culture by 1500 BCE on the territory of the earlier Yamnaya culture (Kuzmina 2007, 452; Parpola 2020, 188). Thus, they came back into contact with the North Caucasus on one hand, and separated from the Indo-Aryans on the other. They were the future Iranians.

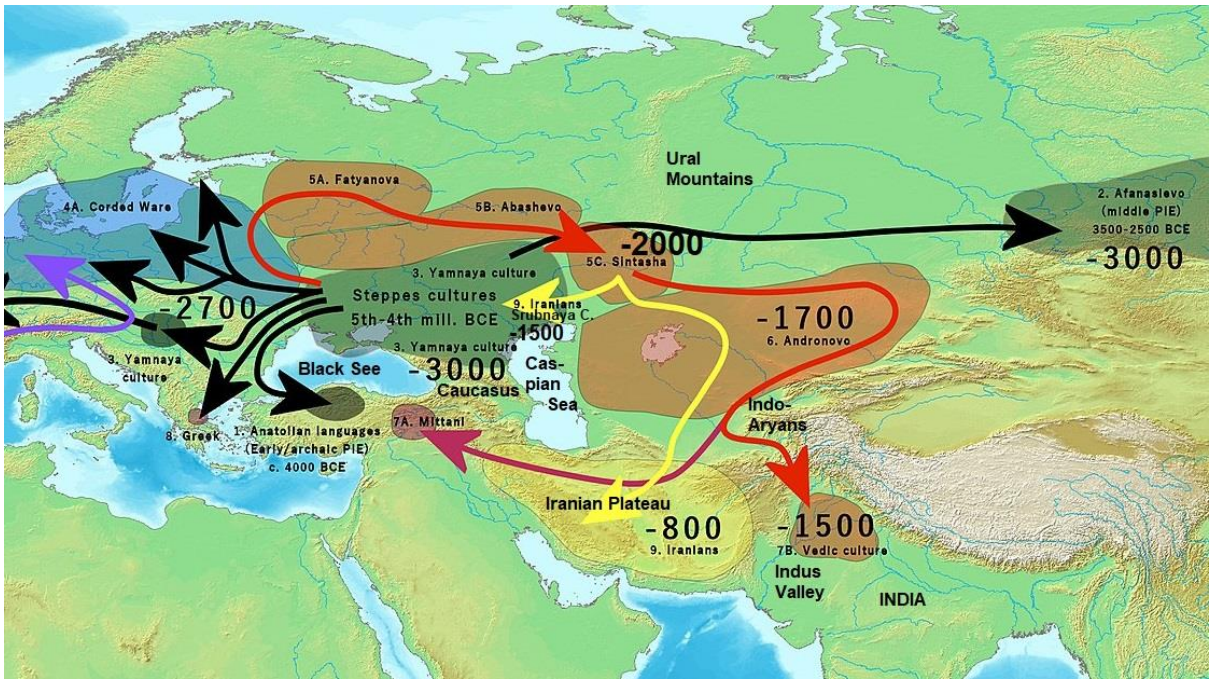

Figure 1. Migration of Indo-European peoples, including Indo-Iranians (3000 BCE to 800 BCE) according to the Steppe Hypothesis. [Map adapted under GNU Free Documentation License from https://commons.wikimedia.org/wiki/File:Indo-European_migrations.jpg.]

From Srubnaya culture the Iranians spread further west into the Danube Valley on the northwest coast of the Black Sea, as well as southeast into the territory previously occupied by Andronovo culture (Parpola 2020, 189). Spreading further south of Caspian Sea they came to occupy the whole of Iranian plateau by 800 BCE, thus coming in direct contact with the South Caucasus. At this time, Iranian languages would have been spoken all around the Caspian Sea except the Caucasus mountains themselves, and westwards on the north and west coast of the Black Sea. The northern part of this range has not been shown in Figure 1 to avoid cluttering. The tribes in the Iranian Plateau eventually formed state structures and built Median (7^{th} – 6^{th} c. BCE) and Persian (6^{th} – 4^{th} c. BCE) empires, who spread the Semitic Aramaic language and script widely as their chancellery language. The Steppe Iranian tribes, known as Scythians, Sarmatians, Sakas, etc. would eventually be replaced by Turkic and Mongolian tribes migrating from further east starting in the 4^{th} c. AD, except in the form of the modern Ossetes in the Middle of the North Caucasus, providing an excellent example of the Steppe as a spread zone and the mountains of Caucasus as a residual zone (Nichols 1992, 13–16).

3.2. Linguistic Traces of Contact between Indo-Iranian and the Caucasus

A lot has been written on the putative linguistic evidence of language contact between various stages of Indo-European/Indo-Iranian languages and the languages around them, including those of the Caucasus. Klimov (1998, IX-X) and Gamkrelidze and Ivanov (1995, 768, 774–776) adduced loanwords as well as morphological and phonological typology as evidence for contact between Proto-Indo-European and South Caucasian languages.

However, in keeping with the current dominant model of the Indo-European population history as presented above, much more effort has gone into investigating their linguistic contact with the languages of North Caucasus, e.g. a number of articles published in the 2019 issues of "The Journal of Indo-European Studies" centering around Bomhard (2019), where he supported the idea that (Pre-) Proto-Indo-European morphological system underwent heavy reorganization under the influence of early North-West Caucasian languages as well as proposed about 200 potential shared lexical items between them due to borrowing during/before the Yamnaya period. Anthony (2019) basically supported this idea based on genetic and archeological studies, but also mentioned the possibility of an even earlier influence from the Northeast Caucasian languages. Kortlandt (2019) also supported the idea, while Nichols (2019) and Tuite (2019) took a principled agnostic stance. Colarusso (2019), whose earlier works were cited extensively and approvingly by Bomhard (2019), supported a stronger thesis – that of genetic relation between Indo-European and Northwest Caucasian families. Based on such arguments, language contact between Proto-Indo-European and the Caucasus before about 3000 BCE remains a highly probable scenario.

Moreover, linguistic remains of the Iranian languages in the Pontic Steppes starting with the Srubnaya culture period around and after 1500 BCE is evident in the hydronyms of the region. River names like Danube, Don, Donets, Dnieper, Dniester, etc. all likely contain the Old Iranian word for a river – *dānu* (Parpola 2020, 189). Therefore, language contact with the Caucasus is likely also in this period.

4. Indo-Iranian split ergativity

Many Iranian and Indo-Aryan languages, irrespective of their current distance from the Caucasus, show some form of split ergativity as alluded to in Section 2.1, e.g. Kurmanji, Zazaki, Talyshi, etc. among the Iranian ones (Windfuhr 2009, 32–33), and Hindi-Urdu, Gujarati, Punjabi, Kashmiri, etc. among the Indo-Aryan ones (Verbeke 2013, 249). There are various differences in the exact manifestation of ergativity in these language (Patel-Grosz 2021; Haig 2017). However, they often share the features shown by the following Kurmanji Kurdish examples. When the verb is in a so-called perfect tense, the language takes ergative-absolutive alignment (example 10), but otherwise nominative-accusative alignment (example 9).

Kurmanji Kurdish (Indo-European (Iranian) : Turkey/Iraq/Syria)

(9) a. *ez* *di-kev-im*
1SG.NOM IMPRF-fall.IMPRF-1SG
S verb
'I am falling.' (Karimi 2012, 26)

b. *ez* *te* *di-bîn-im*
1SG.NOM 2SG.OBL IMPRF-see.IMPRF-1SG
A P verb
'I see you.' (Karimi 2012, 26)

c. *tu* *min* *di-bîn-î*

2SG.NOM 1SG.OBL IMPRF-see.IMPRF-2SG
A P verb
'You see me.' (Karimi 2012, 26)

Kurmanji Kurdish (Indo-European (Iranian) : Turkey/Iraq/Syria)

(10) a. *tu* *be* *pilîkān* *čuy-î*
2SG.NOM with stairs go.PERF-2SG
S verb
'You went down the stairs.' (Karimi 2012, 24)

b. *min* *tu* *dît-î*
1SG.OBL 2SG.NOM see.PERF-2SG
A P verb
'I saw you.' (Karimi 2012, 24)

c. *te* *ez* *dît-im*
2SG.OBL 1SG.NOM see.PERF-1SG
A P verb
'You saw me.' (Karimi 2012, 24)

Here we can observe that in the present/imperfect tense, Kurmanji has nominative-accusative marking both for the nominal arguments of the verb as well as the verbal agreement itself. Similarly, in the perfect/past tense, it has ergative-absolutive agreement marking on the nominal arguments as well as the verbal agreement. This is the pattern of split-ergativity that presents itself widely in Indo-Iranian languages.

It can be noted that in Kurmanji, the nominal case system does not distinguish all four relevant cases morphologically. It marks both nominative and absolutive syntactic cases by the morphological nominative case, and both accusative and ergative syntactic cases by the morphological oblique case. This is a common pattern among Iranian languages (Windfuhr 2009, 32–33), but the Indo-Aryan languages have often innovated secondary markers to implement more morphological case distinctions, giving rise, for example, to a tripartite case marking in Hindi-Urdu (Verbeke 2013, 252–255). Some other languages have completely lost the ergative structure through other processes. See Bubenik & Ziamajidi (2018) and Payne (1980) for some Iranian examples. Such variations of later date notwithstanding, the core of the system involving the accusative-ergative-split, as demonstrated by Kurmanji Kurdish, evolved through a common process in all these languages.

4.1. Diachrony of Indo-Iranian Split Ergativity

In this section, we will provide an outline of the linguistic process of the immergence of ergativity in Indo-Iranian languages based on scholarly consensus (Patel-Grosz 2021; Haig 2017, 469–474). In the next section we will evaluate whether this phenomenon might be the result of a language contact. Many scholars have putatively reconstructed the earliest stage of the Proto-Indo-European language as having active-stative or ergative-absolutive alignment, but the late phase of Proto-Indo-European is reconstructed more or less universally as a nominative-accusative language (Dahl 2022, 25), though Dahl (2022, 50) himself proposed a slightly different reconstruction – a neutral-accusative alignment split based on animacy. He concluded that the low-animacy nouns and pronouns, the so-called neuters, were disallowed as

A-arguments, and otherwise triggered neutral alignment (no verb agreement, and both S and P marked identically by *-m/Ø). He maintained the mainstream accusative reconstruction for the non-neuter nouns and pronouns. Be that as it may, late Proto-Indo-European would still be considered predominantly accusative in Nichols' (1993 [2008], 44) definition as introduced in Section 2.3.

The split-ergative alignment observed in modern Indo-Iranian languages is, in any case, not a continuation of any putative original early Proto-Indo-European ergative structure. Its historical seed lies in the Proto-Indo-European verbal adjective formation in *-tó- (and *-nó-), which is the source of the past (passive) participles in several Indo-European language families, e.g. Italic, Germanic, Balto-Slavic. However, it is variously reconstructed to Proto-Indo-European as not having any inherent voice (Grestenberger 2017, 110) or as "resultative" and "patient-oriented" (Kümmel 2020, 31). In any case, a general consensus seems to be reflected in the following statement: "in the system of the proto-language these [i.e. *-to-,*-no-, etc. – DJ] were derivational deverbal morphemes, i.e. they were not obligatory and were not integrated in verbal inflectional paradigms, as is also shown by their partly idiosyncratic semantics" (Luraghi, Inglese and Kölligan 2021, 360). Melchert (2017, 217) characterizes it as an adjective with an original "possessive" semantics, e.g. *$m\underset{\circ}{r}$-*tó*- ('having death', i.e. dead).

In Old Indo-Iranian languages, however, this suffix was grammaticalized to produce a stative/perfective participle, whose meaning was passive for transitive roots and active for intransitive roots. Unlike the original participles, which were uncommon as predicates, this new participle could be freely used as a predicate like normal adjectives. This usage provided an alternative way of expressing the past tense besides using a finite verb. Consider examples (11) and (12) from Old Persian inscriptions (own gloss):

Intransitive perfect participle (active meaning):

Old Persian (Indo-European (Iranian) : Ancient Persia)

(11)	*dūra-iy*	*aršti-š*	*parā-gma-tā*
	far-LOC	spear-F.NOM.SG	away-go-PPF.F.NOM.SG
		S	participle

'The spear has gone far away' (DNa 44-45)
(Skjærvø 2009, 144; www.livius.org)

Transitive perfect participle (passive meaning):

Old Persian (Indo-European (Iranian) : Ancient Persia)

(12)	*taya=maiy*	*kar-tam*
	which.N.NOM.SG=1SG.GEN	do-PPF.N.NOM.SG
	P=A	participle

'what I have done' or 'what has been done by me' (XPc 13)
(Skjærvø 2009, 145; www.livius.org)

Active finite intransitive verb:

Old Persian (Indo-European (Iranian) : Ancient Persia)

(13)	*adam*	*xšāyaθiya*	*a-bav-am*
	1SG.NOM	king.M.NOM.SG	PST-become-PST.ACT.1SG
	S		verb

'I became the king' (DB 1.60)
(www.livius.org)

Active finite transitive verb:

Old Persian (Indo-European (Iranian) : Ancient Persia)

(14)	*tayā*	*adam*	*a-gaṛbāy-am*
	which.F.ACC.PL	1SG.NOM	PST-seize-PST.ACT.1SG
	P	A	verb

‘(those) which I seized’ (DNa 17)
(www.livius.org)

From examples (11) to (14), we can notice the following salient features of the two constructions:

	Perfect participle construction	**Active Finite verb construction**
A-argument	Genitive case (example 12)	Nominative case (example 14)
P-argument	Nominative case (example 12)	Accusative case (example 14)
S-argument	Nominative case (example 11)	Nominative case (example 13)
Verb/Participle	Number & gender agreement with P/S	Number & person agreement with A/S

Table 1. Perfect Participle vs. Finite Verb Construction in Old Persian

Avestan and Sanskrit, the other two attested Old Indo-Iranian languages, also showed the same structure. The only difference lies in that Sanskrit usually marked the A-argument of the perfect participle construction by the instrumental case, but the genitive was also possible, and was arguably the inherited structure (Wackernagel and Debrunner 1954, 583). See also Kümmel (2017) for more details on this construction in various Old and Middle Indo-Iranian languages.

It is quite clear that the perfect participle construction, considered on its own, already shows an ergative-absolutive alignment both in the nominal marking (P and S are marked by the nominative case, and A by the genitive/instrumental) as well as in the verb-marking (identical agreement with P and S, but none with A). However, the languages are not considered ergative over-all because this construction functions in parallel to the over-all dominant nominative-accusative alignment shown by the active finite verb construction, and it is synchronically analyzed as a passive construction – at least for the transitive verbs – because of the structural and semantic parallelism to the passive finite verbal construction as shown below.

Passive finite transitive verb:

Old Persian (Indo-European (Iranian) : Ancient Persia)

(15)	*utā=šam*	*Ahuramazdā*	*naiy*	*a-jad-iya*
	and=3PL.GEN	Ahuramazda.NOM.SG	not	PST-worship-PST.PAS.3SG
	=A	P		verb

‘and Ahuramazda was not worshipped by them’ (DB 5.15-16)
(Payne 1980, 151; www.livius.org)

For transitive verbs, both the past participle construction and the finite passive constructions have the A-argument marked in the genitive, the P argument in the nominative and the verb agreeing to P.

In a wide variety of Indo-Iranian languages, the inherited finite verb construction for the past tense was eventually completely lost, leading to the perfect participle construction becoming the sole means of expressing the past tense. The finite verb present tense formation was, however, mostly maintained in the daughter languages. This generally gave rise to a situation

where the languages use a nominative-accusative alignment in the present tense but an ergative-absolutive one in the past tense. The Kurmanji-style case marking as shown in examples (9) and (10) came about through the additional merger of all non-nominative cases into a single oblique case, but this has no bearing on the emergence of ergativity itself. In summary, we can surmise from the above discussion that split-ergativity in Indo-Iranian owes its existence to two consecutive historical processes:

(1) Grammaticalization of the Proto-Indo-European *-tó-/-nó- verbal adjectives as a past/perfect participle with an active semantics for the intransitive verbs and a passive semantics for transitive verbs,
(2) The loss of inherited past tense finite verbs, and reinterpretation of the above-mentioned structure from a passive to the unmarked perfect/past tense construction.

4.2 Diachronic Typology of Indo-Iranian Ergativization

In this section, findings from existing typological research are utilized to assess if the changes described in Section 4.1 are cross-linguistically typical and whether we need to invoke language contact as a factor in the emergence of these changes.

4.2.1. Verbal Adjective to Perfect Participle

The first step consists of the following components in no particular order:

(1.1) The grammaticalization of the *-tó-/-nó- formation as a participle.
(1.2) Fixation of its semantics as a past/perfective/resultative state.
(1.3) Its acquisition of the characteristic voice-orientation/semantics.
(1.4) Its generalization to all verbs.

Haspelmath (1994, 170) argued that it is typologically common for adjectives derived from verbal nouns to grammaticalize as participles. While it is not clear if Proto-Indo-European *-tó-/-nó- derived from a verbal noun, the same semantic argument can be applied to them, because of their close association with the verbal root. Therefore, it is typologically unsurprising that they became participles in various daughter languages.

Similarly, based on Melchert (2017, 217) and Wackernagel & Debrunner's (1954, 576) characterization of these suffixes as signifying the possession of the properties of the corresponding verb in Proto-Indo-European, its reinterpretation as resultative, as characterized in Kümmel (2020, 31), is unremarkable because a state which possesses the properties of a verb can very well be viewed as the result of the application of that verb.

Moreover, Haspelmath (1994, 159) pointed out that resultative participles tend to grammaticalize as past passive participles for transitive verbs and past active participles for telic or unaccusative intransitive verbs. He argues that because participles are adjectives, and adjectives tend to be more time-stable than verbs, participles are more likely to express a state than an event. However, for resultative participles to be able to form from a verb, it is necessary that a participant in the event expressed by the verb attains a new *resultant* state. Usually, this happens to the patient of a transitive verb, but also to the sole-argument of an unaccusative intransitive verb, i.e. verbs with a patient-like S-argument. This is why it is possible to say in English "a wilted flower" but not *"a danced boy". Similarly, telicity implies achieving a goal and thereby achieving a new state. Therefore, it is typologically unremarkable for originally resultative participles to acquire the passive for transitive and active for intransitive semantics, though they are not permitted on all intransitive verbs. In fact, Haspelmath (1994, 161–162)

seems to characterize the Proto-Indo-European *-tó-/-nó- marker as a resultative passive/unaccusative participle just as Kümmel ("patient-oriented", Cf. Section 4.1). Consequently, the characteristic voice-alignment of *-tó-/-nó- in Proto-Indo-European is typologically expected.

According to Haspelmath (1994, 162), languages like Russian and Latin lost the (restricted) intransitive usage of this affix, turning it into a pure past passive participle. Indo-Iranian and Germanic languages, on the other hand, extended its use to all transitive and intransitive verbs. This can be explained as a straight-forward application of analogy. All the four individual components in the emergence of the Indo-Iranian perfect participle are therefore typologically unmarked.

4.2.2. Loss of Finite Past Tense Forms

The second step in the emergence of ergativity, i.e. the loss of past tense finite verbs, took place after the middle of the first millennium BCE, when the Indo-Iranian languages had already spread to their historical extent. The two oldest Indo-Iranian languages – Sanskrit and Avestan – retained all three finite past tenses reconstructed for late Proto-Indo-European, i.e. aorist, imperfect and perfect. Old Persian (mid-1st millennium BCE) already showed a collapse of the three into one finite past tense. Early Middle Iranian and Early Middle Indo-Aryan languages also show the same state, e.g. on the Iranian side (early) Middle Persian (Bubenik and Ziamajidi 2018, 79), (early) Sogdian, Khwarezmian (Kümmel 2020, 32) and on the Indo-Aryan side Pali, Ashokan Prakrit (Oberlies 2003, 197–198) and Ardha-Magadhi (Bubenik 2003, 228). In fact, in a few languages this collapsed finite past tense formation is still alive, e.g. Yaghnobi (Iranian) (Khromov 1972, 30, 122; Kümmel 2017, 142), Kalasha and Khowar (Indo-Aryan) (Bashir 2003, 822).

Exceptions notwithstanding, this is indeed the case that the finite past tense forms were generally lost in the Indo-Iranian languages by about the middle of the 1st millennium AD, while the present tense forms mostly survived. It requires an explanation. However, it is hard to imagine that any one area-specific language contact scenario can explain this event because of its huge areal scope - from Anatolia to Eastern India – and a relatively short time available for it to spread (about 5 centuries) through a fractured post-Alexander political landscape. Therefore, we need a typologically more general answer, that would be applicable to these languages independently. We would like to tentatively propose one such mechanism: the sociolinguistics of adult language learning. As the Indo-Iranian languages spread over a huge territory, they were used more and more often by adult L2-speakers. Maybe, they avoided learning the more marked past tense forms but learnt and used the present tense ones. See Greenberg (1966 [2005], 48) for relative markedness of tenses. Perhaps, the participial formation initially felt like a normal adjective usage not taking part in the verbal markedness hierarchy, and it thus survived longer than the finite past tense formation.

5. Conclusion

The present investigation was initiated with the observation that "nearly all Caucasian languages can be described as ergative, i.e. as manifesting ergative/absolutive alignment in a significant portion of their morphosyntax" (Tuite 1999, 8) and that Indo-Iranian languages which are and have been their neighbors for many millennia also tend to show split-ergativity. We also found out that ergativity is expected to be cross-linguistically dispreferred, but it tends to cluster areally, which seems to be usually due to language contact (Cf. Section 2.3.).

On this background, we searched for evidence whether the emergence of ergativity in Indo-Iranian languages was influenced by the languages of the Caucasus. We identified two steps in its historic origin (Cf. Section 4.1). All the four components of the first step were shown to be typologically unmarked, and could easily happen within the history of Proto-Indo-Iranian without external stimulation (Cf. Section 4.2.1). Crucially, the fourth component, i.e. the extension of the perfect participle to atelic unergative intransitive verbs, must have taken place after the break-up of the Proto-Indo-European linguistic unity, since Latin and Slavic took a different path, but before the separation between Indo-Aryan and Iranian, as this innovation is shared by both of them. This would place its occurrence after the ancestors of the Proto-Indo-Iranian speakers left the Yamnaya region, but had not yet split into Srubnaya and Andronovo cultures (Cf. Section 3). They would be located at this time on the Middle Volga or South Ural, i.e. Fatyanovo, Abasyevo, or Sintashta culture. Because this region is relatively far away from the Caucasus, it is unlikely that any language contact with the Caucasus triggered this grammaticalization. Therefore, we conclude that the first step as a whole seems to be a typologically favored language-internal development without requiring any contact-induced motivation. For the second step we conjecture that it may have been influenced by the tendencies of adult language learning in general, but further investigation is required to confirm or reject that hypothesis (Cf. Section 4.2.2). Whatever be the correct explanation for this step, we conclude that it must be a typologically favored process that can be assumed to apply to the various Indo-Iranian languages or sub-areas independent of each other.

These findings provide an example of emergence of ergativity in an accusative language through typologically unmarked processes. This is a valuable observation in the context of the dispreference of ergativity, discussed in typological literature. In combination with Tuite's (1999, 23) findings that there is no evidence that the emergence of ergativity in the three indigenous Caucasian language families is contact-induced, the findings of this paper raise the questions: Exactly how dispreferred is really ergative alignment compared to accusative and neutral? Is there any weakness in the previous works that make this claim? As a matter of fact, Bickel et al. (2015, 18) did provide the caveat that their finding of cross-linguistic preference of treating clause-initial unmarked NP as agent was based on the study of Hindi, which is a split-ergative language (Cf. Section 2.3). In a consistently ergative language, their results might turn out to be different. In other words, the neurophysiological constraints on ergativity that they proposed would require additional investigation and validation.

It may also be instructive here to consider where these findings are *not* applicable as typological argument. Dixon (1994 [2010], 185) and Harris (1985, 5) both cited Klimov (1973) as hypothesizing that ergativity only occurs as a transitional situation on the way of a language changing from active-stative to nominative-accusative alignment, and proceeded to refute that hypothesis. In fact, Harris used the emergence of ergativity in Indo-Iranian from an accusative structure as a counter-example. However, Klimov (1973, 200) really only dealt with the emergence of *sustained* or *consistent* ("выдержанная") ergativity, which he categorically pointed out that the Indo-Iranian languages do not possess. In our opinion, his view is justified given the prominence of the accusative alignment in a large proportion of clauses in these languages. Therefore, Klimov's hypothesis may turn out to be right or wrong, but the Indo-Iranian situation is, in any case, not relevant to evaluating it.

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List of abbreviations

Abbreviations	Significance
1	1st person
2	2nd person
3	3rd person
A	The ‘Agent’-like argument of a transitive predicate
ACC	Accusative
ACT	Active
ERG	Ergative
F	Feminine
GEN	Genitive
IMPRF	Imperfect
LOC	Locative
M	Masculine
N	Neuter
NOM	Nominative
OBL	Oblique
P	The ‘Patient’-like argument of a transitive predicate
PAS	Passive
PERF	Perfect
PL	Plural
PPF	Perfect participle
PST	Past
S	The ‘Subject’-like or sole argument of an intransitive predicate
SG	Singular

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