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The passive voice in ancient Indo-European languages: inflection, derivation, periphrastic verb forms

Abstract: The IE languages developed different strategies for the encoding of the passive function. In some language branches, the middle voice extended to the passive function to varying extents. In addition, dedicated derivational formations arose in a number of languages, such as the Greek *-ē-/-thē-* aorist and the Indo-Aryan *-ya-*presents. Periphrastic formations involving a verbal adjective or a participle are also widely attested, and played an important role in the building of the passive paradigm in e.g. Romance and Germanic languages. As the periphrastic passive is also attested in Hittite alongside passive use of the middle, both strategies seem to be equally ancient. Some minor strategies include lexical passives and the extensive lability of verbs. A survey of possible strategies provides evidence for the rise of a disparate number of morphemes and constructions, and for their ongoing incorporation into the inflectional paradigms (paradigmaticization) of given languages, thus adding to our knowledge about cross-linguistic sources of passive morphology and grammaticalization processes involved.

Keywords: ancient Indo-European languages; derivation; inflection; middle voice; passive; periphrastic forms

1 Introduction

The Indo-European (henceforth, IE) languages inherited from Proto-Indo-European (henceforth, PIE) a two-way voice system, with an opposition between

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an active and a middle voice, both inflectional and with complete paradigms at least in the present and in the aorist.[1] In most languages, the middle voice also acquired the function of a passive. This development is usually held to have taken place at a late stage of PIE, or possibly later, in the individual languages. However, this is not the only way in which the ancient IE languages acquired a third voice distinction:[2] as is well known, Indo-Iranian and Greek also have a distinct passive, at least in some tenses, while Hittite makes use of a periphrastic passive from its earliest stages. The way in which this third voice was created in individual languages and language families involves an interaction of inflectional and derivational processes, with derivational means increasingly acquiring a place in inflectional paradigms. In addition, periphrastic verb forms occur at very early stages in some language families, sometimes involving only part of the paradigm, as in Latin or Gothic.

The interaction of inflection, derivation, and periphrastic formations, and the paradigmatization of forms that in origin featured different morphological processes have never, to our knowledge, received a unified treatment encompassing all branches of the Indo-European language family. In this paper, we aim to bridge this gap, and offer a comprehensive view of the rise of the passive voice in individual languages.[3] We also provide some details about developments and tendencies at stages that follow those of the earliest sources. While the aim of this paper remains mainly descriptive,[4] by highlighting such developments we also

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1 The reconstruction of the middle paradigm in PIE is a notoriously controversial topic, especially in its connection to the PIE perfect and the Hittite *-ḫi* conjugation (see Jasanoff 2003; see also Kümmel 2020 for a recent discussion). The reconstruction of the inflectional middle is further complicated by the fact that individual branches do not agree in the shape of the endings. Some languages, including Hittite, Italic, Celtic and Tocharian, make use of a distinctive component *-r* in the present (e.g. 3SG Hitt. *-tari*, Lat. *-tur*), while languages such as Ancient Greek and Indo-Iranian show present middle endings in *-j* (e.g. 3SG Gk. *-tai*). For the purpose of this paper, we regard *r-* and *j*-middle endings as essentially equivalent. The language-specific shape of the middle endings, as well as their reconstruction, falls beyond the scope of this paper, and will not be discussed further here. For further reference see various IE linguistics textbooks including Adrados et al. (2016), Brugmann (1916), Clackson (2007: 142–151), Fortson (2010: 93–95), Meier-Brügger (2010). On the distribution of middle endings in IE languages, see the description of individual languages in Fortson (2010) and Kapović (2016).
2 We use the term 'voice' in reference to active, middle and passive forms in accordance with the tradition adopted in Indo-European linguistics. For a typological definition of verbal voice see Zúñiga and Kittilä (2019: 4).
3 A recent overview of passive constructions in Ancient IE languages has been presented by Fellner and Grestenberger (2017).
4 A reviewer points out that our paper "does not attempt to provide explanation for many of these developments". While we certainly do not deny the importance of finding explanations for the trends we describe, we think that this should be the task of (at least) another paper: indeed, a

strive to add evidence to what is known about the sources of passive markers. Indeed, as pointed out in Haspelmath (1990: 25) "attention from the point of view of syntax corresponds [to] a relative negligence of the morphological aspects of passive constructions, most importantly the passive marker on the verb". Notably, this still holds after a time span of three decades.

The paper is organized as follows. In Section 2, we discuss the use of the inherited middle voice with passive function in various ancient IE languages, concentrating on Greek (Section 2.3), Indo-Iranian (Section 2.4), and Latin (Section 2.5). In Section 3 we move on to discuss innovative morphological markers for the passive function in Greek (Section 3.1), Indo-Iranian (Section 3.2), Old Irish (Section 3.3) and Middle Armenian (Section 3.4). Section 4 is devoted to the discussion of periphrastic passive constructions, with a focus on Hittite (Section 4.1), Latin (Section 4.2), Slavic (Section 4.3), Indo-Iranian (Section 4.4), Germanic (Section 4.5) and Armenian (Section 4.6). In Section 5, we give an overview of marginal strategies employed to encode passive function in early IE languages, such as lexical passives (Section 5.1) and resultative and stative constructions (Section 5.2), with a focus on lability and conjugation class change in Armenian (Section 5.3). Section 6 contains the conclusions.

Before going into the discussion of the data, some more attention needs to be paid to our definition of passive. The literature on passive, its role within voice systems, passive constructions and their properties is very extensive, and we do not wish here to enter a theoretical discussion on what qualifies as passive (see among others Keenan and Dryer 2007; Shibatani 1988; Siewierska 1984, 2013; Zúñiga and Kittilä 2019: 82–102; the collections of papers in Abraham and Leisiö 2006; for a recent discussion in relation with voice in Indo-European languages see Grestenberger 2021). For the purpose of our paper, we adopt a somewhat adapted version of the criteria set out in Haspelmath (1990: 27), integrated with the definition of prototypical passives in Zúñiga and Kittilä (2019: 83), and consider passive those constructions that show the following properties:[5]

(i) the construction is somehow restricted vis-à-vis another unrestricted construction (the active), e.g. less frequent, functionally specialized, not fully productive;

(ii) the active direct object (O) corresponds to the subject (S) of the passive;

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comprehensive description is a necessary preliminary for explanatory studies. As such a comprehensive description is missing, we aim to bridge this gap and pave the way for further research.

5 Grestenberger (2021), following formal approaches (Alexiadou and Doron 2012; Alexiadou and Schäfer 2013; Alexiadou et al. 2015) makes a distinction between two types of passive based on "whether they select a transitive input structure or are compatible with intransitive verbs".

(iii) the active subject (A) corresponds to a non-obligatory oblique phrase or to nothing;

(iv) syntactic valency is reduced by one argument compared with the active diathesis (e.g., the verb is monovalent when its active counterpart is bivalent).

Point (iii) must be given special attention.[6] As we will see, the passive interpretation of some constructions and of some morphemes crucially depends on the occurrence of an agent phrase. On the other hand, some constructions that can express a passive meaning remain marginal on account of their non-occurrence with agent phrases (see especially Section 5). Notably, non-occurrence with agent phrases is determined by various factors, including the verb's semantics, the properties of the agent participant (A), and the type of construction (see Siewierska and Bakker 2012). It does not depend on the reconstructability of a specific way of encoding passive agents in PIE, on which there is no general agreement (see Hettrich 1990; Jamison 1979; Luraghi 1986; Melchert 2016 among others).

2 The medio-passive

In this section, we discuss the use of inherited middle forms to express the passive meaning. After a survey of the reconstructed voice system of PIE (Section 2.1) and a survey of voice opposition across the IE languages (Section 2.2), we focus on Greek (Section 2.3), Latin (Section 2.4) and Indo-Aryan (Section 2.5). We conclude showing some general tendencies of ancient IE languages with respect to the passive use of the middle voice, and highlighting divergent developments in the languages surveyed in greater detail (Section 2.6).

2.1 The PIE middle voice and its reflexes in IE languages

The original meaning/function of the PIE middle voice is a matter of discussion (see, among others Benedetti 2006; Clackson 2007: 142–151; Grestenberger 2016; Inglese 2020; Kulikov and Lavidas 2013; Luraghi forthcoming; Meiser 2009), but there is general agreement on some at least partial connection with uncontrolled events, both stative and inchoative (i.e. involving a change of state), and with reflexivity, while the passive function represents a later development. How these meanings may connect with the passive function has been discussed in the

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6 Among other things, this is a distinctive feature of passives as opposed to anticausatives, which never allow agent expressions (Zúñiga and Kittilä 2019: 41).

framework of IE linguistics and of linguistic typology. As this semantic extension is not the focus of this paper, we refer to Creissels (2006: Chs. 22, 23), Haspelmath (1990), Kemmer (1993: 196–198), Kulikov (2013), Zúñiga and Kittilä (2019: 223–226) among others, for details.

Here, we would like to stress the fact that the existence of a sizeable number of *media tantum* in several ancient IE languages points to a possible lexical distribution of active and middle voice at least at an early stage of PIE. This situation may be reflected in the occurrence of only a few verbs that display voice alternation in Old Hittite (OH) originals: *ḫalzai-* 'call', *ḫantae-* 'align', *ištarni(n)k-* 'afflict', *nai-* 'turn', and *šuppiaḫḫ-* 'purify' (and possibly *markiye/a-* 'refuse').[7] The middle forms of *ištarni(n)k-*, *ḫantae-*, and *nai-* have anticausative meaning; the middle forms of *šuppiaḫḫ-* have reflexive meaning, while the middle of *ḫalzai-* is impersonal or passive (cf. Inglese 2020: 201–206; Luraghi 1990: 135 note 76; Neu 1968: 115–116; see further Melchert forthcoming). Voice alternation expanded after the OH period, when more *media tantum* developed active forms, while *activa tantum* developed middle forms (Inglese 2020: 206–218).

Similarly, in Ancient Greek voice opposition, though well attested in Homeric Greek, expanded further at later language stages. Indeed, several verbs that occur in Homer as *media tantum* or *activa tantum* show new forms with voice opposition at later stages of the language, as for example Homeric *théromai* 'be warm' versus later *thérō* 'warm up (tr.)', *atúzomai* 'fear' shows some active forms in later epics with the meaning 'frighten' (see Delbrück 1897: 410; Lazzeroni 2004: 143; Luraghi 2020). Notably, *media tantum* developing new active forms follow this pattern, and instantiate the anticausative alternation (see Allan 2003: 50–51). *Activa tantum* also show new middle forms in the course of time, but such development could have two opposite results: either it remained limited to specific tenses, typically the future, and did not bring about any semantic opposition, or it created an active/passive opposition (see Schwyzer and Debrunner 1959: 225–226).

As we discuss in Section 2.2, with the exception of Balto-Slavic all language branches inherited at least in part the inflectional middle of PIE: these include Anatolian, Indo-Iranian, Greek, Italic, Celtic, Armenian, Tocharian, Albanian, and, among Germanic languages, Gothic. By the time of the earliest attestations, the Balto-Slavic languages had already developed the so-called reflexive middle, typical of many European languages today. They do not show any reflexes of the PIE inflectional middle, and the passive voice is expressed by periphrastic constructions involving participles (Section 4.3).

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7 Some OH middle verbs lack an active counterpart in Old Script (OS), but this might be an accidental gap, see Inglese (2020) for details.

2.2 The medio-passive in Indo-European languages

In the languages that preserve its reflexes, the middle may also function as a passive, though to different extents. In Gothic, the extant middle forms are virtually all passive, and are restricted to the present tense indicative and optative (Braune 2004: 141; Kleyner 2019; see Braune 2004: 148, 158 for a list of synthetic passive forms). The passive function of these forms is shown by the fact that they usually translate Greek medio-passive and passive forms, as in (1).[8]

(1) *twos   wairþand   malandeins   samana, aina*
     two:NOM   AUX.PRS.3PL grind:PTCP.NOM.PL.F together one:NOM.SG.F
     usnimada   jah anþara   bileiþada
     take:PRS.M/P.3SG and other:NOM.SG.F leave:PRS.M/P.3SG
     'Two women shall be grinding together; the one shall be taken, and the other left.'
     (Luke 17.35; Gk. *ésontai dúo aléthuosai epì tò auto, hē mía paralēmphthḗseta* [take.FUT.PASS.3SG] *hē dè hetéra aphethḗsetai* [leave.FUT.PASS.3SG])[9]

In the other Indo-European languages, one must distinguish between verbs that can have voice alternation, and *media tantum*, or deponent verbs, that only have middle morphology. The latter may be transitive, and, in some languages, they can occur in impersonal passive constructions. However, they do not develop special morphology; for this reason, they will not be further discussed here (on deponent verbs in PIE see Grestenberger 2016).

In Hittite, as we have remarked above, voice alternation was on the rise. After the Old Hittite period, verbs increasingly display voice alternation. Among other meanings typical of the middle voice, the Hittite middle also features the passive

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8 While Gothic passives are often used to translate Greek medio-passives, there are also instances of active verbs in Greek translated as passives in Gothic. See Kleyner (2019) and Ratkus (2020) for a critical discussion of the Gothic material.
9 Examples are glossed following the *Leipzig glossing rules* (https://www.eva.mpg.de/lingua/pdf/Glossing-Rules.pdf). Note that in this paper, we gloss as M/P forms that feature continuants of the PIE medio-passive inflection, irrespective of their function in context. Separate glosses MID and PASS are given for those constructions that distinguish between the two (e.g. the Ancient Greek aorist system). Other glosses include: AOR = aorist, CONN = connective, GERV = gerundive, IMPF = imperfect, PERL = perlative, PPP = perfect passive participle, PTC = particle, PREV = preverb. Translations of examples are ours or adapted from reference editions. Textual sources of examples are indicated following the standard practices and abbreviations in the field.

function, which becomes prominent especially in New Hittite (see Inglese 2020: 221; Melchert forthcoming).[10] Let us consider example (2).

(2) *n=ašta*   MUL-*aš*   *nepišaz katta maušzi*   KUR-*yaš*
     CONN =PTC   star:NOM   sky:ABL down fall:PRS.3SG   country:GEN
     A.ŠÀ   *kuraš*   IZI-*it*   *warnutari*
     field   slice:GEN   fire:INS   burn:PRS.M/P.3SG
     'When a star falls down from the sky, the field of the country will be burned by fire.'
     (KUB 8.25 i 3, NH)

The verb *warnutari* is a medio-passive form of the causative of the *medium tantum war-* 'be burning'. In (2), it functions as passive, as shown by the occurrence of the agent/force phrase IZI-*it* 'by fire'.[11] Its meaning is similar to the meaning of the basic verb: indeed, -*nu-* causatives are often regarded as fulfilling the function of active counterparts of some *media tantum* (Neu 1968: 53).

Tocharian also displays traces of the inherited middle voice (Pinault 2008: 622–624, 629–630; see Adams 2015; Malzahn 2010: Ch. 5; Schmidt 1974 for a thorough discussion). Besides a number of *media tantum*, one also finds a few verbs that occur both in the active and in the middle. Specifically, the middle voice operates as a valency decreasing device, mostly with passive meaning (see especially Adams 2015 on Tocharian B).[12] An example from Tocharian A is (3), which contains an agent phrase in the perlative case.[13]

(3) *kuṣtlwākā*   *tā=śśi*   *yärtär*
     predator:PERL.PL   where=PTC   drag:PRS.M/P.3SG
     'Where is he being dragged by the predators?'
     (CEToM A 55 b2)

The most detailed evidence for the outcome of the PIE middle in Celtic comes from the better preserved Insular Celtic languages, chiefly Old Irish. The PIE middle

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10 Evidence for a passive use of the inherited medio-passive inflection in other Anatolian languages is rather scanty, and most of the alleged evidence is controversial at best. See Inglese (2020: 87–88) with references.

11 Agent/force is encoded through the instrumental or the ablative case in Hittite. Notably, agented passives do not occur in OH originals (data from Inglese 2020: 141).

12 A limited number of anticausative middle forms occur (see Malzahn 2010: 87, 102). However, the anticausative alternation in Tocharian is predominantly encoded by stem alternation rather than by voice, see Carling (2003) and Malzahn (2010: Ch. 4).

13 Animate agents are encoded through the perlative case in Tocharian, while inanimate forces/causes are encoded in the instrumental (attestations are limited to Tocharian A), see Luraghi (1986).

gave rise to two distinct inflectional paradigms in Old Irish: the deponent and the passive. In the first place, Old Irish features a number of 'deponents', that is, *media tantum*, which display an inflection distinct from the active in all tenses. The deponent inflection is characterized by *r*-endings and historically derives from the PIE middle (see Cowgill 1983; McCone 2005; Watkins 1969: 12–17). The PIE middle also lies behind the present passive inflection, which likewise features *r*-endings, as in e.g. *beirid* 's/he carries' versus *berair* 's/he is carried'. As deponents show, already in Old Irish, a tendency to be transferred to the active paradigm (Cowgill 1983: 73; Thurneysen 1998: 328), the reflex of the PIE middle remained increasingly limited to the passive. Hence, one can say that, in this respect, Old Irish aligns with Gothic (as described above) and Latin (Section 2.4) in showing a strong specialization of the inflectional middle for the passive functions since its earliest stage: indeed, other oppositional functions of the middle are unattested in Old Irish. In the preterite, *-r* endings are attested for deponent verbs only, whereas a new passive paradigm has been created on the basis of the PIE verbal adjectives in *-to-* (McCone 2005: 231–236; Thurneysen 1998: 437–440). We discuss this new formation in Section 3.3.

In spite of its late attestation, Albanian shows traces of the PIE middle voice. This language displays an alternation between active and non-active inflection, the latter indicating a range of functions including passive, reflexive, and anti-causative (see Kalulli 2006: 443; Rusakov 2016: 584 for an overview). In the present and the imperfect, non-active voice is indicated by a dedicated set of endings that directly continues the PIE middle voice (Orel 2000: 213; Rusakov 2016: 594). In addition, the passive function can also be indicated by participles of transitive verbs with the copula *jam* 'be' in periphrastic tenses. Elsewhere, the system has partly been reshaped, with other finite and non-finite non-active forms of the verbs marked by the clitic form *u*. Notably, this form is the outcome of the PIE reflexive pronoun **sw-* (Orel 2000: 213; Rusakov 2016: 596), which has been fully integrated in the verbal paradigm and can also function as a passive marker. Similar developments, whereby an original reflexive marker shifted to the encoding of the middle voice, including the passive function, are also attested in (Balto-)Slavic (Section 4.3), Germanic (Section 4.5), and Romance languages, as thoroughly discussed by Kemmer (1993).

2.3 Ancient Greek

In Homeric Greek, the passive function is partly associated with the middle voice, even though, as noted by Chantraine (1953: 180), a passive reading of the middle is often dependent on the context: in other words, middle forms may have passive meaning but not necessarily. Thus, as has been argued in Luraghi (2010a), it is often

the case that the occurrence of an agent phrase triggers a passive interpretation, which would not be available if no agent phrase co-occurred, as shown in (4)–(6):

(4) *è   mála   dḗ   se   biázetai   ōkùs   Akhilleús*
PTC   much   PTC   2SG.ACC   constrain:PRS.M/P.3SG   swift:NOM   A.:NOM
'Certainly swift Achilles does great violence to you.'
(*Il.* 22.229)

(5) *Eurúlokh', è   mala dḗ me   biázete   moûnon*
E.:VOC   PTC much PTC 1SG.ACC   constrain:PRS.2PL   alone:ACC
eónta
be:PTCP.PRS.ACC
'Eurylochus, you do great violence to me, who stand alone.'
(*Od.* 12.298)

(6) *Aías   d' oukét' émimne: biázeto   gàr beléessin*
A.:NOM PTC NEG   remain:IMPF.3SG   constrain:IMPF.M/P.3SG   PTC dart:DAT.PL
'But Aiax could not hold on, as he was oppressed by darts.'
(*Il.* 11.575–6)

In (4) and (5) both the medio-passive form *biázetai* and the active form *biázete* have active function, and accordingly take accusative direct objects, *se* 'you' in (4) and *me* 'me' in (5). In (6) the agent/instrument phrase *beléessin* 'by darts', 'with darts' along with the absence of an accusative object induces a passive interpretation.

On the other hand, there are verbs whose passive function does not depend on the occurrence of an agent phrase, such as verbs of consumption, as in (7).

(7) *hóssa   toi ekpépotai   kaì edḗdotai   en*
how_much:NOM   PTC drink:PRF.M/P.3SG   and   eat:PRF.M/P.3SG   in
megároisi
palace:DAT.PL
'All that has been drunk and eaten in (your) palace.'
(*Od.* 22.56)[14]

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14 Notably, the forms *ekpépotai* and *edḗdotai* are middle perfects. The middle of this tense is thought to have originated at a late stage, when the perfect acquired object-oriented meaning, see Crellin (2020: 438, 454–457), Schwyzer and Debrunner (1959: 263–264), Willi (2018: 219–220). Indeed, originally the function of the perfect was "that of a subject-oriented resultative or 'intensive' present, the pluperfect being its past, i.e. a stative imperfect" (Kümmel 2020: 28). In practice, in Ancient Greek the perfect forms may express "pure state, resultative and anterior semantics" and these meanings show a lexical distribution based on the different types of verb bases that the perfect may occur with (Crellin 2020: 437).

The future of the verb *édō* 'eat' always has middle morphology and active meaning; cf. Luraghi (2010a: 63).[15]

2.4 Latin

The Latin verb shows signs of deep restructuration of the verbal system traditionally reconstructed for PIE (Clackson and Horrocks 2007: 18–26; Fortson 2010: 278–281 with further references). Finite forms of the verb are based on two stems, the present stem or *infectum*, which mostly continues the PIE present and includes a newly created imperfect, and the perfect stem or *perfectum*, which is based on the merger of the PIE aorist and the perfect, along with the newly created *u*-perfects.

Concerning verbal voice, Latin inherited the two-fold active versus medio-passive voice opposition, which is only preserved in the *infectum* (see Section 4.2 on the *perfectum*). As in other ancient IE languages, the middle inflection is attested with two groups of verbs, that is, *media tantum*, which are traditionally labelled 'deponent' verbs in Latin linguistics (see Flobert 1975; Gianollo 2010), and oppositional middles. Unlike Ancient Greek, oppositional middles in Latin show a specialization in passive function from an early date (Clackson and Horrocks 2007: 25–26; see Pinkster 2015 for a general overview of voice alternations in Latin), while their use as anticausatives was much more limited (Cennamo et al. 2015: 683–704; Gianollo 2010, 2014; Inglese 2021).

As remarked above, however, the inherited medio-passive morphology in Latin was limited to the *infectum* system, while as we will see in Section 4.2 the *perfectum* featured a periphrastic construction. Hence, Latin featured a synthetic passive only for tenses based on the present stem. As an example, consider the passive form *amantur* 'are loved' in (8), in which an Agent phrase with *ab* + ablative also occurs (on the expression of the Agent in passive sentences see Luraghi 2010b: 44–50, 66–70).

(8)   *et*   *ab*   *eis*   *ita*   *amantur*
       and   by   3PL.ABL   thus   love:PRS.M/P.3PL
       '(Certain animals up to a certain time love their offspring,) and are so loved by them.'
       (Cic. *Amic.* 27)

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15 Tense-based distribution of voice morphology is typical of several verbs in Ancient Greek. According to Schwyzer and Debrunner (1959: 225), *activa tantum*, i.e. verbs that only or mostly show active morphology, tend to show middle morphology with active meaning in the future tense. On individual verbs see further Allan (2003: 209), Luraghi (2020: 199, 248–249, 253). Lühr (2012) discusses the case of the verb *pínō* 'drink', which, similarly to *édō* 'eat', consistently shows middle morphology and active meaning in the future.

2.5 Indo-Aryan

In Indo-Aryan, the passive function of the middle voice, though attested, is limited, and other strategies are preferred already at an early time (see Sections 3.2 and 4.3). The extent to which middle forms are used with passive meaning depends on the verbal stem: present, aorist, perfect and future.

According to Kulikov (2006), in forms based on the present stem passive use of the middle is limited to a handful of occurrences in the earliest books of the Rigveda. One of the forms he mentions is *mímīte* 'be measured' that can be interpreted as having passive meaning in three occurrences in RV 8.12.10, 8.12.11 and 8.12.13 (even though, remarkably, there are no agent phrases in these passages).

Among other occurrences of passive middles, the middle present *śúmbhate* from the root *śubh-* 'adorn' functions as passive in (9).

(9) *yā́bhir   mádāya   śúmbhate*
     REL.INS.PL   exhilaration:DAT   adorn:PRS.M/P.3SG
     'By whom he is beautified for exhilaration.'
     (RV 9.38.3)

Kulikov also mentions the comparatively frequent *stávate* 'is praised' from *stav-/stu-* which is commonly considered, along with *gr̥ṇīté* 'is invoked, is praised', a backformation from the stative form *stave* (Kümmel 1996: 135–136) and *-tundate* (attested in *ni-tundate*) 'be pushed'. In addition to this, the form *stuṣé*, also from the root *stav- /stu-*, is attested along with *gr̥ṇiṣé* from the same root as *gr̥ṇīté* as in (10).

(10) *índra   gr̥ṇīṣá   u   stuṣé*
     I.:VOC   invoke:PRS.M/P.2SG   and   praise:PRS.M/P.2SG
     'Indra, you are invoked and praised.'
     (RV 8.65.5)

The morphological status of both forms is disputed: they might be first or second person. Notably, while in the latter case the two forms would indeed have passive meaning, if they are taken as first persons then they must also be taken as having active meaning.[16]

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16 Jamison and Brereton (2014: 34) summarize the different interpretations as follows: "The morphological identity of the forms *gr̥ṇiṣé* and *stuṣé* is disputed. Ge[ldner] takes them as second sg. passives (favored also by Old[enberg]), though he mentions the possibility that they are first sg. *-se* forms in his n.; Lub[otsky] identifies them as first singulars. I take them as infinitives rather than first sg, primarily because they are accented. However, it is possible that a finite verb would bear the accent after the accented initial voc. *índra*, and that the second form would be accented contrastively, so first sg. is certainly not excluded. Since the 'you' of the publ. tr. (/ 'dich' of Ge[ldner]'s tr.) is not overtly expressed, either interpretation fits the text". To these, Kümmel (1996: 36) must be added, who takes the two forms as first person singular (hence both with active meaning).

Middle forms from sigmatic aorists may have passive meaning. An occurrence is *ásr̥kṣata* in (11).

(11)   *yát*   *pā́ñcajanyayā*   *viśā́*   *índre*   *ghóṣā*   *ásr̥kṣata*
        when   clan_five:INS   tribe:INS   Indra:LOC   cry:NOM.PL   send:AOR.MID.3PL
        'When cries were sent surging to Indra by the clan belonging to the Five
        Peoples.'
        (RV 8.63.7)

According to Kulikov (2006: 73), "there are also a few isolated occurrences of middle aorists of other morphological types found in passive constructions. These include a 3sg. form of the thematic aorist of *khyā* 'see, consider, reckon' (-*akhyata*) at RV 9.61.7 […] and a 3sg. form of the root aorist of *śā* 'sharpen' (-*áśīta*) at RV 1.57.2". The latter passage is given here as example (12).

(12)   *yát*   *samáśīta*   *haryatáḥ*   *índrasya*   *vájraḥ*
        when   whet:AOR.MID.3SG   enjoyable:NOM   I.:GEN   mace:NOM
        'When the enjoyable mace of Indra has been whetted.'
        (RV 1.57.2)

Outside the present and the aorist systems, for which other dedicated passive formations exist (see Sections 3.2 and 4.3), the middle can function as passive in the future and in the perfect, as noted in Burrow (1955: 295). Notably, not only is the future considered to be a late formation, it also features a passive participle, the so-called gerundive, that can replace the passive (see Section 4.3). A number of middle perfects might have originated from the stative, see Kümmel (1996: 9).

To sum up, while the middle can function as a passive in Vedic Sanskrit, other strategies are preferred, and even in later prose the extent to which the middle voice can express the passive remains limited, due to the extension of other strategies, as we will discuss especially in Section 4.3. Still, as we argue in Section 3.2, the middle endings remained associated with the passive function in Indo-Aryan, as the present passive always featured the middle endings with only a handful of exceptions.

2.6 Discussion

As we have shown in Section 2.2, the extent to which the middle voice extended to the passive function varies among the Indo-European languages. Zooming in on Ancient Greek, Indo-Aryan and Latin, we have observed three different situations, and these, as we argue below, were also followed by different developments. While in Greek the passive use of the middle voice did not cover the

majority of occurrences, but was clearly on the rise, in Indo-Aryan passive occurrences are marginal if not inexistent without additional marking (see Section 3.2). In Latin, on the other hand, the middle voice appears to be specialized for the passive function at an early stage already. Remarkably, Greek is the only Indo-European language that has preserved an inflectional middle up to today, with the percentage of passive occurrences steadily increasing over time. Indo-Aryan underwent a thorough change in its alignment system, partly connected with the widespread use of the periphrastic passive (Section 4.3). In Latin, an inflectional medio-passive was available only for part of the tenses, and left no traces in the Romance languages.

Historical data on the development of the Greek voice system shows that the association between middle forms and passive meaning remained constantly on the rise over time. A comparison of data from different language stages can illustrate this point. Even though the Modern Greek middle largely preserves the semantics of the Ancient Greek middle, token frequency shows a different distribution of the various meanings. In a corpus study comparing different stages in the history of Greek, Luraghi and Mertyris (2021) found that the percentage of passive middles increased dramatically from Homeric Greek to literary Modern Greek, passing from 19.6 to 63.9% (while reflexive/reciprocal/autobeneficiary and anticausative middles decreased from 38.3 to 12.1% and from 42.1–24% respectively).

Latin is also particularly instructive from a historical perspective. The voice system of Classical Latin underwent profound changes in Late Latin, and the inflectional medio-passive eventually disappeared. A number of factors contributed to the demise of the medio-passive from Latin to the Romance languages. Focusing on the passive function, the loss of the inflectional medio-passive resulted in the extension of the periphrastic passive construction, which in Latin was restricted to the *perfectum* (see Section 4.2), to the entire paradigm (on the grammaticalization of periphrastic passives in Romance see e.g. Cennamo 2006, 2019, 2020). Other functions of the medio-passive, notably the anticausative, ended up being increasingly associated with the reflexive pronoun *sibi/se*, as can be seen already in Late Latin, in which several verbs also show anticausative lability (Cennamo et al. 2015; Gianollo 2014).[17]

After the Vedic period, Indo-Aryan shows a stable situation for the present stem, with middle endings associated with the passive function in the dedicated derivational passive in *-ya-* (Section 3.2). In the other tenses, however, the passive

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17 The *media tantum* were also eliminated and new non-oppositional verbs showing reflexive morphology arose in the Romance languages, e.g. Lat. *irascor* 'be(come) angry' corresponds to Italian *arrabbiar-si* 'get angry' (Cennamo et al. 2015: 686–689, 693–703; Kemmer 1993: 151–182).

function of the middle voice remained limited on account of the ongoing replacement of past tenses (in the first place the aorist) and partly also of the future tense by non-finite verb forms, a development that eventually led to changes in the alignment system. We return to this issue in Section 4.3.

3 Morphological passives

Morphological passives are attested in Ancient Greek and in Indo-Iranian. In these languages, some verbal tenses display dedicated passive forms which feature a derivational suffix (typically a suffix for stative verbs). In Greek, such derivational passives are considered as being fully integrated in the verbal paradigm, while in descriptive grammars of Indo-Iranian, at least in the case of the present passive, they are kept apart as belonging to the group of derived inflections. To these, as further examples of morphological strategies being integrated into paradigms as passive markers, one can add the creation of a new preterite passive inflection out of the verbal adjectives in *-to- in Old Irish and the complex system of inflectional class change attested in Armenian and the rise of a new passive in -v- in Middle Armenian.

In this section, we discuss these formations, paying special attention to Greek (Section 3.1), Indo-Aryan (Section 3.2) Old Irish (Section 3.3) and Middle Armenian (Section 3.4). We compare and discuss the data from these languages in Section 3.5 (Classical Armenian, which shows a different scenario, will be treated further on in Section 5.3).

3.1 Ancient Greek

In Ancient Greek, the future and the aorist have separate passive paradigms. In both tenses, the passive is formed with the suffixes -$\bar{e}$- or -$th\bar{e}$-, and takes the active endings. The original meaning of these suffixes was not directly connected with the passive. Concerning the suffix -$\bar{e}$-, the general consensus is that it derived from the PIE suffix *-eh_1-/-h_1- of stative verbs (e.g. Beekes 2011: 256–257; Fortson 2010: 100; Rix 1992: 218; Ruijgh 2004; Sihler 1995: 497; Jasanoff 2004 reconstructs instead a suffix *-eh_1-ye/o- based on the ending of the instrumental case -eh_1-, not *-h_1 or -h_1-ye/o- and denies the possibility that the suffix of stative verbs was a source for the passive; see further the discussion in Haspelmath 1990: 51–52).[18]

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[18] According to some, this suffix might also have had an inchoative ('fientive') meaning, and indicate uncontrolled change of state (e.g. Harđarson 1998; LIV²: 25; Meier-Brügger 2010: 307); however, this view has been challenged by Jasanoff (2004).

The origin of the suffix *-thē-* must be sought in all likelihood within Greek. Both Chantraine (1961) and several other scholars have suggested re-segmentation of verbs that featured the suffix *-th-*, which possibly indicated change of state.[19] As Benveniste (1935: 196) pointed out, the re-segmentation process is not a result of chance: indeed, the Greek suffix *-th-* goes back to the PIE suffix **-dh,* which had a resultative meaning. Already Prévot (1935) called attention to the similarity between the aorist in *-thē-* and the presents in *-thō.* Benveniste (1935: 188–210), who has devoted a whole chapter to this suffix, showed that in the present the suffix *-th-* occurs with verbs that, in spite featuring active inflection, are "all intransitives and with a clearly middle meaning"[20] (1935: 194). He argues that the re-segmentation was semantically motivated, and writes that it "was not arbitrary. The aorist in *-then* is easily connected with presents in *-tho*, … By its own meaning the suffix *th-* had the tendency to be added to impersonal, intransitive or stative verbs, and convey a meaning similar to that of the medio-passive"[21] (1935: 196). Benveniste's analysis has been revived in a recent study by Magni (2010), who surveyed the existing literature, and argued that all meanings detected by Benveniste can be related as different in-stantiations of a basic inchoative meaning. Cognates of this suffix also occur in some resultative verbs in Indo-Iranian (Benveniste 1935: 193).

The suffix *-eh₁-/-h₁-* of stative verbs occurs in many ancient IE languages: for example, a number of second conjugation verbs in Latin feature this suffix, such as *iaceo* 'lie', *taceo* 'keep still', *sedeo* 'sit'. Elsewhere, too, the suffix adds a stative sense to the root: compare Lat. *sedeo*, *video* with OCS *sěděti*, *viděti*, from the PIE roots **sed-*, **u̯ei̯d-*, Hittite *marše-* 'be corrupted' (Watkins 1971: 74). A number of stative verbs with the same suffix derive from nominal bases, such as Lat. *rubeo* 'be red', *seneo* 'be old', and the very productive group of denominal verbs in *-eō* (from *-ēō*, e.g. *ánthos* 'bloom' : *anthéō* 'to bloom', aor. *anthēs(a)-*) in Greek (see Jasanoff 2004: 127–129). Most likely, this suffix is the same that also forms the present passive in Indo-Iranian, see Section 3.2, and possibly the Armenian *-i-*stems discussed in Section 5.3.

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19 Chantraine (1961: 168) explains the suffix as a combination of suffix *-ē-* with the suffix *-th-*, which occurs in aorists such as *éskhethon* 'I got, I held back' and possibly had a telic meaning (see also Risch 1974: 254). Similarly, Ruijgh (2004: 292–294) explains the suffix *-thē-* as a re-interpretation of the form *e-státh-ē-n* 'stood' (with root *sta-* plus extension *-th-*). For alternative explanations, see Rix (1992: 219–220), and Szemerényi (1996: 283 note 29 and the literature therein).

20 "[ces présents] sont tous intransitifs et de valeur nettement moyenne".

21 "… n'a pas été arbitraire. L'aoriste en -θην s'apparente bien au présent en -θω, … à lui seul, le suffixe -θ- tendait, de par sa valeur intrinsèque, a s'unir aux verbes impersonnels, intransitifs ou d'état et a convoyer une modalité voisine du medio-passif".

In Greek, it is remarkable that the increase in the number of verbs that show both active and middle morphology is parallel to the development of the use of the middle voice in passive constructions. This points to increasing grammaticalization of the active/passive opposition across the entire verbal system, and to a tendency of the middle voice to specialize as passive, which is also visible in other IE languages such as Latin and Gothic. However, the extent of this specialization in Greek remains lower, as the Modern Greek middle has indeed extended to passive function, but, as remarked in Section 2.6, has not lost the other functions of the Ancient Greek middle in spite of substantial limitation.

3.2 Indo-Iranian

Similar to Ancient Greek, Indo-Iranian also shows a dedicated passive formed with a derivational suffix. It is formed on the present stem plus the suffix *-ia-* (Sanskrit *-ya-*, Avestan *-iia-*, Old Persian *-ya-*) and it shows somewhat different features in Indo-Aryan and in the Iranian languages.

The most important difference between the two branches consists in the possible choice of ending: while in Sanskrit the *-ya-* passive consistently features the middle endings with only sporadic exceptions, in Iranian languages both middle and active endings occur. In particular, while Old Avestan takes middle endings, both active and middle endings are attested in Younger Avestan. Old Persian only features active endings (Beekes 1988: 188; Kellens 1984: 129; Skjærvø 2007, 2017: 532–533).[22]

As pointed out in Burrow (1955: 353) "the formation of the passive is closely connected with that of the fourth present class". Indeed, the fourth class features the same suffix, *-ya-* in Sanskrit, and, when inflected in the middle voice, it ends up being distinct from the passive only by the position of the accent. According to Burrow (1955: 354) the origin of the *-ya-* passive "was due to the frequency of intransitive verbs in that class [i.e. the fourth class], particularly with middle inflection: *jáyate* 'is born', *pácyate* 'becomes ripe, cooked', *tápyate* 'becomes hot', etc. Since a number of these verbs had differently formed transitive presents beside them (*tapati* 'heats', etc.) they could easily form the nucleus from which the passive system developed". According to Burrow, accent shift was introduced to distinguish between fourth class middles and 'real' passives.

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22 The medio-passive endings were likely becoming gradually dysfunctional in Iranian (note their complete disappearance in Middle Persian), in Old Persian they are sometimes used interchangeably with active forms (e.g. *abaranta* [3PL.IMPF.MID] ~ *abaran* [ACT] 'they brought (tribute)', *āhanta* [3PL.IMPF.MID] ~ [ACT] *āhan* 'they were').

This traditional view however seems to be based on a generalization that turns out to be unwarranted, at least in Vedic. Kulikov (2012: 400–406) discusses the -*ya*- forms of the verb *pac*- 'cook', and argues that this is virtually the only verb which does in fact feature passive and middle forms clearly distinguished by the position of the accent, with *pácyate* 'ripen' (anticausative) and *pacyáte* 'be cooked' (passive). For the verb *tápyate/tapyáte* 'become hot/be heated' according to Kulikov (2012: 380–390) accentuation does not provide clear evidence. Remarkably, passives and middles alternate with active forms of first class verbs, *pacati* 'cook' and *tapati* 'heat', which seem to function both as a counterpart for the middle (instantiating the anticausative alternation) and as base for deriving the passive. On the other hand, it is also remarkable that some non-passive -*ya*- verbs such as *mriyáte* 'dies' are unambiguously accented on the suffix (see the discussion and the references in Kulikov 2012: 179–181).

Several etymologies have been proposed for the suffix and are briefly reviewed in Kulikov (2012: 758–759), who is inclined to connect -*ya*- passives with -*aya*- causatives and writes: "Very attractive is Kortlandt's (1981: 127f.) hypothesis on the genetic relationship between Vedic *i*-aorists, -*áya*-causatives and -*yá*-passives: the former may go back to 'a deverbative noun of the type *k^wori* [> Ved. (*á*)*kāri* – LK], which could itself be used predicatively', whereas causatives and -*yá*-passives are supposed to be derivatives from this noun" (Kulikov 2012: 759).

The most widely accepted etymology of Sanskrit -*ya*- connects both the passive and the fourth class suffix to the PIE suffix *-*eh$_1$-/-*h$_1$*- of stative verbs that is also reflected in the suffix -*ē*- of the Ancient Greek passive aorist discussed in Section 3.1 and with Armenian intransitive -*i*- stems discussed in Section 5.3 (under this view, the preform of Sanskrit -*ya*- is more specifically -*h$_1$-yé/ó*-, see LIV[2]: 25). This etymology was proposed in Meillet (1900) and variously discussed by other scholars, among whom Cowgill (1983) and Harđarson (1998: 332–334) who offers an overview on this issue (see Section 3.1 for Jasanoff's 2004 critique). If accepted, this etymology has the merit of indicating a parallel development of the suffix in Greek and Indo-Iranian, as in both branches of Indo-European it has increasingly been integrated into the verbal paradigms to produce an inflectional passive. Note that the fact that in Iranian -*ia*- passives may feature the active endings supports the assumption of a parallel between the Greek and the Indo-Iranian formation. However, in Indo-Iranian one cannot disconnect the -*ia*- passive from fourth class verbs, as argued above. As shown in Kulikov (2012) non-passive -*ya*- presents in Vedic basically show the same semantics as *media tantum* in the other ancient IE languages. Hence, the generalization of the suffix as a marker of passive voice must be viewed as a development which took place inside the fourth class presents.

A parallel to the Indo-Iranian situation might be viewed in conjugation class alternation between -i- (intransitive, anticausative and passive) and -e- stems (transitive and active) in Armenian (see Section 5.3). If one accepts the etymology that connects Sanskrit -ya- with Armenian -i-, then voice opposition might have originated as conjugation class change in both branches of Indo-European. Later, as an Indo-Iranian development, the -ya- passive became disconnected from fourth class verbs to the extent that grammarians analyzed it as a secondary conjugation on its own, which constituted a true dedicated passive.

Beside the suffixed passive formed on the present stem, Indo-Iranian languages also have dedicated passive forms in the aorist. The paradigm of the passive aorist is defective, and it is basically limited to third person singular forms with the ending *-i (see Kümmel 1996: 14 for the formation of the stem) and plural in -ram/ran[23] (Kümmel 1996: 15–16). The reason for discussing this form here is that the most likely etymology connects the ending with a nominal suffix that also occurs in adjectives such as Ancient Greek *tróphis* 'grown'. Kümmel (1996: 15) defines such adjectives as 'resultative'.

3.3 Old Irish

As already remarked in Section 2.2, Old Irish displays a distinction between the deponent and the passive inflection, both in the present and in the preterite. While the passive present is a direct outcome of the PIE middle, the preterite passive is a new formation that deserves special attention. According to Thurneysen (1998: 437) "in Irish and Britannic the stem of the passive preterite corresponds to the Indo-European verbal adjective in -to-, -tā-, which was once used, as in Italic (Lat. *captus*, -a, -um est) to supply this tense-form. But in Irish the forms are felt entirely as verbs; compounds take the verbal, not the substantival stress" (see further Cowgill 1983: 104; McCone 2005: 231–236; Watkins 1969: 16).

According to McCone, the situation is slightly different from the Latin one, as the passive participles never gave rise to a periphrastic formation proper, because the copula was consistently omitted. The predicative passive participle, being in origin a nominal form, could only express a number distinction of singular versus plural in the third person, cf. the forms *do:breth* 's/he was carried' versus *do:bretha* 'they were carried'. In order to express distinctions in person as well, infixed pronouns were attached to the participle: *do-m:breth* 'I was carried', *do-t:breth*

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23 The ending -ram/ran also occurs in the third plural imperfect of the stative/middle diathesis, which may speak for a historical relationship between this ending and the middle endings in -r, cf. Kümmel (1996: 20).

'you were carried', thereby giving rise to a full-fledged inflectional paradigm in the preterite.[24] Notably, the infixed pronoun is the object pronoun in Old Irish: thus, the passive originated out of an impersonal form, as remarked in Watkins (1969: 15).

3.4 Middle Armenian

While Classical Armenian does not consistently differentiate active and passive morphology (cf. Sections 4.6 and 5.3), roughly from the tenth CE onward, Middle Armenian attests to a passive formed with the suffix -v- which can be attached to present and aorist stems (Karst 1901: 292–298), cf. the presents *asem* 'I say' : *as-v-i* 'is said', *əndunim* 'I accept' : *əndun-v-i* 'is accepted', *banam* 'I open' : *ban-v-i* 'is opened', *t'oɫum* 'I allow' : *t'oɫ-v-i* 'is allowed' and aorists such as *bac'-v-aw* 'was opened'. Karst (1901) takes -v- to be identical to the morpheme /u~v/ forming present stems, e.g. *gel-u-* 'to turn' (cf. Lat. *vol-v-ō*), to which the medio-passive marker -i- as in *ber-i-m* 'I am carried' was added. In the sequence *-vi-* /v/ was then reanalysed as a passive morpheme. Alternatively, one may assume that this formation developed out of the aorist allomorph *tu-* (PIE *deh₃-) of *tam* 'to give' found e.g. in 1SG AOR ACT *etu* 'I gave' and in 3SG AOR PASS *tvaw* 'was given' (marked with the medio-passive stem -*a*- and ending -*w*) beside 3SG AOR ACT *e-t* 'gave' < *édeh₃t) to which a new present *tvi-* 'be given' was formed. The opposition PRS *t-a-* (ACT/PASS) : *t-v-i-* then served as the model for the expansion of -v- as passive marker.

3.5 Discussion

In Sections 3.1–3.3 we have discussed the use of dedicated passive morphemes which have been co-opted as passive markers but had in origin different functions. The Ancient Greek and the Indo-Iranian passives are similar, as they both feature a suffix that was derivational in origin and became a distinctive marker of the passive stem. Differences concern the connection with specific tenses/aspects: the aorist in Greek and the present in Indo-Iranian, and partly the choice of inflectional endings, which are invariably active in Ancient Greek, while they are almost invariably middle in Indo-Aryan. In this respect, Iranian languages attest to an in-between situation, as they feature both middle (Old Avestan) and active endings

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24 Remarkably, once the PIE verbal adjectives became integrated into the verbal paradigm as preterite passive forms, a new passive participle was created by adding the suffix *-yo/ā- to the preterite passive stem (Thurneysen 1998: 441–443).

(Old Persian, with Younger Avestan showing both active and middle forms). The latter two languages might reflect the original Indo-Iranian situation, hence pointing to a closer parallel with Greek. In fact, the Greek and the Indo-Iranian formations might be even more strictly related if one accepts the etymology that connects both the Greek -th-$\bar{e}$-, - $\bar{e}$- and the Indo-Iranian -ia- suffixes with the PIE stative suffix *-eh_1-/-h_1- of stative verbs. As we will argue in Section 5.3, the same suffix might possibly lie at the base of conjugation class alternation in Classical Armenian.

The much later Irish suffix had a different origin and represents the outcome of a grammaticalization process, whereby a nominal form of the verb, a participle, was reanalyzed as a finite verb form and acquired agreement markers through the addition of prefixed personal pronouns. The Irish passive started out as a periphrastic formation similar to those that we discuss in Section 4 (even though opinions differ as to whether it ever contained an auxiliary, see Section 3.3). Then the participle was generalized as past passive form: until this stage, the development is similar to the development that we will illustrate for Indo-Aryan in Section 4.3. The addition of pronominal prefixes then turned the nominal verb form into a full-fledged finite verb form.

Finally, the Middle Armenian suffix -v- exemplifies still another morphological process, that is, the re-segmentation of a suffix that originally had a different function, and was then reanalyzed as marker of the passive and extended as such to verbs to which it did not belong originally.

If we turn now to the question of the stability of these morphological passives over time, even some brief remarks allow us to point out interesting developments. In general, morphological passives surveyed in this section remained stable for long time spans, and their obsolescence is connected with wider processes of restructuring in the verbal systems. In Ancient Greek, the -th-$\bar{e}$-/- $\bar{e}$- suffix extended to the future, in which a new passive appeared already in Homer with two occurrences (see Allan 2003: 181), and extended in Classical Greek. Contrary to the aorist, the passive future features middle endings. Both formations were well integrated into the verbal paradigms: in the Koiné, in the wake of the Hellenistic era (after the fourth century BCE), passive aorist forms increasingly replaced middle aorist forms (see Horrocks 2010: 103). During the Middle Ages, the passive and middle aorist merged with the perfect (Horrocks 2010: 302–303), and new passive endings emerged, based on the -k perfect but still preserving the -th- passive suffix. As a result, in Modern Greek the perfective passive has a dedicated set of endings different from the active endings, and also features a different stem, with a -th/t- suffix (Holton et al. 1997: 146–159; Schwyzer 1953: 764). The synthetic future was increasingly replaced by periphrastic forms with various auxiliaries. Notably, according to Horrocks (2010: 117) the Koiné favored avoidance of the

passive future which was replaced by a periphrasis with *méllō* 'be about to' plus the passive aorist, hence attesting to the productivity of the latter form until a comparatively late stage in the history of Greek.

The Indo-Aryan present passive also survived in the Middle Indo-Aryan Prakrits (see Bubenik 1998: 118–121) with the suffix *-ya-* having changed to *-ijja-* (*kijjai* 'is done', corresponding to Sanskrit *kriyate*), with the active endings that were sometimes also found in Classical Sanskrit at a late stage (Burrow 1955: 355). Various phonological changes partly reshaped the complex suffix plus ending, resulting in a higher morphological integration of the two morphs, which are in several cases no longer analyzable as such, see for example *hammanti* 'they are killed' from *han-* 'kill' (the Sanskrit *-ya-* passive is *han-ya-nte*). Only from the twelfth century CE onward did the new analytical passive with the auxiliary *jānā* 'go' characteristic of the New Indo-Aryan languages start to consistently replace the old synthetic passive (Bubenik 1998: 125–126).

The Irish and the Armenian morphological passives described in Sections 3.3 and 3.4 are much later, and, at least for Armenian, an earlier stage is well documented and will be discussed in Section 4.6. We still decided to include them in order to show more possible sources of passive markers. Concerning their stability over time, they show a different picture. In Irish, reflexes of the old passive are still to be found today, but only one form survives, the so-called autonomous form, with no number distinctions and no personal affixes. According to Stenson (2020: 127–128) "[t]his is an impersonal form, used when the subject of a verb is unknown or unimportant", and while historically originating from a passive, "in contemporary Irish, [it] differ[s] in several ways from passive forms of English and many other languages". Conversely, the Middle Armenian passive, roughly contemporary to the Old Irish one, extended to all verbal paradigms and still remains in Modern Eastern Armenian, in which we find for example *tesnel* 'to see' versus *tesnvel* 'to be seen' *kardal* 'read' versus *kardac'-v-el* 'be read'; *grel* 'write' versus *gr-v-el* 'be written' (see Dum-Tragut 2009: 175–177).

4 Participles and periphrastic constructions

Ancient IE languages attest to nominal forms of the verb, participles and verbal adjectives that may have a passive orientation when based on transitive verbs, that is, they may profile the event encoded by the base verb from the perspective of the Patient or P-participant. Notably, though the details of the morphological shape and the semantics of these morphemes differ in the IE languages, most of these forms, e.g. *-nt-* participles, *-to-*, *-no-*, and *-lo-* verbal adjectives, can be traced back to PIE (see Adrados et al. 2016: 369–375; Beekes 2011: 279–280;

Fortson 2010: 108–109; Meier-Brügger 2010: 317–320, 421). It must be stressed that in the system of the proto-language these 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. Accordingly, the *-nt-* and the *-to-* suffixes were used to derive verbal adjectives from verb bases and were originally indifferent to voice distinctions (Melchert 2017; Szemerényi 1996).

In IE languages in which the inherited medio-passive morphology was used to encode passive voice only to a limited extent, P-oriented nominal forms of the verb could variously fill this gap by giving rise to periphrastic formations when used predicatively in combination with auxiliary verbs such as 'be' (this pattern can possibly be projected back to PIE already, cf. Drinka 2009; Kümmel 2020: 31).[25] In the remainder of this section, we survey the use of periphrastic passive constructions in Hittite, Latin, Slavic, Indo-Aryan, Germanic, and Armenian in which the use of such forms was quite systematic. Notably, given the resultative semantics of certain participial forms, it is unsurprising that they could sporadically be used in passive function in other languages as well. For instance, in Ancient Greek the medio-passive perfect participle combined with the copula *eimí* could also have a passive interpretation (cf. Bentein 2016: 107–110, 125–130; on participles and the encoding of the passive voice in Greek see also Napoli 2017 with further references). In other IE languages, participles with passive meaning are also attested in Tocharian (Krause and Thomas 1960: 156–158; Malzahn 2010: 232), Old Irish (Thurneysen 1998: 441–443), and Albanian (Rusakov 2016: 584).[26] In Armenian, one finds a participle in *-eal*, which, as is common for non-finite forms of the Armenian verb, is syntactically labile (Sections 4.6 and 5.3), and can be used in a periphrastic construction with the verb 'be' in passive function (Jensen 1959: 114; Schmitt 1981: 152–153).

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25 For a typology of periphrastic, or auxiliary-verb constructions see Anderson (2006). On passive participles in cross-linguistic perspective see further Haspelmath (1994).

26 The situation of Tocharian is admittedly more complex. Tocharian attests to different participial formations. In the present, one finds both 'active' participles in *-ñca* (TochB.)/*-nt* (TochA.) and 'middle' participles in *-mane* (TochB.)/ *-mäm* (TochA.), but the two are semantically equivalent, and 'middle' participles never have a passive reading (Pinault 2008: 616–618; on *-nt-* participles see also Fellner 2014 with references). In the preterite, a single participial formation in *-u* is attested (Krause and Thomas 1960: 156–157; see Saito 2006 for a thorough treatment), which is syntactically indifferent to diathesis (Pinault 2008: 616; Saito 2006: 64–68), and can also have a passive interpretation in specific contexts.

4.1 Hittite

As we have already observed in Section 2.2, in Old Hittite the inherited medio-passive voice was employed as a passive marker to corresponding active verbs only in a limited number of cases, with most oppositional middle verbs being anti-causative in function (cf. Hoffner and Melchert 2008: 302–305; Luraghi 2012; Neu 1968: 109–115). It is only in New Hittite that the passive function of the middle becomes more common (cf. Inglese 2020: 221).

Since Old Hittite a construction involving predicative participles with the verb *eš-* 'be' was used to express the passive of active transitive verbs. Hittite displays a single participial formation in *-ant-*, cognate with **-nt-* participles of other IE languages (Frotscher 2013; Kloekhorst 2008), attested both for the *ḫi-* and for the *mi-*inflecting verbs (Frotscher 2013: 153). The meaning of the participle partly depends on transitivity, and for intransitive verbs, also on lexical aspect of the base verb (see Inglese and Luraghi 2020 for discussion with further references).

Leaving intransitive verbs aside, the participle of transitive verbs in Hittite displays passive orientation, and indicates a state (mostly ensuing from a change-of-state event) from the perspective of the P-participant.[27] When used predicatively with the verb *eš-* 'be', the participle and the verb can be described as forming a complex passive periphrastic construction (Inglese and Luraghi 2020; note that in the present tense the verb 'be' is most often omitted, as in [13], cf. Cotticelli-Kurras 1991).[28] The Hittite periphrastic passive construction is shown in example (13), in which the passive interpretation of the construction is further confirmed by the occurrence of the agent phrase *šiunit* 'by the god(s)' (Frotscher 2013: 288–290; Hoffner and Melchert 2008: 304).

(13)   ᴳᴵˢ̌TUKULᴴᴵ·ᴬ-*iš=wa=tta*   *šiunit*   *piyanteš*
        weapon:NOM.PL=QUOT=2SG.DAT   god:INS   give:PTCP.NOM.PL
        'The weapons are given to you by the Gods.'
        (KBo 22.6+ i 25 OH?/NS)

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27 Lexical aspect plays a limited role in this picture, as participles of both telic and atelic transitive verbs are usually P-oriented and thus passive, as shown by comparison between *kuen-* 'kill' > *kunant-* 'killed' and *šākk-* 'know' > *šākkant-* 'known', but sporadically also 'knowing' (see further Dardano 2014).

28 The Hittite periphrastic passive partly overlapped with so-called 'stative' periphrases involving a participle and the verb *eš-*, and in some cases is only the context that allows disambiguation between a stative or a passive eventive reading (Hoffner and Melchert 2008: 304; Inglese and Luraghi 2020 with references). The same difficulties arise in the interpretation of potential examples of periphrastic passives in Luwian (see Giusfredi 2020: 136–138). This polysemy is typical of periphrastic passives built on resultative/stative participles (cf. Abraham 2006; Haspelmath 1990).

It should be remarked that in Hittite the periphrastic passive and the passive use of the inflectional middle essentially overlap in their distribution, as they can be used both in all tenses (present and preterite) and moods (indicative and imperative). Both constructions can also apply to the same verb, so that it is extremely difficult to detect a functional difference between the two strategies (see Inglese 2020: 157–159). Compare the passive middle *tarnattari* 'will be released' in (14a), which is functionally equivalent to the periphrastic passive *tarnan ešdu* 'let it be permitted' (14b), both passives of active *tarna-* 'release, allow'.[29]

(14) a. EGIR-*an=at=kan*   *tarnattari*
        back=3SG.NOM.N=PTC   release:PRS.M/P.3SG
        '(If there is no male heir), it [i.e. the property] will be released.'
        (KBo 4.10 obv. 11, NH/NS)

     b. *nu=war=at=mu=kan*   *parā*   *tarnan*   *ešdu*
        CONN=QUOT=3SG.NOM.N=1SG.DAT=PTC forth   release:PTCP.NOM.N   be:IMP.3SG
        '(On this tablet these words are not to be found), so let it be permitted for me.'
        (KUB 26.1+ iv 51, NH/NS)

4.2 Latin

As we remarked in Section 2.5, the use of the inherited PIE medio-passive to encode passive function in Latin was restricted to forms of the *infectum*. The *perfectum* features a periphrasis based on the past participle in *-tus*, from the PIE verbal adjective suffix *-*to*- (Fortson 2010: 109; Weiss 2009: 437–443) and the verb *sum* 'be'.[30] The tense-based split between synthetic and analytic passive constructions is regular and pervasive throughout the verbal system of Latin (cf. Palmer 1954 among others; see Embick 2000 for a formal account), an innovation shared by Sabellian languages (cf. Clackson and Horrocks 2007: 26).

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29 Due to the nature of the Hittite corpus, it is difficult to find fully equivalent middle and periphrastic forms in passive function with the same verb. In the case of *tarna-* in (14), imperative forms of the synthetic middle are not attested, but occurrence of middle forms of this verb are in general very few, so this might be a coincidence (notably, imperative middles are well attested for other verbs, e.g. *lattaru* 'let it be released'). A full-scale contrastive study on the distribution of synthetic and periphrastic passives in Hittite texts is needed to fully clarify this point, but it clearly lies outside the scope of this paper.

30 Similarly to what discussed for Hittite (note 28), beside the dynamic passive reading, the construction with the perfect participle plus the verb 'be' could also have a resultative-stative or a stative interpretation (cf. Cennamo 2006: 315).

As an example, compare the passive forms of *amo* 'love' in examples (8) and (15). In (8), the present morphological form *amantur* 'are loved' is used. By contrast, in (15) the passive of *amo* in the *perfectum* is expressed by the periphrastic construction *amata sum* 'I was loved'.

(15) *nihilo   ego   quam nunc tu   amata   sum*
nothing 1SG.NOM than   now 2SG.NOM love:PPP.F be:PRS.1SG
'No less than you are now, was I once beloved.'
(Pl. *Mos*. 1.3)

Remarkably, the same distribution characterizes deponent verbs (which show middle morphology), which build their *perfectum* inflection with a periphrastic construction, e.g. *loquitur* '(s)he speaks' but *locutus est* 'he spoke', *orior* 'I stand up' / *ortus sum* 'I stood up'. As the examples show, deponent verbs are not necessarily transitive: this means that the past participle in such cases cannot be said to have active meaning. In fact, all intransitive verbs may have so-called 'impersonal' passives, such as present *itur* 'one goes, there is going', *pugnatur* 'one fights, there is fighting' perfect *itum est* 'one went', *pugnatum est* 'there was fighting', hence the possibility for a verb to have a past participle does not depend on transitivity.

Interestingly, the Latin periphrastic passives remained confined to a sub-set of the inflectional paradigm. As a result, the Latin system featured a systematic split between synthetic forms in the *infectum* and analytic forms in the *perfectum*. In Romance languages, the periphrastic passive eventually gained ground and replaced the synthetic Latin passive throughout the paradigm, a process which had possibly already started in Late Latin (Cennamo 2006, 2020; Pinkster 2015: 257).

4.3 Indo-Aryan

Besides the wealth of participles based on the different aspectual stems, Indo-Iranian languages also feature the so-called past passive participle (PPP), a verbal adjective which is S-oriented with intransitive verbs and P-oriented with transitive verbs. Like similar verbal adjectives or past participle cross-linguistically (see Haspelmath 1994), the Indo-Iranian PPP indicates a state of the subject with intransitive verbs, as with *gata-* 'gone' from *gam-* 'go' in (16).

(16) *púnas   tā́n   yajñíyā   devā́   nayantu   yáta*
again   DEM.ACC.PL sacred:NOM.PL god:NOM.PL lead:IMP.3PL where
ā́-gatāḥ
PREV-go:PPP.NOM.PL
'Let the gods worthy of sacrifice lead those back again whence they came.'
(RV 10, 85, 31)

The PPP of transitive verbs is P-oriented: *kṛta-* 'made' from *kṛ-* 'make', *hata-* 'killed' from *han-* 'kill'. While with intransitive verbs the participle agrees with the subject, as shown in (16), with transitive verbs it agrees with the P participant, which then functions as subject of a passive construction, as in (17).

(17)   *tatám*   *me*   *ápas*   *tád*   *u*
       stretch:PPP.NOM.N   1SG.GEN   work(N):NOM   DEM.ACC.N   PTC
       tāyate   *púnaḥ*
       stretch:PRS.PASS.3SG again
       'My [ritual] work has been performed and it is being performed again.'
       (RV 1.110.1)

The PPP, which is formed from the zero or reduced grade of the stem with the suffix *-ta* or, less frequently, *-na* (the latter suffix is no longer productive in Iranian), could also occur with the verb 'be' (*as-* or *bhu-*) as in (18).

(18)   *yuktás*   *te*   *astu*   *dákṣinaḥ*
       yoke:PPP.NOM 2SG.GEN   be:IMP.3SG   right:NOM
       'Let your right (horse) be yoked.'
       (RV 1.81.5)

Etymologically, the PPP is cognate of the Latin *-to-* past participle (Section 4.2) and of the Slavic *-(e)n-/-t-* past passive participle (Section 4.5), and goes back to the PIE **-to/-no* verbal adjective. Contrary to Latin and Slavic, however, in Indo-Iranian the PPP did not become fully integrated as a participle in the verbal paradigms. As observed by Lowe (2015: 16), the PPP is better regarded as a verbal adjective as opposed to participles that he views as adjectival verb forms, even though, already in Vedic, the PPP could function as a verb, as in (17), in which the PPP *tatam* '(was/has been) performed' is parallel the finite verb form *tayate* 'will be performed'. Lowe (2015: 257) also shows that the PPP could share the distribution of 'real' participles, as in (19) and (20).

(19)   *ā́*   *ródasī*   *apṛṇā*   *jā́yamānah*
       prev   world:ACC.DU   fill:IMPF.2SG   be_born:PTCP.PRS.M/P.NOM.SG
       'You filled the two world-halves when you were born.'
       (RV 3.6.2)

(20)   *jātá*   *apṛṇo*   *bhávanāni*   *ródasī*
       be_born:PPP.NOM   fill:IMPF.2SG   creature:ACC.PL   world:ACC.DU
       'When you were born you filled the living world (and) the two world-halves.'
       (RV 3.3.10)

While in Early Vedic verbal use of the PPP remains limited, it started extending already in Vedic prose and then kept extending thereafter. Similarly, another non-finite form, the so-called gerundive or future passive participle, also became increasingly used over time. In Early Vedic, it can be formed with a number of suffixes, including *-āyya* (limited to the RV), *-enya*, *-ya*, *-tva* which likewise disappear after the Vedic period, and *-tavya*, *-anīa*, not attested in the Rig Veda, which are the only gerundive suffixes that remain in post-Vedic Sanskrit. An example is (21):

(21)   *yá*   *éka*   *íd*   *dhávyah*   *carṣaṇīnā́m*
       REL.NOM   one:NOM   PTC   invoke:GERV.NOM   mortal:GEN.PL
       '(He) who alone must be invoked by mortals.'
       (RV 6.22.1)

This form shares the morphosyntactic behavior of the PPP, and is S-oriented with intransitive verbs and P-oriented with transitive verbs (see Hock 1986).

    The extension of these two constructions eventually led to the rise of a split ergative system that characterizes part of the modern Indo-Aryan languages, and whose development can be observed in Middle-Aryan (see Bubenik 1989; Stronsky 2011). The development is especially clear already in post-Vedic Sanskrit, in which the *-ta* participle tended to replace finite tenses starting with the aorist both for intransitive and for transitive verbs, hence resulting in an over-extension of the passive construction which was later reanalyzed as ergative.

4.4 Germanic

Germanic languages attest to different strategies for the encoding of the passive voice. As we have already remarked in Section 2.2, Gothic is the only Germanic language to have inherited finite forms of the verb going back to the PIE middle with passive function. Most Germanic languages have completely lost the PIE middle inflection and express the passive through periphrastic constructions involving the past (passive) participle and various auxiliaries (cf. Ramat 1981: 155). Moreover, North-Germanic languages have created a new passive inflection through grammaticalization of the Proto-Germanic reflexive pronoun **sik* (cf. Hilpert 2011; see also Cennamo et al. 2015: 704–707).

    Similarly to Latin, Gothic displays a tense-based split concerning the encoding of the passive voice. As we illustrated in Section 2.2, the inherited middle remains, and is limited to passive function, in the present and in the optative. Elsewhere, the passive is expressed through the combination of the past participle and past forms

of either *wisan* 'be' or *waírþan* 'become', as in examples (22a) and (22b).[31] That these forms are passive in function is further confirmed by the occurrence of the agent phrase *fram Iōhannē* 'by John' in (22a). Notably, Gothic behaves differently from Latin, where periphrastic passive forms in the *perfectum* select present finite forms of *sum* 'be'.

(22) a. *qam*   *Iēsus*   *jah*   *dáupiþs*   *was*
          come:PST.3SG   J.:NOM   and   baptize:PTCP.PST.NOM be:PST.3SG
          fram   *Iōhannē*
          from   J.:DAT
          'Jesus came and was baptized by John.'
          (Mark 1.9)
      b. *sabbatō*   *in mans*   *warþ*   *gaskapans*
          sabbath:NOM   in man:GEN   become:PST.3SG make:PTCP.PST.NOM
          'The sabbath was created for man.'
          (Mark 2.27)

The choice of different auxiliary verbs is possibly linked to different aspectual nuances. Periphrastic passives built with *wisan* 'be' are often interpreted as expressing a state (*Zustandspassive* in the German grammatical tradition), whereas forms built with *waírþan* 'become' are associated with an eventive passive (*Vorgangpassive*) reading (see Jones 2009: Ch. 9; Krause 1968: 221). In support of this aspectual distinction, one can observe that *wisan*-passives usually translate Greek perfect passives, whereas *waírþan*-passives are used to translate the Greek aorist passive (Lehmann 1994: 36). This difference, which is however already partly blurred in Wulfila's translation of the Bible (Krause 1968: 221), follows from the different lexical meaning of the auxiliaries, and this is suggestive of a relatively high degree of semantic compositionality of these constructions. In fact, some scholars take this as evidence of a low degree of grammaticalization and paradigmatic integration of periphrastic passive forms in Gothic (Lehmann 1994: 36). Similar observations can be broadened to other early Germanic languages such as Old English and Old High German (see Mailhammer and Smirnova 2013 and references therein), suggesting that the grammaticalization of periphrastic passive constructions in Germanic languages was only at its onset in the earlier textual sources.

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31 Gothic participles are inherited from PIE (Krause 1968: 229). Strong verbs form their participle with a suffix *-ana-* (partly *-ina-*), which continues PIE *-*ono*-. Conversely, the participle of weak verbs historically derives from PIE verbal adjectives in *-*to*-. In Gothic, the suffix shows up in three variants *-ta-*, *-da-*, and *-þa-* (cf. Braune 2004: 76–77). On the inflection of the participle see also Braune (2004: 122–123).

4.5 Slavic

Already at the time of the first written sources, Slavic languages show no trace of the PIE morphological middle, which is likewise unattested in the closely related and much later documented Baltic languages (cf. e.g. Stang 1942: 224, 1966: 405). In Old Church Slavic (OCS), the passive was encoded by a periphrastic formation containing the verb 'be' and the past passive participle in -*t*-, -*n*- or -*en*-. The participle is cognate with the Indo-Iranian so-called past perfect participle in -*ta*- or -*na*- that has been discussed in Section 4.3 and with the Latin past participle in -*to*- (Section 4.2). Contrary to the Latin participle, which can also be formed from intransitive verbs, and which even had active meaning with intransitive deponent verbs, the OCS past passive participle is only formed from transitive verbs, hence it always only functions as passive. The OCS passive is exemplified in (23) with the passive participle *viděnъ* 'seen', featuring the suffix -*n*, and (24) with the passive participle *vъzęto* 'taken', formed with the suffix -*t*.

(23) *oni*   *že*   *slyšavъše*   *ěko*   *živъ*
      DEM.NOM.PL   PTC   hear:PTCP.PST.NOM.PL   that   alive:NOM
      estъ   *i*   *viděnъ*   *bystъ*   *ejǫ*
      be:PRS.3SG   and   see:PTCP.PST.PASS.NOM   be:AOR.3SG DEM.INS.SG.F
      ne   *jęsę*   *věry*
      NEG   take:AOR.3PL   faith:GEN
      'And they having heard that he was alive and had been seen by her did
      not believe.'
      (Mark 16.11)

(24) *a*   *otъ*   *ne*   *imǫštaago*   *i*   *eže*
      but   from   NEG   have:PTCP.PRS.GEN   and   REL.ACC
      ašte   *mъnitъ*   *sę*   *imy*
      ever   believe:PRS.3SG   REFL   have:PTCP.PRS.NOM
      vъzęto   *bǫdetъ*   *otъ*   *nego*
      take_away:PTCP.PST.PASS.NOM be:FUT.3SG   from   DEM.GEN
      'But from him who has not shall be taken away even that which he
      thinks he has.'
      (Matt. 25.29)

In much the same way as several other Indo-European languages of Europe, Slavic languages developed a reflexive middle, which in OCS features the reflexive particle *sę* (cf. Malicka-Kleparska 2016). Occasionally, the reflexive middle could have passive function (Lunt 2001: 161), as in (25).

(25) | *gore* | *že* | *člověku* | *tomu* | *imъže* | *synъ* | *člověčьskъ* |
|---|---|---|---|---|---|---|
| woe | PTC | man:DAT | DEM.DAT | REL.INS | son:NOM | man(POSS.ADJ):NOM |

prědastъ	*sę*
betray:PRS.3SG	REFL

'But woe unto that man by whom the Son of man is betrayed!'
(Matt. 26.24)

4.6 Armenian

Classical Armenian has a periphrastic construction in the perfect and pluperfect formed with the participle in *-eal*[32] and the present and imperfect tense of the copula *em* 'I am'. The participle in these constructions functions only partially like the participles in Hittite, Latin, Germanic and Indo-Aryan discussed in Sections 4.1–4.4. Indeed, the Armenian participle is S-oriented with intransitive verbs (as e.g. in *gam* 'come' : *x*[NOM] *ekeal ē* (suppletive) '*x* has come') and P-oriented with transitive verbs. In the latter case, the construction has a passive reading in the absence of an A argument, as e.g. in *tesanem* 'see' : *x*[NOM] *teseal ē* '*x* has been seen', cf. the pluperfect of *hatanem* 'to cut' in example (26):

(26) | *hateal* | *ēr* | *kʻown* | *y-ačʻacʻ* | *imocʻ* |
|---|---|---|---|---|
| cut:PTCP | be:IMPF.3SG | sleep:NOM | from-eye:ABL.PL | my:ABL.PL |

'Sleep departed ["was cut off"] from my eyes.'
(Gen 31.40)

In contrast to this, transitive perfects have genitive subjects (Kölligan 2013), as shown in example (27).

(27) | *zayn* | *owrowkʻ* | *teseal* | *icʻē* |
|---|---|---|---|
| DEM.ACC | anyone:GEN | see:PTCP | be:SBJV.PRS.3SG |

'(Can one say that) anyone has seen it?'
(Eznik §124)

Notably, the genitive NP has been shown to have subject properties, such as coreferential deletion and control of reflexive pronouns (Kölligan 2013: 75–77).

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32 The participle inflects as an *o*-stem (e.g. gen. sg. *bereloy*) which makes a connection with PIE **-lo-* likely; this suffix is used with participial function in the Slavic periphrastic perfect and as a gerundive in Tocharian B *-lle*, A *-l < *-li̯o-*; since the participle is usually derived from the aorist stem of the verb, e.g. prs. *hatanem* 'I cut' : AOR. *hat-i*, PTCP. *hat-eal*, the element *-ea-* may be related to the productive aorist stem formation in *-eacʻ-*, e.g. *gorcem* 'I work' : *gorc-eacʻ* '(s)he worked'. See also Kölligan (2013: 83–84).

This has been taken as evidence for split alignment, rather than passive (see Bubenik 1997: 75–79; Scala 2009; for the passive interpretation see Benveniste 1952; Meillet 1936 who consider the genitive NP a possessive agent).

Occasionally, periphrastic constructions involving various auxiliaries occur in cases in which the morphology does not differentiate voice. In the first place, with verbs that do not encode active/passive alternation through *e/i*-alternation in present stems (see Section 5.3) one sporadically finds a periphrasis involving a verbal adjective and auxiliaries such as *linim* 'be, become' or *kam* 'stand, be, become' as shown for the verb *koxe-* 'trample under foot' in (28) and (29).

(28) *zi*   *mi*   *aṙ*   *otn*   *koxicʻen*   *znosa*
      that   NEG   under   foot   trample:SBJV.PRS.3PL   3PL.ACC
      'Lest they trample them under (their) foot.'
      (Matt 7.6)

(29) *srbutʻiwnn*   *kayr*   *koxan*   *yordwocʻn*
      holiness:NOM.DEF   stand:IMPF.3SG   trampled   from_son:ABL.PL.DEF
      aylazgeacʻ
      foreign:GEN.PL
      'The sanctuary was trodden down by the sons of foreigners.'
      (1 Macc 3.45)

Non-finite forms do feature voice distinctions: for example, the infinitive *paštel* means both 'to serve' and 'to be served' (see Section 5.3). In (30) the ambiguity is resolved by using the periphrasis *paštōn aṙnul* 'to receive service = to be served' versus *paštel* 'to serve'.

(30) *očʻ*   *ekn*   *paštōn*   *aṙnul*   *ayl*   *paštel*
      NEG   come:AOR.3SG   service   take:INF   but   serve:INF
      '(The son of man) has not come in order to be ministered unto, but in order to minister.'
      (Matt 20.28; cf. the Greek version with a passive infinitive *ouk êlthen diakonēthễnai* [serve:AOR.INF.PASS] *allà diakonễsai*).

The imperfect has only one set of endings for both active and passive constructions; in the case of *lsem* 'hear', impf. *lsei* 'I heard', etc., the synthetic form is mostly used in active clauses, while the anticausative/passive is formed with a periphrasis consisting of the verbal adjective *lseli* 'audible, to be heard' and the auxiliary verb *linim* 'to be(come)'.

4.7 Discussion

The rise of periphrastic passive constructions described in Sections 4.1–4.5 (the Armenian formation deserves some considerations of its own, see below) constitutes evidence for the increasing grammaticalization of the active – passive voice opposition in IE languages being achieved through originally non-inflectional means. These developments are largely similar, with some important distinctions as to the original degree of integration of the nominal forms involved into the verbal system. Indeed, in Hittite, Latin and Germanic the participles that occur in periphrastic passive constructions, though obviously nominal in origin, are well-integrated into the verbal system, at least in the sense that there are no other such forms that function as participles in other constructions. On the other hand, the Indo-Aryan PPP, though morphologically similar to its counterparts, was not integrated into the verbal paradigm, which comprised a variety of other participles, both active and middle, for all aspectual stems. The Slavic participles in turn show an even higher degree of grammaticalization in passive function, as they can be made only of transitive verbs. On the contrary, the past participles of all other languages reviewed here (including the Indo-Aryan PPP) could be made both of transitive and of intransitive verbs, hence qualifying as passive participles only to the extent to which the base verb was transitive.

Turning now to the development of periphrastic constructions, most languages attest to an expansion of such constructions at the expenses of the inflectional medio-passive. In Latin, the replacement of the medio-passive through the periphrastic form is ongoing, as the synthetic forms only appeared in tenses based on the present stem. In the passage from Latin to Romance, the replacement was fully accomplished (see Cennamo 2020), in much the same way as it must have happened in Germanic languages. Indeed, in Gothic, too, the inflectional passive was limited to the present tense. The onset of this development, with the inflectional medio-passive increasingly limited to passive function and only occurring in the present was also shared by Celtic. However, as we have seen in Section 3.3, the analytic construction representing the past passive was reanalyzed as a new synthetic form. In Indo-Aryan the PPP was also increasingly used in the past, but it extended in a different way, as it replaced all past tenses while the present remained stable with the Middle Indo Aryan *-ijja-* passive as an outcome of the Sanskrit *-ya-* passive (but with active endings), see Bubenik (1998: 116–124). Later, the replacement of all past tenses by the PPP was fully accomplished and brought about a tense-based split-alignment system.

Apart from Slavic, in which no trace of the PIE medio-passive is preserved, Hittite constitutes a notable exception, as the periphrastic passive, though limited to the past and the present imperative, does not seem to have replaced possible passive usage of the synthetic medio-passive, as shown in examples (14a–b). Even

though Hittite written sources only cover a time span of five centuries in the second millennium BCE, this distribution might reflect an older situation than the one shown by other Indo-European languages. We return to this point in Section 6.1; here it still needs to be remarked that in all languages discussed thus far, participles in periphrastic constructions derive from the *-to/-no* verbal noun, except in Hittite, whose only participle shows the suffix *-ant-*, which elsewhere indicates an ongoing state of the subject (present participle).

Armenian uses synthetic morphology only to a limited extent to distinguish active and passive forms such as, in the present stem, the vowel change *-e-/-i-* and, in the aorist, the medio-passive stem in *-a-* and a corresponding set of endings (but cf. *cn-a-w* 'was born' and 'gave birth' discussed below in Section 5.3). A periphrastic construction occurs in the perfect, which is formed with the copula and the participle in *-eal*. Here, voice distinction may be viewed as being encoded by the case of the A argument, which when inflected in the genitive triggers an active reading, while it triggers a passive reading in the nominative (e.g. *nora*[GEN] *teseal ē* 's/he has seen [something.]' vs. *na*[NOM] *teseal ē* 's/he has been seen.'). In the classical language lexical periphrases are used occasionally to avoid morphologically ambiguous forms, as in (30). Contrary to developments seen in many other languages discussed above (e.g. Latin and Germanic), Middle Armenian developed a new synthetic passive, as we argued in Section 3.4.

5 Minor strategies

Beside the morphosyntactic means of encoding the passive voice discussed in Sections 2–4, ancient IE languages attest to other strategies which could occasionally be employed to encode the passive function. Notably, these are forms for which a passive reading is available only in specific contexts, and therefore never became a conventionalized meaning systematically associated to such constructions. As an example, we discuss the use of lexical passives (Section 5.1), the use of resultative/stative forms of the verb, e.g. the perfect (Section 5.2), and stem class alternation and lability (Section 5.3).

5.1 Lexical passives

Lexical passives are reported for some ancient languages. Formally, this strategy of forming the passive voice can be described as a case of suppletion (cf. Luraghi 2012: 10).

Neu (1968: 110) following Friedrich (1960) gives the following pairs of lexical passives in Hittite: *iya-* 'make' versus *kiš-* 'become', *kuen-* 'kill' versus *ak-* 'die', *dai-* 'place' versus *ki-* 'lie', *šer dai-* 'place upon' versus *šer tiya-* 'be placed upon' (see also Hoffner and Melchert 2008: 305). As an example in which the passive reading is certain, Neu quotes the verb *ak-* 'die/be killed' in (31), which serves as a passive for *kuen-* 'kill' (with the pair 'die/kill' suppletion is a typologically widespread pattern, cf. Haspelmath 1993: 106), and the verb *ki-* 'lie/be oppressed'. A passive reading of *ki-* is particularly clear in example (32), in which it occurs with the agent phrase *IŠTU* ᴸᵁ́KÚR 'by the enemy'.

(31) | *lukkati=ma* | | *INA* É | ᵈLAMA | MÁŠ.GAL | *aki* |
| in_the_morning=PTC | in | house | protective_god | buck | die:PRS.3SG |

'The following morning, in the house of the protective god a buck is killed.'
(KBo 51.130 + iii 6, NS)

(32) | *nu* | *mān* | *IŠTU* | ᴸᵁ́KÚR | *katta* | *kittari* |
| CONN | when | by | enemy | down | lie:PRS.M/P.3SG |

'When the region is being oppressed by the enemy.'
(KUB 25.23 i 12, NH/NS)

In Homeric Greek, it is rather the occurrence of agent phrases that triggers a passive reading of some morphologically active verbs,[33] such as *píptein* 'fall' and *thnḗiskein* 'die', which can function as lexical passives of *kteínō* 'kill', as shown in (33) and (34) (see George 2005: 16–18; Luraghi 2010a: 63).

(33) | *polloì* | | *huph'* | *Héktoros* | *androphónoio* | *thnḗiskontes* |
| many:NOM.PL | under | | H.:GEN | man_slaying:GEN | die:PTCP.PRS.NOM.PL |

píptōsi
fall:SBJV.PRS.3PL
'Many will fall, killed by man-slaying Hector.'
(*Il.* 1.242–243)

(34) | *è* | *thḗn* | *min* | *mála* | *élpeto* | *thumòs* |
| PTC | surely | 3SG.ACC | much | hope:IMPF.M/P.3SG | soul:NOM |

| *hekástou* | *khersìn* | *hup'* | *Aíantos* | *thanéein* |
| each:GEN | hand:DAT | under | A.:GEN | die:INF.PRS |

'For sure the heart of each hoped that he had been killed by the hand of Aias.'
(*Il.* 15.289)

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33 Note that these verbs normally have active meaning: as we remarked above, passive reading depends on the occurrence of an agent phrase.

In Classical Armenian *gan harkanem* 'to beat' consists of the noun *gan* 'beating' and the verb *harkanem* 'to strike'. The whole phrase may take a direct object, as in (35).

(35)   *gan*   *harin*   *zna*
         beating   strike:AOR.3PL   ACC:3SG
         'They beat him.'
         (Mark 12.3)

The corresponding passive is formed with *əmpem* 'to drink' (suppletive aorist *arb-*), i.e. literally 'to drink a beating' (cf. Benveniste 1964: 35; see also example [30] on Arm. *pašton aṙnul* 'take service' as passive of *paštel* 'to serve'), as in (36) in the context of the master of the house returning and beating his servant for not having obeyed his orders.

(36)   *arbcʻē*   *gan*   *bazum*
         drink:SBJV.AOR.3SG   beating(:ACC)   many
         'He [the servant] will be beaten a lot.'
         (Luke 12.47; Gk. *darḗsetai pollás*)

5.2 Perfects and statives

As already pointed out in Section 4, participles with resultative semantics could easily be reinterpreted as encoding passive function, owing to their S-orientation. Similarly, active intransitive PIE perfects had a resultative meaning: they indicated a state resulting from a change of state. Occasionally, this could lead to a passive interpretation, when the perfect indicated a state of the subject, as in Greek *pépoitha* 'be confident', 'be convinced'. Let us consider example (37).

(37)   *ei*   *d'*   *áge*   *toi*   *kephalèi*   *kataneúsomai*   *óphra*
         if   PTC   come_on   2SG.DAT   head:DAT   nod:FUT.MID.1SG   so_that
         pepoíthēis
         convince:SBJV.PRF.2SG
         'See then, I will bend my head, so that you might be convinced.'
         (*Il.* 1.524)

In (37) the form *pepoíthēis* 'convinced' is active. In fact, the perfect did not have a middle voice in PIE, and its development took place to different extents in some of the Indo-European languages. To put it with Kümmel (2020) "the perfect was originally only "active" (non-middle) and could not form a middle. Often, an active perfect belonged to a verb otherwise inflecting as a middle, cf. Vedic *mriyáte* 'dies' : *mamā́ra* 'has died, is dead'; … Greek *gígnetai* 'is born, becomes' : *gégone* 'is born,

exists'". The perfect was in origin S-oriented: in other words, it indicated a change of state that led to the achievement of a state of the subject, hence the passive meaning in (37). Similar occurrences are available form Indo-Aryan. Both in Greek and in Indo-Aryan middle morphology emerged at a later stage, parallel to the shift of the perfect from S- to P-orientation (see Kümmel 2020; Luraghi et al. 2005: 59–61). Notably, however, the passive meaning of the perfect is most often only inferable from the context and remained marginal, as shown by the fact that it does not normally occur with agent phrases. A possible exception shown in (38) features the verb *thnḗiskein* 'die'.

(38) *Kharoiádou gàr édē toû Athēnaíōn*
      Ch.:GEN PTC PTC ART.GEN Athenian:GEN.PL
      stratēgoû tethnēkótos hupò Surakosíōn polémōi
      general:GEN slain:PTCP.PRF.GEN by Syracusan:GEN.PL battle:DAT
      'After Charoeades, the Athenian general, had been slain in battle by
      the Syracusans.'
      (Thuc. 3.90.2)

As we remarked in Section 5.1 the verb *thnḗiskein* 'die' is active, and can function as lexical passive of *kteínō* 'kill' only if the passive meaning is triggered by the occurrence of an agent phrase: this explains the exceptional occurrence with a perfect.

Indo-Iranian also has a dedicated stative, mostly attested in the third person singular and plural. As argued in Kümmel (1996) the existence of the stative has long not been acknowledged, as clear parallels in other Indo-European languages are missing. Since the stative features the endings of the perfect with the present stem, it was long believed that these forms had so to speak intruded into the present. Similar to the perfect, the stative was S-oriented, and in some occurrences the passive meaning is clearly highlighted by the co-occurrence of an agent phrase, as in (39).

(39) *divá stave duhitā́ gótamebhiḥ*
      heaven:GEN praise:STAT.3SG daughter:NOM Gotama:INS.PL
      'The daughter of Heaven is/has been praised by the Gotamas.'
      (RV 1.92.7)

5.3 Conjugation class alternation and lability: the case of Armenian

Armenian shows a radically restructured verbal system as compared to PIE. It features two basic stems, the present and the aorist, which both serve as basis for the formation of the indicative and subjunctive moods. In addition, an imperfect is based on the present stem, and the system features also a distinct inflection for the imperative that

can be further distinguished in present (for negative commands), aorist (for positive commands), and 'exhortative' with a special set of endings (2sg -*ǰir*, 2pl -*ǰikʻ*).

Classical Armenian shows a mixed system of morphological passives marked by inflectional endings in the aorist and a relatively productive strategy of stem-class alternation in the present tense: present stems are formed with the vowel suffixes *e, i, a, u* or complex suffixes ending in one of these vowels, e.g. -*čʻi-*, -*ane-*, -*nu-*, etc., e.g. *erkn-čʻi-* 'to fear', *ancʻ-ane-* 'to pass', *aṙ-nu-* 'to take'.[34] Conjugation class alternation between stems in *e* and in *i* is used for active versus passive readings, e.g. *čanačʻem* 'I know' versus *čanačʻim* 'I am known', as in (40) (see Godel 1975: 47).

(40) *čanačʻem   zimsn   ew   čanačʻim   yimocʻn*
      know:PRS.1SG ACC:my:ACC.PL:DEF and know:PRS.M/P.1SG by_my:GEN.PL:DEF
      '(I am the good shepherd.) I know my own and I am known by my own.'
      (John 10.14)

Present stems in *a* and *u* may be labile, mostly expressing active and reflexive or anticausative meanings, e.g. *luana-* 'to wash (s.th.)/wash oneself/be washed', *baṙna-* 'to lift up/to be taken away, disappear', *hełu-* 'to pour (s.th.)/to flow out', etc. Unambiguous passive constructions with overtly expressed agent, usually marked as PP with *i/y-* + noun in the ablative case, seem to be preferred in cases of ambiguous verbal morphology.

In some morphological categories a formal distinction between active and passive is generally missing, e.g. in the imperfect and the subjunctive of *u*-presents, while in others an existing morphological alternation is non-functional, e.g. in the present subjunctive of *i*-presents, cf. *nsticʻe-/-i-* 'to sit (down)'. Active-passive lability is tolerated in some cases, e.g. 3sg AOR *cnaw* 'gave birth to/was born', cf. ex. (46)–(47) below, but periphrastic constructions and alternative stem formations may be used to differentiate diathesis, e.g. INF *paštel* 'to serve/be served' : *paštōn aṙnul* 'to receive service=be served', see example (30) above (Section 4.6), and *dizane-* 'heap up, assemble (tr.)' : *dizana-* 'assemble (intr.)'. Furthermore, the *e/i*-alternation is not available for all verbs: some verbs, many of them intransitive, are restricted to the *i*-class ('deponents'), e.g. *ankanim* 'I fall', *pʻaxčʻim* 'I flee', *hayim* 'I look', *unim* 'I have', and so on.[35]

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34 There is only one verb with a stem in -*o*-, *goy* 'there is, exists'.

35 The transitive-causative counterpart of non-alternating *i*-verbs may in some instances be formed with the causative suffix -*ucʻane*-, e.g. *nstim* 'to sit (down)' : *nstucʻane-* 'make sit', *meṙanim* 'die' : *meṙucʻane-* 'kill', *usani-* 'learn' : *usucʻane-* 'teach', etc. Conversely, not all transitive *e*-presents have a corresponding passive/anticausative *i*-stem (see examples [28]–[29] in Section 4.6).

Concerning its origin, the suffix *-i-* is assumed to continue PIE **-(i)i̯e/o-*, possibly connected with the suffix of stative verbs (**-eh₁-/-h₁-ye/o-*, see Harđarson 1998: 332–334 and the discussion in Sections 3.1 and 3.2), similar to the Indo-Iranian suffix of *-ya-* stems and to the Ancient Greek *-ē-* passive aorists as in *nstim* 'I sit (down)' Gk. *hézomai* 'sit (down)' < **sed-i̯e/o-*, Arm. *meṙanim* 'I die', Skt. *mriyate* 'dies', Lat. *morior* 'die' (see Meillet 1936: 107; the phonological development in Armenian is for example 1SG **-ii̯e-mai̯* > **-ii̯ímai̯* > *-im*, 3PL **-ii̯e-ntoi̯* > **-ii̯í-ndoi̯* > *-in*). Another possible etymology takes the suffix as having originated from a middle 1SG **-e-mai̯* > **-im* for older **-o-mai̯* (cf. Gk. *-o-mai*; Klingenschmitt 1982: 10–11), and then to have spread to the whole paradigm.

The *e/i*-alternation marking voice opposition also occurs in the present subjunctive formed with the suffix (active) *-icʻe-*, (medio-passive) *-icʻi-* of both *e-* and *a*-verbs, cf. *bericʻem* 'I will carry', *bericʻim* 'I will be carried', *luanaycʻem* 'I will wash (tr.)', *luanaycʻim* 'I will wash myself/be washed'. Compare (41) and (42).

(41) *zotsn*   *luanaycʻē*
      ACC:foot:ACC.PL.DEF   wash:SBJV.PRS.3SG
      'He should wash his feet.'
      (John 13.10)

(42) *amenayn*   *or*   *očʻ*   *ancʻanicʻē*   *ənd*   *hur*
      everything   REL   NEG   pass:SBJV.PRS.3SG   by   fire
      luanaycʻi   *ǰrov*
      wash:SBJV.PRS.M/P.3SG   water:INS
      'Whatever cannot stand the fire, shall be washed with water.'
      (Num 31.23)

In contrast to the subjunctive, indicative presents in *a* do not mark voice opposition and presents in *u* mark it neither in the indicative nor the subjunctive, e.g. *aṙnu-* 'take' and *tʻołu-* 'to leave'. Such verb forms are then labile, and voice must be understood from the context, as shown in (43).

(43) *mi-n*   *aṙnucʻu*   *ew*   *miws-n*   *tʻołucʻu*
      one-DEF   take:SBJV.PRS.3SG   and   other-DEF   leave:SBJV.PRS.3SG
      '(Two men will be in the field;) one will be taken and the other left.'
      (Matt 24.40; Gk. *heîs paralambánetai kaì heîs aphíetai*; cf. the synoptic parallel in Luke 17.35 quoted in ex. [1])

Lability is quite pervasive across Armenian verbal tenses. In the imperfect, voice distinctions are not overtly marked, as shown in (44), in which a passive reading of the form *mkrtein* 'they baptized/they were baptized' is supported by the occurrence of the agent phrase *i nmanē* 'by him', versus the active reading in (45).

(44)   *mkrtein*   *i*   *nmanē*
       baptize:IMPF.3PL   by   3SG.ABL
       'They were baptized by him.'
       (Matt 3.6)

(45)   *mkrtēr*   *ibrew*   *hazars*   *erkus*
       baptize:IMPF.3SG   about   thousand:ACC.PL   two:ACC.PL
       'He baptized about two thousand people.'
       (Bowzandaran Patmowt'iwnk' 3.3)

In the infinitive the *e/i*-alternation is neutralized. A single form in *-el* occurs both for presents in *e* and for presents in *i* (an infinitive in *-il* developed in post-classical times, roughly from the seventh c. onward). Accordingly, both "deponent verbs" in *-i-* have an INF in *-el*, e.g. *nstim* 'I sit (down)' : INF *nstel* 'to sit (down)', and *e*-verbs and verbs with *e/i* alternation, cf. *bžške/i-* 'heal/be healed'

   Finally, Armenian has a participle in *-oc'* with future time reference which is used both in active and passive constructions (on the participle in *-eal* see Section 4.6).

   In contrast to the presents, aorist stems mostly mark diathesis opposition by inflectional endings, see for example *berem* 'carry:AOR.ACT.1SG *beri* 'I carried' versus passive *beray* 'I was carried', except for the 1PL IND ACT=MED-PASS *-ak'* as in *'berak'* 'we carried/we were carried' and the 1PL and 2PL SBJV ACT=MED.-PASS *-c'-uk'* and *-ǰ-ik'*. The medio-passive aorist subjunctive of stems in *-eay* and of some stems in *-ay* has a mixed paradigm with medio-passive 1SG *-(e)ayc'*, but active 2SG/3SG/3PL *-ic'es*, *-ic'ē*, *-ic'en*, as in *kerayc'* 'I will eat', 2SG *keric'es* 'you will eat' (Jensen 1959: 99). However, in some verbs the same medio-passive forms are labile, and can encode both active and passive meaning, as in *cnani-* 'give birth' and 'be born'. Compare examples (46) and (47) with the same verb form, the third person singular aorist *cnaw*:

(46)   *cnaw*   *z-ordin*   *iwr*   *z-andranik*
       bear:AOR.M/P.3SG   ACC-son.DEF   her   ACC-first_born
       'She gave birth to her first-born son.'
       (Luke 2.7)

(47)   *cnaw*   *jez*   *aysōr*   *P'rkič'*
       bear:AOR.M/P.3SG   2PL.DAT   today   savior:NOM
       'Today the Savior was born for you.'
       (Luke 2.11)

Labile and oppositional forms may exist side by side in aorist paradigms. In particular, in the case of the verb *cnani-* the subjunctive can be inflected both as an

e- and as an *i*-stem, hence the opposition active *cnc'e*- 'would give birth' to passive *cnc'i*- 'would be born' (Jensen 1959: 112).

As in the present stem, aorists with non-active marking, but active meaning ('deponents') may use periphrases for the passive, as already discussed in Section 4.6. Remarkably, however, there is no general grammaticalized periphrasis.

5.4 Discussion

As we already pointed out in Section 5, minor strategies discussed here are disparate. Still, lexical passives, labile verbs and statives functioning as passive all have in common the fact that passive interpretation is made possible by the occurrence of an agent phrase. They can be considered instances of passives without passive morphology, and contradict Haspelmath's (1990) claim that such occurrences do not exist (see further the discussion in Section 6.3). A different case is constituted by perfects, whose possible passive interpretation arises from their being S-oriented resultatives. In this way, perfects add a change-of-state impli-cation with respect to statives, which are equally S-oriented, and for this reason contextual reading of perfects as passive does not depend on the occurrence of an agent phrase.

We included conjugation class alternation of Classical Armenian among minor strategies (Section 5.4), even though it likely involves the same suffix as morphological passives in Ancient Greek and in Indo-Iranian (Sections 3.1 and 3.2), because in Armenian this strategy is less systematic than in the latter languages. However, conjugation class change can be viewed as a type of derivation, hence in line with the morphological nature of suffixation in Greek and Indo-Iranian.

6 Conclusion

In the preceding sections, we surveyed different ways to encode the passive in ancient Indo-European languages. Among competing strategies, the most frequent ones are the inflectional middle inherited from PIE and periphrastic constructions involving patient-oriented resultative participles, most often with the suffix *-to-/-no-*. Accordingly, in this final section we start by discussing the distribution of these two strategies (Section 6.1), before moving on to derivation and other minor strategies (Section 6.2). We conclude with a typological evaluation of the data we analyzed in comparison with cross-linguistic evidence as to the frequency of different strategies (Section 6.3).

6.1 The inflectional medio-passive versus periphrastic passives

The middle voice extended to the encoding of the passive in all languages that preserve at least traces of it: in practice, only the Slavic and Baltic languages, which are attested later than most other IE languages, lost the inflectional middle completely and offer no evidence for its usage in passive function. However, even languages known from much earlier times differ as to the extent to which the middle voice could encode the passive function. This extension was especially wide in Ancient Greek, the only language that does not make use of periphrastic constructions. In Latin, too, the extent to which the middle could function as a passive was comparatively high; remarkably, however, Latin shows a tense-based distribution of inflectional (middle) versus periphrastic strategies, which also has reflexes in Germanic. In Indo-Aryan the extent to which the middle voice could encode the passive function was limited due to the extension of the derivational strategy in the present tense and of the PPP, which ended up replacing all past tenses.

Except for Greek, in which periphrastic constructions do not occur, the other languages mentioned thus far attest to a tense-based split. This split is fully paradigmaticized in Latin and in Gothic: in these languages, specific tenses display either strategy, but not both; in addition, the past participle that occurs in the periphrastic forms is integrated into the verbal paradigms, as shown in Sections 4.2 and 4.4. Things are somewhat different in Indo-Aryan, as the so-called PPP is not part of the verbal paradigm as we have argued in Section 4.3: indeed, Indo-Aryan features separate participles for all tenses, which are different from the PPP. However, the extent to which the middle could function as a passive in tenses not based on the present stem was limited, and the use of the PPP was clearly on the rise from Early Vedic onwards.

Hittite offers a slightly different picture: both the inflectional middle and periphrastic forms are already attested at the OH/OS stage, with periphrastic forms being more frequent. In later texts, both strategies co-exist side by side, and in some occurrences they seem to share the same distribution, as argued in Section 4.1. Clearly, it is difficult to compare Hittite, which is attested for a time-span of about five centuries, with Indo-Aryan, documented for three millennia. Still, Hittite seems to show a situation in which there was no clear distinction between the two strategies, and does not support the conclusion that the passive use of the middle was an older strategy and periphrastic forms a later one. In fact, such a theory gains clear support only from Greek. Notably, Greek has reflexes of the *-to-* verbal adjective which occurs in periphrastic constructions in most other languages, but this

verbal adjective, besides not being integrated into the verbal paradigm, also took up a modal meaning, similar to the meaning of the Latin gerundive, and indicates obligation (Luraghi 2016: 17–23).[36] Based on the evidence from other languages, one might even reverse the traditional view, by which the passive was primarily encoded by the middle voice in ancient IE languages with periphrastic forms constituting a later strategy, and conclude that both strategies competed from an early stage on. Languages then followed different paths of development, with the notable exception of Greek, in which periphrastic forms never took on.

Periphrastic constructions also exist in Armenian. Among these, the construction that contains the verb 'be' and the participle in -*eal* features genitive subjects and might also be suggestive of a split alignment system. Other constructions mentioned in Section 4.6 are sporadic, yet their interest lies in the variety of auxiliary verbs they display.

6.2 Morphological passives: inflection and derivation

Several derivational strategies could supply a passive counterpart of transitive verbs and display an ongoing process of integration in the verbal paradigm of various IE languages. Among these, the occurrence of dedicated passive suffixes is best exemplified in the Ancient Greek -*ē*-/-*thē*- aorist (Section 3.1) and in the Indo-Aryan -*ya*-presents (Section 3.2). The latter morpheme likely also served as starting point for the Armenian -*i*-/-*e*- class alternation (Section 5.3), and, if one accepts the reconstruction that connects it to the suffix of stative verbs *-*eh$_1$-/-h$_1$-ye/o*- discussed in Section 3.2, they are also etymologically parallel to the Ancient Greek suffix of passive aorists. These suffixes are commonly described as statives or intrasitivizing, but in fact their function was valency reduction. In these languages, morphological suffixes for the passive voice eventually integrated into the verbal paradigms, though to different extents and also depending on language-specific morphophonological developments. Note that it is unsurprising that this development is common to Indo-Aryan, Greek, and Armenian, which notoriously share a number of common morphological traits, especially in the verbal system, and possibly form a sub-group on their own (cf. Fortson 2010: 203).

Old Irish (Section 3.3) and Middle Armenian (Section 3.4) also feature new morphological passives of different origins. The Old Irish passive was based on a verbal adjective/participle, also occurring in passive periphrastic formations in several other Indo-European languages (see Section 4). The peculiarity of Old Irish

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36 In Greek this function is also encoded by another verbal adjective in -*teos*, whose origin remains controversial (see Tronci 2014; Willi 2009, 2018: 22).

was that rather than being used with an auxiliary, this participle was first analyzed as an independent verb form, and then, through the addition of pronominal prefixes, as an inflected form. This new passive did not enjoy a long life, however, as the prefixes were dropped and even number agreement was lost. Nowadays, the so-called absolute form remains uninflected as an impersonal. As a source for passive morphemes, the Old Irish passive shows a double possibility, including the reanalysis of a nominal form as an inflectional one through the addition of personal affixes. Conversely, the Middle Armenian new passive originated from the segmentation of a morphologically medio-passive form, which gave rise to a new suffix that extended to all verbal paradigms. Finally, conjugation class change in Armenian (Section 5.3) can be viewed as a special case of suffixation, involving different suffixes for either the active or the passive voice.

6.3 The origin of Indo-European passive morphology in typological perspective

Focusing now on the origin of passive morphology, passive morphemes displayed by Ancient Indo-European languages originate out of a variety of sources and processes. These include the paradigmaticization of inflectional voice endings (middle voice; most Indo-European languages to different extents), the grammaticalization of intransitivizing derivational suffixes (Ancient Greek, Indo-Aryan, Armenian), the resegmentation of medio-passive forms resulting in new passive affixes (Middle Armenian), the expansion of reflexive markers into the passive domain (e.g. Balto-Slavic, modern Germanic and Romance languages, Albanian) and, very frequently, the creation of periphrastic forms involving P-oriented past participles or verbal nouns (Hittite, Latin, Indo-Aryan, Germanic, Balto-Slavic, and, to a limited extent, Armenian).

Concerning intransitivizing affixes, Haspelmath (1990: 52) writes: "Originally they serve to mark the inactive meaning of a verb stem. After their expansion they can be more or less freely affixed to noninactive stems and thus serve to inactivize these stems. It is this meaning that makes them suitable for use in passive constructions". Haspelmath (1990: 51) considers the use of such morphemes to form dedicated passives as "the lexical expansion of initially idiosyncratic derivational morphemes". As for periphrastic constructions, those observed in this paper mostly contain the verb 'be' or 'become' as auxiliaries, that is, "intransitive inactive auxiliaries" in the terminology adopted by Haspelmath (1990: 38; see Cennamo 2020 for periphrastic passives built with different auxiliaries in Romance languages). Among the languages in which a verbal noun indicates the passive,

Old Irish stands out as it does so without the addition of an auxiliary.[37] Moreover, Old Irish also shows a peculiar grammaticalization process, whereby personal affixes added to the participle give rise to new inflected passive forms.

The only IE branch in which there are no traces of inherited middle forms is Balto-Slavic. In this branch, beside the use of periphrastic forms with the participle in passive function, one can also observe the onset of the development of a new reflexive middle, which is also a feature of the vast majority of other Indo-European languages of Europe, and can occasionally extend to the encoding of the passive function (Section 4.5 and Haspelmath 1990: 42–46 on the passive use of the reflexive middle in Slavic, Romance and Germanic languages, Section 2.2 on Albanian). While this development falls outside the scope of the present paper, it is still worth mentioning, as it provides evidence for another source of passive morphemes, that is, reflexive pronouns or reflexive affixes. Note that in the Slavic example in (25), the clitic *se* is still analyzable as a pronoun, but in later developments of the same type of construction attested in Modern Scandinavian languages its status is closer to that of a bound morpheme (see Haspelmath 1990: 29–30, who considers the reflexive suffix in Icelandic and Danish as an 'extrafix').

Contrary to Haspelmath's (1990: 27) claim that "in general passive constructions without passive morphology do not exist", we also showed that Classical Armenian does in fact show a passive construction with no morphological marking as it makes use of extensive lability (Section 5.3). Note that passive lability is in general very rare in the world's languages, and has been systematically reported only for some languages of Africa (see Creissels 2014; Letuchiy 2009: 227). Similarly, other minor strategies, such as lexical passives (Section 5.1) or occasional passive interpretation of statives and perfects/resultatives (Section 5.2) might also be analyzed as passives without dedicated morphology, which, unlike lability in Armenian, remain limited. In much the same way as lability, however, the latter two strategies are also context dependent, as they involve specific forms that need some contextual cues in order to be taken as encoding passives.

Zúñiga and Kittilä (2019: 188–189) do not add much to Haspelmath's data. They list a limited number of what they call uncoded strategies, from Central Alaskan Yupik, which however does not seem to allow for the co-occurrence of an agent, and form some Austronesian languages. Among the latter, Manggarai features an agent phrase marked as oblique, and is similar to the Armenian

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37 Remarkably, this does not mean that other languages obligatorily require an auxiliary in periphrastic forms involving a participle. In Hittite, for example, the auxiliary never occurs in the present indicative (Section 4.1 and example [13]). In Indo-Aryan, the auxiliary is frequently omitted even at the stage of Early Vedic (see example [17]), and it virtually never occur in Classical Sanskrit. However, only in Old Irish an auxiliary never occurs in this type of construction.

occurrences with passive lability, while in Palu'e passive reading appears to be dependent on word order.[38]

When framed with cross-linguistic evidence from non-IE languages, some of the IE data strike the observer as being quite infrequent, if not unique. In his survey, Haspelmath found that 31 languages out of 80 contained in his sample have a passive,[39] and attest to 39 different morphological strategies. Among these, an inflectional strategy consisting of a set of passive endings (differential subject person markers in Haspelmath's terminology) is only attested in two languages of the sample, Latin and Modern Greek. This distribution complies with the general tendency whereby languages favor derivational strategies for the encoding of voice and valency changing operations (Bybee 1985: 29–32) and also with the relatively rare overlap of voice and person marking (see Auderset 2015). Specifically, passive inflectional morphology is seldom found outside IE languages (see e.g. Kharia [Munda; Peterson 2011] and Motuna [South-Bouganville; Onishi 1994]). Conversely, in our survey, we have shown that not only do most IE languages attest to the passive use of the middle endings, but new personal affixes developing from clitic pronouns also indicate a tendency to the renewal of passive inflectional morphology in Irish.

Periphrastic forms consisting of a participle and an auxiliary are more frequent than passive inflectional endings in Haspelmath's sample, but again, those that contain the copula 'be' are limited to IE languages, as had already been observed by Dryer (1982; see further Haspelmath 1990: 38–42). On the other hand, derivational strategies cover the majority of languages: Haspelmath (1990: 28) lists 25 cases of "additional stem affix" in languages of different genetic and areal affiliation, including Afro-Asiatic, Andean-Equatorial, Australian, Austroasiatic, Austronesian, Indo-Pacific, Niger-Kordofanian, Penutian, Uralo-Altaic, and Inuit (isolate).[40] In addition, he also mentions one instance of "alternate stem affix" from Kefa, an Afro-Asiatic language (Haspelmath 1990: 31), similar to conjugation change in Armenian, which we considered another derivational strategy (Section 5.3). Interestingly, though being well attested in IE languages, derivational strategies are typically limited to a part of the verbal paradigm, such as the aorist and

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38 Zúñiga and Kittilä (2019: 189) also include among uncoded passive alternations the so-called "middle alternation" of the type of English *I cut the meat / The meat cuts easily*. This type of construction, however, falls outside our definition of passive.

39 The percentage of languages that have a passive in this sample is about 39%, only slightly lower than the percentage found in the much bigger sample analyzed by Siewierska (2013), about 43% (162 languages with a passive construction vs. 211 without).

40 Haspelmath also includes Modern Greek among languages that feature derivational strategies on account of the occurrence of the *-th/t-* suffix before the passive endings in perfective stems (see Section 3.5). We return to this formation further on in this section.

future in Ancient Greek or the present in Indo-Aryan. As we have argued in Section 3.5, both formations enjoyed a long stability over time. When changes in the verbal system caused a substantial restructuration, derivational strategies were dismissed in Indo-Aryan, in which periphrastic formations gained ground (Section 3.5). In Modern Greek, a dental suffix that goes back to the ancient passive aorist still occurs in the perfective passive, which, contrary to the Ancient Greek aorist passive, also features dedicated passive endings different from the active ones (Section 3.5).

Summing up our findings, IE languages offer evidence for a rich and varied inventory of passive constructions. Remarkably, in IE languages alone, one finds most of the cross-linguistically available types of construction for the encoding of the passive, derive from a pool of diversified historical sources (see Haspelmath 1990; Zúñiga and Kittilä 2019: 91–94, 224–226). While some of these types of constructions are quite common in the world's languages, e.g. derivational affixes, reflexive passives and auxiliary verb constructions, others have often been regarded as typological rarities, i.e., the use of inflectional person/voice endings, conjugation class change, and lability.

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