Reconstructing the PIE causative in a cross-linguistic perspective

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Abstract

This paper examines the function and distribution of **CoC-éye/o-* presents (traditionally labelled as causatives/iteratives) in PIE in the light of recent theoretical and typological contributions on causative formations crosslinguistically. In particular, this paper argues that: 1. The oldest function of *CoC-éye/o-* presents in PIE is to derive *causative* presents to unaccusative base verbs, as well as to some transitive verbs with an affected subject. The development of the iterative meaning is secondary and *einzelsprachlich*. 2. In the daughter languages, the category developed in two different directions (following Shibatani & Pardeshi's *causative continuum*), depending on its degree of productivity. In Greek and Latin, the category became unproductive and underwent a "causative/non-causative" split, whereby the iterative meaning developed under certain conditions. A parallel development of the causative morpheme in the Mayan language K'iche' is discussed into detail. 3. In Vedic and Proto-Germanic, the category became more productive and did not develop iterative semantics.

Keywords

causative – iterative – valency – typology – grammaticalization – lexicalization – transitivity – unaccusative

1 Introduction

Indo-European verbal formations of the shape *CoC-éye/o-* make up the single largest category in the *Lexicon der Indogermanischen Verben*² (440 roots, 237

certain). They are exclusively present-stem formations. They are found in most daughter languages, whether in productive (Indo-Iranian, Germanic) or residual form (Old Irish, Greek, Latin). Common examples include:

(1)   a.   Lat. *foveō* 'to make warm' < PIE *$d^{h}og^{wh}$-éye/o-*
       b.   Gk. *phoréō* 'to carry around, to wear' < PIE *$b^{h}or$-éye/o-*
       c.   Ved. *vāsáyati* 'to clothe' < PIE *wos-éye/o-*

(2)   a.   PDE *lay* < P.Germ. *$lagja$-* < PIE *log^{h}-eye/o-*
       b.   cf. PDE *lie* < P.Germ. *$lig(j)a$-* < PIE *leg^{h}-(y)e/o-*

We call these present stems causatives/iteratives because sometimes they have causative meaning (1a, 1c) and sometimes iterative (or intensive) meaning (1b), in a way that seems lexically determined and sometimes different from language to language. Open questions remain what factors govern the alternation between the two meanings (for Latin, see recently Kölligan 2007) and whether these factors are the same in all of the attested languages.[1]

As for the original function of this category in PIE, there have been three approaches so far: (1) to reconstruct the causative/iterative polysemy for PIE (Fortson 2010: 99; Weiss 2009: 403); (2) to assume that either meaning is the oldest, and to argue that either the iterative came first (Delbrück 1897: 109; Jasanoff 2003: 134), or that the causative came first (transitive first, per Jamison 1983: 186–89); (3) to declare that neither meaning came first, but that these are originally denominative formations (Kuryłowicz 1956: 86) with unpredictable semantics (accepted by Meier-Brügger 2003: 173, reproposed by Peters 2016).

The goals for this paper are: (1) to review recent theoretical descriptions of the causative which are relevant to the PIE situation; (2) to discuss typological evidence concerning other non-Indo-European languages which have formations with causative/iterative meaning, and examine how those meanings are

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1   A further question, which goes beyond the scope of this paper, is whether *other* formations in PIE had causative function as well, and how they differed from *CoC-éye/o-* presents. For instance, we know that nasal infix presents have transitive meaning in Vedic and Hittite, and that *-sḱe/o-* presents make causatives in Tocharian and iteratives in Ionic Greek and Anatolian (Weiss 2009: 407). A recent important contribution in this direction is Covini (2017), who looks at nasal presents, reduplicated presents, and *CoC-éye/o-* presents in the oldest-attested IE languages (i.e., Anatolian, Indo-Iranian, Italic, and Greek), and concludes that *CoC-éye/o-* presents seem to be the most recent causative formation among the three, whose spread (and sometimes replacement of the other two formations within individual verbal systems) is almost entirely *einzelsprachlich*. For a complete treatment of nasal presents in Vedic, see now Zasada (2020).

distributed in the language (with a focus on the Mayan language K'iche'); (3) to propose a diachronic path of development for causative morphemes (adapting a proposal by Shibatani & Pardeshi 2001) that is consistent with the typological data and the synchronic situation in Greek, Latin, and Vedic.

In particular, this paper will argue that:

a. The oldest function of *CoC-éye/o-* presents in PIE[2] was to derive *causative* presents to unaccusative (S_O) verbs.[3]

b. In the daughter languages, the category developed in two different directions, which are tied to changes in its productivity. In Greek and Latin, the category has become unproductive and undergone a so-called "causative/non-causative" split, whereby the iterative meaning developed under certain conditions (see section 4 below). In Vedic (and Proto-Germanic), by contrast, the category has not undergone this split and has become more productive, with no development of iterative meaning.

2 Causative formations in cross-linguistic perspective

2.1 *Canonical causatives*

Causatives are valency-increasing derivations that add one argument to the base-verb. Typically, causatives take an intransitive verb (*base verb*) and turn it into a transitive (*causative verb*) by adding one argument (the *causer*) in the Agent function.[4] The former intransitive subject (the *causee*) is now in Object

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2 Two forms in Anatolian provide evidence for the existence of this formation in PIE (and not just in Core IE): "These are Hitt. *lukke-zzi* 'lights up, sets ablaze' ⟨which⟩ was taken by Watkins (1971: 69) to derive from a causative **louk-éye/o-* seen also in e.g., Ved. *rocáyati* 'make shine', Lat. *lūceō, -ēre* 'ignite, light'; and Hitt. *waššezzi* 'clothes (someone)' continues **wos-éye/o-*, to be equated with Ved. *vāsáyati*, Goth. *wasjiþ* (PGmc. **waz-jan*, also Eng. *wear*), Alb. *vesh*, as demonstrated by Eichner (1969)" (Lundquist & Yates 2018: 2164–65). Note that both forms have causative, not iterative meaning (we shall return to **wos-éye/o-* in section 6 below). For more on causative formations in Hittite, see Luraghi (2012).

3 Throughout this paper, I will use the abbreviations A (agent of a transitive verb), S_A (agentive subject of an intransitive verb), and S_O (non-agentive subject of an intransitive verb). These are taken from Dixon's work on ergativity (1994). In general terminology, S_A corresponds to *unergative*, and S_O to *unaccusative* (for unergative and unaccusative, the classic treatments are Perlmutter 1978; Levin & Rappaport Hovav 1995). An S_O verb is thus an intransitive verb taking a non-agentive subject, i.e., an unaccusative verb.

4 For some languages, it can be useful to employ more specific terminology for the new argument, and distinguish between Agent, Causer, and Instrument. Some languages, for instance, may allow a causative derivation which adds an Agent (e.g., *I made the dog run*), but not one that adds an Instrument (e.g., *The stick made the dog run*).

function (cf. examples 4a and 4b below). It is also possible for some causative formations to operate on verbs that are already transitive, as in (6c).

Causative formations can be very sensitive to the lexical semantics and argument structure of their base verbs. In particular, some causative formations only apply to unaccusative base-verbs (S_O), but not to unergative base verbs (S_A). In several languages, causatives do not operate on a verb that is already transitive (A). Within unaccusative verbs (S_O) expressing a change of state, causatives may further be sensitive to the distinction between externally-caused and internally-caused changes:

(3) a. Internally-caused change-of-state verbs: 'grow', 'die', 'become tired', 'burn'
     b. Externally-caused change-of-state verbs: 'crush', 'melt', 'break', 'boil'

In several languages, causatives only operate on internally-caused S_O verbs, while they do not operate on externally-caused S_O verbs, which already obtain a causative reading when used transitively; in the typological literature, they are called *labile verbs* or *lexical causatives*, see below. This is what happens in Japanese (cf. Shibatani & Pardeshi 2001: 138) and K'iche' (see Campbell 2000; Gluckman 2015; and section 3 below).

Shibatani & Pardeshi (2002: 146) single out another category of verbs that can behave idiosyncratically when it comes to causative formations. These are *middle verbs*, a semantic category that groups some intransitive and transitive classes by having a subject/agent that is also affected by the action of the verb, such as verbs of position (*lie, sit* = S_O). Within this category we should single out verbs of ingestion (*eat, drink*) as well as verbs of apparel (*wear*): as we shall see, these seemingly simple transitive verbs arguably formed a distinctive class of *CoC-éye/o-* causatives in PIE and, in some languages, functioned as pivots for the expansion of the category.

In linguistic typology, one usually speaks of three types of causative derivations: lexical causatives, morphological causatives, and syntactic causatives. The first type is not really a derivation, but a way to describe the semantic relationship between two verbs in the language, e.g., the English verbs *die* and *kill* (in the sense that *to kill X* means *to cause X to die*). In theoretical discussions, the term "lexical causative" is often used to describe transitive verbs in general. In English, the verb *lay* used to be a morphological causative of *lie* (cf. example (2) above), but it has now become a simple lexical causative thereof.[5] The same is true of the verbs *sit* and *set*, *fall* and *fell*, *drink* and *drench*, etc.

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5 Moreover, some speakers now often use the two interchangeably (*I was laying down* meaning

(4) a. The candles sit on the table
     b. I set the candles on the table

Morphological causatives and syntactic causatives can coexist in a language, with syntactic causatives usually being more productive (and having fewer usage restrictions) than morphological ones. In K'iche', the morphological causative marked by the suffix *-isa-* operates on internally-caused unaccusative base verbs, but not on externally-caused unaccusative verbs or unergative verbs. In contrast, the syntactic causative, which uses a periphrasis with the verb *b'an* 'make', can operate on all sorts of base verbs (see section 3 below). Two examples from IE are as follows:

(5) a. *morphological causative*: Ved. *vāsáyati* 'clothe' to the root *vas-* 'wear'
     b. *periphrastic (syntactic) causative*: It. *far vestire qualcuno* 'to make somebody get dressed' to the verb *vestire* 'to wear'

Just like Italian, English no longer possesses morphological causatives, but it has a productive process for creating syntactic causatives using a periphrasis with the verb *to make*. This process can apply on all sorts of verbal bases (all unaccusative verbs, unergative verbs, and transitive verbs), as shown below:

(6) a. The dog (S_O) sleeps → I (A) make the dog (O) sleep
     b. The dog (S_A) runs → I (A) make the dog (O) run
     c. The dog (A) eats a cookie → I (A) make the dog (O) eat a cookie

To sum up, if a language has a morphological causative, this should operate at minimum on S_O verbs that are internally caused ('die', 'grow', etc.). If it operates on those, it may operate on others as well.

I was lying down): this process, whereby a former morphological causative comes to compete with and eventually replace its base verb in its original meaning, is crosslinguistically common, and likely lies at the base of the descriptive observation that in several languages "the same morpheme is used in forming what corresponds to a transitive verb as well as that which corresponds to causative forms in other languages" (Shibatani & Pardeshi 2001: 139). As for Engl. *lie* vs. *lay* specifically, the confusion goes back to Late Middle English, and was at least in part triggered by the phonetic similarity of the two verbs and increasing opacity of the inflection *lie—lay—lain*.

2.2   *Causatives that do not cause*

Indo-European is not the only language group where causative morphemes show some amount of polysemy. Aikhenvald (2011) reports that it is quite common crosslinguistically for morphological causatives to encode non-causative meanings when derived to certain base verbs. Summarizing the results of her survey, she lists the following non-causative meanings that can be encoded by causative morphology, sorted by the semantic component that they impact (2011: 136):

1.   the Agent: increase in intentionality, manipulation, effort, control (e.g., Tariana, Bouma Fijian, Manambu);
2.   the Action: intensive and/or iterative (Tariana, Bouma Fijian, Manambu, Tongan);
3.   the Object: complete affectedness of the O, multiple or large O (Manambu, some dialects of Tariana, Creek).

These, she claims, are all features that make a verb, if not causative, more prototypically *transitive*. Some languages may also use causative morphology to imply lack of intentionality (or rather, presence of a *causee*), or applicative derivation.[6]

Something of the sort, of course, seems to be what is happening in PIE with the causative/iterative polysemy of *CoC-éye/o-* formation, though the polysemy in PIE appears to be limited to impacting the Action parameter of the predicate (and not the Agent or the Object). For the purposes of our investigation, the questions here are (a) how does this type of polysemy work synchronically, and (b) under which historical conditions, and in what sequence does the polysemy develop?

2.3   *Revising the causative continuum*

Shibatani & Pardeshi (2001) have proposed a theory to try to account for the form, function, and distribution of causatives cross-linguistically. The theory has two components: (1) a semantic continuum for causative expressions (*the causative continuum*), and (2) the hypothesis that we can use the productivity of a causative expression to make predictions about its location along the con-

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6   An applicative derivation is a valency-increasing process which, like the causative, adds an argument to the base verb. This argument, however, is not an agent or causer, but an object (such as, for instance, an instrument) (see Dixon 2012: 295–98). An "English" example would be I_S *cut with a knife* → I_A *cut-with* [*a knife*]$_O$. Applicatives can operate on intransitive and sometimes transitive base verbs as well. Ancient IE languages clearly had some applicatives (see for instance examples (18–21) below from Latin), though a systematic treatment of the category is still a desideratum.

tinuum and grammaticalization status. As we shall see, this theory can offer us valuable insights into the PIE situation and how it evolved in the daughter languages, and it can help us to account for the existence of the "causatives that do not cause" listed above.

2.3.1 The causative continuum

When it comes to causatives and causation, we normally talk about some action (by one agent) bringing about some other action (normally on another subject). There are different ways in which the "bringing about" can happen. Shibatani & Pardeshi distinguish between *indirect causation* (e.g., you tell somebody to do something, and they do it) and *direct causation* (e.g., you exert some physical force directly onto an object in order to obtain a result).[7]

(7)   a. *indirect causation*: the teacher made the child sit (by asking)
       b. *direct causation*: the teacher sat down the child (by physically sitting
          her down)

The type of causation impacts the *Aktionsart* of the resulting predicate: in indirect causation there can be time between the action of the causer and the caused action (e.g., I can ask you today to do something tomorrow), thus the resulting predicate will have some internal complexity (and be potentially durative and telic); in direct causation the causing and the effect will overlap in time, either partially or completely, thus yielding a telic, punctual action. Another way of expressing this difference is to say that with indirect causation we have two distinct events (e.g., the teacher issuing a command and the child sitting down), whereas with direct causation, we tend towards a single event (e.g., the teacher physically putting the child in a sitting position).

As we move from indirect (or distal) causation to direct causation, the *causee* changes as well. While it was agentive with indirect causation (the child decided to sit down, obeying the teacher), it becomes more and more object-like as we move towards the single-event type (the teacher effectively moved the child as if she were a puppet).

Shibatani & Pardeshi observe that languages will typically use *transitive verbs* (which can be labelled as lexical causatives) for single-event, direct causation (e.g., the teacher sat down the child), while they typically use causative expressions (morphological or syntactic) for multiple-event, less direct types

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7   A somewhat older terminology is *manipulative* causation vs. *directive* causation (Shibatani
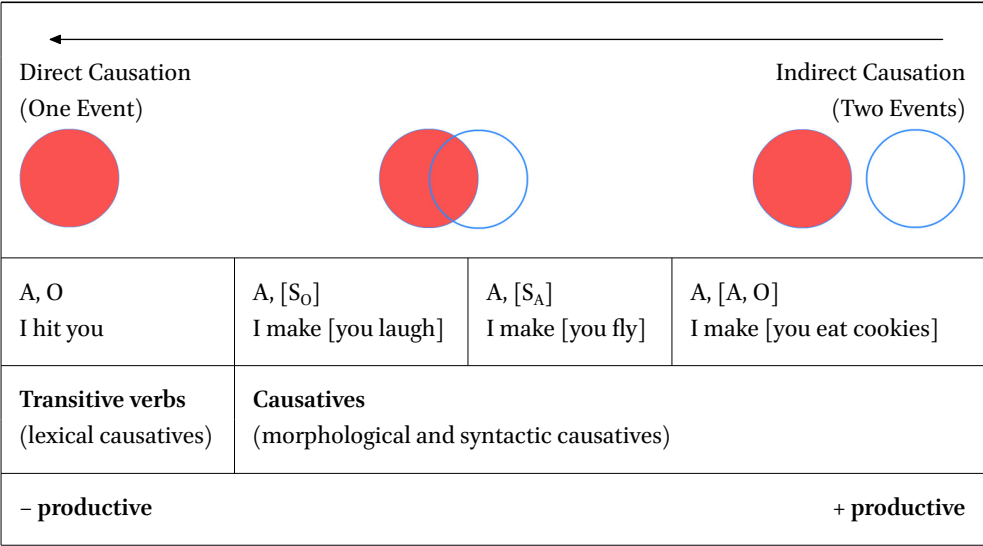   1973).

Direct Causation (One Event)			Indirect Causation (Two Events)
A, O	A, [S$_O$]	A, [S$_A$]	A, [A, O]
I hit you	I make [you laugh]	I make [you fly]	I make [you eat cookies]
Transitive verbs (lexical causatives)	**Causatives** (morphological and syntactic causatives)		
– productive			**+ productive**

FIGURE 1   The causative continuum

of causation.[8] Additionally, Shibatani & Pardeshi argue that the *productivity* of a given causative derivation aligns with the continuum as well: processes expressing single-event, direct causation tend to be less productive (in that this area tends to be largely lexicalized), while processes expressing multiple-event, indirect causation tend to be more productive. All of these points are summarized in Fig. 1 above.

2.3.2   The position of an expression along the continuum
With respect to polysemy in causatives, there is one important dividing point along the continuum: this is the boundary between causatives that can encode two events (whether temporally overlapping or not) and causatives that can only express one. We can call this the *single-event line*. In Fig. 1 above, the line would be located just to the right of the "direct causation" column.

   Shibatani & Pardeshi (2001: 171) posit that, over time, causative expressions move from right to left along our continuum, gradually becoming less productive, and gradually losing their capacity to encode more than one event. They label this process "grammaticalization", though we should label it more properly "lexicalization", since this is a process whereby an expression loses produc-

8   It is also possible for some languages to use separate causative constructions for the two types of causation. One such language is Yimas, as reported by Foley (1991: 291–93).

tivity and becomes more and more fixed. As we shall see, different branches of Indo-European show examples of the *CoC-éye/o-* causative moving in either direction along the continuum, depending on whether the formation increases or decreases in productivity. This argues against seeing the continuum as a grammaticalization cline for the causative, since unidirectionality is usually assumed to be a defining property of grammaticalization.

In the history of English, the *CoC-éye/o-* causative moved along this line according to Shibatani & Pardeshi's theory. While in Proto-Germanic the *CoC-éye/o-* derivation could apply to a large number of verbs, it gradually became less productive in English, and today its few remaining representatives are entirely lexicalized (e.g., *sit* and *set*; *drink* and *drench*, etc.) and the process is completely unproductive. In fact, one might say that, at this point, *set* and *drench* are recognized as simple, single-event transitive verbs in English. As mentioned in the footnote above, this lexicalization process can also cause a former causative formation to replace its original base: cf. English *lie* and *lay*, in which the latter is increasingly encroaching on the former. Finally, in some languages, old causative morphemes can come to be reanalyzed as plain markers of transitivity. This seems to have happened for some nasal presents in Vedic—and arguably already in PIE—which seem to function as present-stem formants for transitive roots (see the discussion in Zasada 2020: 38–45 & 48).

2.3.3   The causative/non-causative split

The fate of the *CoC-éye/o-* causative in English is shared by several causative expressions crosslinguistically. When crossing the single-event line, these expressions can experience a *narrowing of scope*. For instance, the causative construction can become limited to S_O (unaccusative) predicates. Examples of this phenomenon are found in Korean, whereby Middle Korean reportedly permitted morphological causatives to S_O, S_A, and A verbs, while in Modern Korean those same causatives are limited to S_O verbs only (Shibatani & Pardeshi 2001:164). Similarly, Aikhenvald (2000:157–58) reports that in Tariana (Arawak, Amazonia), morphological causatives can only be formed synchronically to S_O verbs. However, a few morphological causatives to A (transitive) verbs are allowed with predicates referring to ritual actions (e.g., to drink ritual whiskey or to smoke a traditional cigar), possibly reflecting an archaic usage.[9]

But narrowing of scope is not the only fate for causative expressions crossing the single-event line. Another option is for that construction to undergo

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9 One should note that these are also verbs of ingestion, whose subject is affected by the action, and thus more similar to the subject of an S_O verb (see the discussion in section 4.4 below).
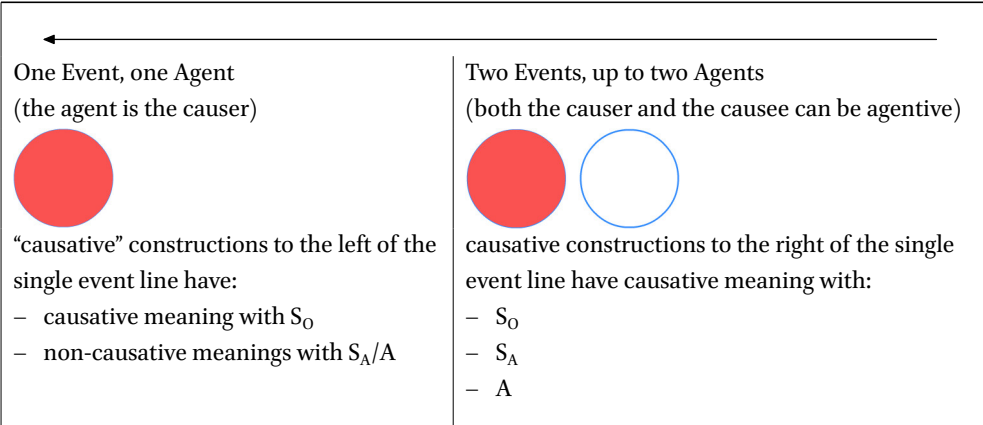
One Event, one Agent
(the agent is the causer)

Two Events, up to two Agents
(both the causer and the causee can be agentive)

"causative" constructions to the left of the single event line have:
– causative meaning with S_O
– non-causative meanings with S_A/A

causative constructions to the right of the single event line have causative meaning with:
– S_O
– S_A
– A

FIGURE 2   The single event line and causative/non-causative split

what we can call the *causative/non-causative split*. It is this split, in Shibatani & Pardeshi's model, which gives origin to the "causatives that do not cause" seen above. In a causative/non-causative split, the causative construction acquires non-causative meanings with S_A and A predicates. As we shall see below, K'iche' shows precisely such a split: the morphological causative morpheme *-isa-* attaches productively only to S_O verbs, yet it yields non-causative meanings when attached to *some* A verbs. Note that the non-causative meanings are less predictable, and more lexically determined: they are not productively generated in the language.

To sum up, the *single event line* captures why S_O/S_A is an important distinction for a number of causatives (as mentioned in section 2.1 above). For some causative expressions, the *single-event line* is where they stop applying; for some others, it is where the causative/non-causative split is found.

3   Comparative case study: the causative in K'iche'

We can observe Shibatani & Pardeshi's model at work in the K'iche' morphological causative, which provides a close parallel to the situation in some older IE languages. Here too, we find a causative morpheme which can take iterative (i.e., non-causative) meanings when applied to some types of base predicates.

K'iche' is a Mayan language of Guatemala (ISO 639–3, quc); with around 2,330,000 speakers, including 300,000 monolinguals, it is the largest of the Mayan languages (*Ethnologue*). K'iche' has no nominal case marking, but it marks ergative-absolutive agreement on the verb-word (i.e., all of the core argu-

ments are marked on the verb). Word order in elicitation is normally SVO, though in natural discourse there is much more variation (the pragmatically neutral order might be predicate-initial, as in Proto-Mayan).

K'iche' is very rich in valency-changing derivations (for an overview, see Larsen 1988; Campbell 2000). These are normally expressed through suffixes on the verb (falling in slot 5 below). The status marker in slot 6 also reflects the transitivity of the predicate. The structure of the K'iche' verb is summarized in Table 1 below.

TABLE 1   The K'iche' verb

TAM prefix	Person agreement		Verbal stem		
Slot 1	Slot 2	Slot 3	Slot 4	Slot 5	Slot 6
TAM	SET B MORPHEMES (ABSOLUTIVE AGREEMENT)	SET A MORPHEMES (ERGATIVE AGREEMENT)	ROOT	DERIVATION	STATUS MARKER
x	*at*		*kam*		*ik*
x	*at*	*in*	*kam*	*isa*	*j*

K'iche' has a causative suffix *-isa-* (morphological causative), which attaches to S_O intransitive verbs (unaccusative) and makes them transitive (see Larsen 1988: 195; data partially from Gluckman 2015). For instance, from the base *kam* 'die', one can derive the verb *kamisa* 'kill'.

(8)   a. *x-at-kam-ik*
         PFV-2SG.B-die-SM
         'You died'

     b. *x-at-in-kam-isa-j*
         PFV-2SG.B-1SG.A-die-CAUS-SM
         'I killed you'

Similar examples are given in Table 2 below (after Gluckman 2015: 4). We can label these formations (causatives to S_O verbs) Group 1.[10]

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10   Note that, as discussed in Gluckman (2015), K'iche' only forms *-isa-* causatives to inter-

TABLE 2   Group 1: K'iche' *-isa-* causatives to S$_O$ verbs

Base verb (So)	Derived *-isa-* causative
num 'be hungry'	*numisa* 'make hungry'
b'ison 'be sad'	*b'isonisa* 'make sad'
walaj 'get up'	*walajisa* 'lift'
k'iy 'grow'	*k'iyisa* 'grow/raise'
kix 'feel ashamed'	*kixisa* 'make feel ashamed'
kub' 'sit'	*kub'isa* 'make sit'

An interesting subcategory within Group 1 is made up of intransitive predicates that have a dative goal. When added to these types of unaccusative verbs, *-isa-* promotes the dative goal into a core argument position. The alternation appears to be regular with verbs of emission ('vomit', 'sneeze', 'howl', etc.). This is an applicative derivation (see footnote 6 above).

TABLE 3   Group 1a: K'iche' *-isa-* applicatives to S$_O$ verbs with a dative goal

Base verb (So, dative goal)	Derived *-isa-* applicative
xoj 'vomit'	*xojisa* 'vomit on X'
wun 'howl'	*wunisa* 'howl at X'
tix(*nam*) 'sneeze'	*tixisa* 'sneeze at X'

(9) a. *x-ø-wun*   *la   tz'i' chwij*
        PFV-3SG.B-howl DET dog RN.1SG
        'The dog howled at me'

   b. *x-in-u-wun-**isa**-aj*   *la   tz'i'*
        PFV-1SG.B-3SG.A-howl-CAUS-SM DET dog
        'The dog howled at me' (Not 'the dog made me howl')

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nally-caused S$_O$ predicates (e.g., *be sad* and intransitively-used *grow*). Externally-caused S$_O$ predicates like intransitively-used *break* or *crush* automatically receive a causative reading when used transitively, much like in English. Causatives to remaining types of predicates are formed periphrastically.

In both cases, *-isa-* thus functions as a valency-increasing derivation, increasing the number of core arguments in the predicate from one to two.

However, it is also possible to add *-isa-* to certain verbs that already have two core arguments (i.e., transitive verbs). In such cases, the verb remains transitive, and the meaning added is not that of causation. Depending on the lexical semantics of the base verb, application of the *-isa-* causative to a transitive verb yields: (a) no change in meaning, (b) added definiteness to the object, (c) added intensity/iteration to the action, (d) multiple object marking, (e) conative meaning.

We will start with iterative/intensive meanings to A verbs, which we will label Group 2. The meaning of the resulting *-isa-* form depends on the Aktionsart of the base verb. When the predicate consists of a telic event, the *-isa-* derivation yields iteration of the action (either on the same object or on multiple objects) or conative meaning.

TABLE 4   Group 2: K'iche' *-isa-* iteratives to A telic verbs

Base verb (A, telic)	Derived *-isa-* iterative
kach' 'bite'	*kach'isa* 'bite multiple times'
q'at 'cut'	*q'atisa* 'cut multiple times'
ch'up 'erase'	*ch'upisa* 'erase multiple times'
b'an 'have sex (with)'	*b'anisa* 'have sex multiple times'
poroj 'burn (a candle)'	*porojisa* 'burn many candles'
tij 'eat (food)'	*tijisa* 'eat a lot of food'
miq'ja 'boil water'	*miq'isa* 'boil again'
chap (*jun tz'i'*) 'touch (a dog)'	*chapisa* (*jun tz'i'*) 'try to catch (a dog)'

(10) *La   ali   Kiara   x-ø-u-tij-**isa**-aj   kinaq'*
      DET FEM Chiara PFV-3SG.B-3SG.A-eat-CAUS-SM beans
      'Chiara ate a lot of beans' (like three kilos)

(11) *x-ø-ki-poroj-**isa**-aj   kantela*
      PFV-3SG.B-3PL.A-burn-CAUS-SM candle
      'They burned many candles' (the Mayans during their rituals)

Note that there are some subtle differences among the iterative (one could say *pluractional*) meanings listed above, all dependent on the precise verbal semantics of the base verb. With base verbs expressing a single telic event

(*semelfactives*), the iterative encodes repetition of the action on the same object (as with 'boil water', 'bite', and 'have sex'), at least if the expectation is that the action is easy to complete. If the action is viewed as hard to complete, we can get a conative reading (as with 'trying to catch a dog'). When the base verb expresses a single telic event in which an object is consumed (e.g., eating food, or burning a candle), the iterative will imply that the action is repeated on *multiple* objects (e.g., eating a lot of food, burning many candles).

When the predicate consists of an atelic event, *-isa-* derivation yields a durative reading instead:

TABLE 5   Group 2a: K'iche' *-isa-* iteratives to A atelic verbs

Base verb (A, atelic)	Derived *-isa-* iterative
q'aluj 'hold'	*q'alujisa* 'hold for a long time'

(12) a. *x-ø-in-q'aluj*   *ri*   *nuch*
   PFV-3SG.B-1SG.A-hold   DET   baby
   'I held the baby'

  b. *x-ø-in-q'aluj-**isa**-aj*   *ri*   *nuch*
   PFV-3SG.B-1SG.A-hold-CAUS-SM   DET   baby
   'I held the baby for a long time' (like three hours)

Finally, with some transitive psych verbs, there is no change in meaning, but added definiteness to the object and a possible emphatic reading. We shall label these Group 3.

TABLE 6   Group 3: K'iche' *-isa-* "causatives" to A, psych verbs which are (almost) equivalent to the base verb

Base verb (A, psych)	Derived *-isa-* "causative"
na't 'remember'	*na'tisa* 'remember'
achik' 'dream'	*achik'isa* 'dream'
loq' 'love'	*loq'isa* 'love'

While both the base form and the derived forms are transitive, the object of the *-isa-* form must be definite, and a more "emphatic" reading can be construed (see 13b below).

(13) a. *la   a   Xwaan k-ø-u-loq'-aj   la   ali Maria*
DET MASC John   PFV-3SG.B-3SG.A-love-SM DET FEM Maria
'John loves Maria'

b. *la   a   Xwaan k-ø-u-loq'-**isa**-aj   la   ali Maria*
DET MASC John   PFV-3SG.B-3SG.A-love-CAUS-SM DET FEM Maria
'John (really) loves Maria'

Summing up, *-isa-* causatives in K'iche' can have:
– Group 1: causative meanings with (internally-caused) S_O verbs, as well as applicative meanings with S_O verbs of emission with a dative goal
– Group 2: iterative/intensive meanings with A verbs
– Group 3: near-equivalent meaning with psych A verbs
Within the iterative/intensive meanings, the verbal semantics of the base verb will determine the semantics of the derived *-isa-* form, resulting more precisely in iterative, intensive, multiple object, or durative readings. As we shall see, the K'iche' situation seems to parallel very closely the situation in some ancient IE languages, especially Latin.

4 The synchronic situation in Core IE: Greek, Latin, and Vedic

4.1 *Changing valency in PIE*
Before we go into the synchronic analysis of *CoC-éye/o-* forms in some daughter languages, it is important to say something about valency-changing processes in PIE. Traditionally, Indo-Europeanists speak of valency with respect to two morphological categories, one derivational and one inflectional. The former category is precisely the causative; the latter (which as we shall see, adds a layer of complication to our analysis) is the middle.[11]

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11   There are of course other strategies by which the individual languages might carry out valency-changing derivations. Prefixation is a common strategy (for this process in Vedic, see Kulikov 2012). Object incorporation, as illustrated by the relationship between Gk. οἶνον χέω 'I pour wine' (transitive) → οἰνοχοέω 'id.' (intransitive; οἰνο- here is non-referential) is another (note that Greek cannot be said to have a *direct* object incorporation process, because the derivation above is mediated by the creation of the nominal compound

In fact, one could say that PIE had two "dials" for valency within its verbal system. One can increase valency by adding an affix to the verbal stem (as with *CoC-éye/o-* forms). Or one can decrease or increase valency by selecting middle endings vs. active endings. In several ancient IE languages, the two "dials" can sometimes work at cross-purposes, effectively cancelling each other out. Observe the following example from Greek:

(14) a. *phéb-o-mai*
          fear-TV-1SG.MID.NP
          'I flee; I am afraid'

     b. *phobé-ō*
          fear.CAUS-1SG.ACT.NP
          'I make X flee'

     c. *phobé-o-mai*
          fear.CAUS-TV-1SG.MID.NP
          'I flee; I am afraid'

In section 4.4 below, we will encounter some similar examples from Vedic, in which a causative derivation arguably takes a middle (i.e., decreased valency) form as a base, thus resulting in a formation identical in valency to the plain active form.

A second methodological point has to do with the distinction between unaccusative and unergative verbs in PIE. As we have seen, this distinction is often crucial for causative formations cross-linguistically. However, not all languages sort the same types of verbs into unaccusatives and unergatives in the same way, and even within the same language, verbs with very similar meanings can be treated differently.[12]

οἰνοχόος 'cup-bearer'). As mentioned in footnote 1 above, other present-forming suffixes can also function as valency-changing derivations in some daughter languages. More recent works on valency in PIE have focused on the concept of *basic valency orientation* (after Nichols, Peterson, & Barnes 2004), which aims at sorting languages based on whether they treat transitive or intransitive verbs as basic or derived; in this direction, see Kulikov (2009) on Old-Indo-Aryan, Luraghi (2012) on Old Hittite, Nichols (2006) on Old Church Slavonic, Plank & Lahiri (2015) on Proto-Germanic, and Sausa (2016) on Homeric Greek.

12   For instance, the Italian *passato prossimo* selects either *have* or *be* as auxiliaries based on whether a predicate is agentive (A, S_A) or not (S_O). The distinctions can be quite fine-

For this reason, it would be useful to have some morphological/syntactic language-internal criterion to distinguish the two types. Among old IE languages, the most forthcoming with this type of information happens to be Hittite, which displays a *split-S system* when it comes to its morphosyntax (Garrett 1996). This system can be observed in two places: (1) only unaccusative verbs (S_O) receive a subject agreement clitic (3sg.animate *-aš*; 3.sg.inanimate *-at*; 3pl. *-e*) in the sentence-initial clitic chain; (2) only unaccusative verbs receive 'be' as an auxiliary when forming the periphrastic perfect (unergative and transitive verbs receive 'have' as an auxiliary instead).

(15) a. *EGIR-pa=ma=**aš*** ^{URU}*KÁ.DINGIR.RA pait*
      afterward=ptc=3SG.UNACC.NOM city of Babylon go.3SG.ACT
      'Afterward **he** went to Babylon.' (KBo 3.1 i 28)

(16) a. *mahhan=kan MUNUS ŠU.GI mugauwanzi ašnuzi*
      when=PTC woman old invoke.INF finish.3SG.ACT
   b. *nu aruwaizzi.*
      SP bow.3SG.ACT
      'When the Old Woman finishes invoking (the deity), (she) bows down.' (KUB 17.23 i 1–2)

(17) a. *n=**aš**=za* *duškiškiwan dāiš*
      SP=3SG.UNACC.NOM=PTC rejoice.INF put.3SG.ACT
   b. *nu 3=ŠU palwait.*
      SP 3=TIMES shout.3SG.ACT
      '**He** began to rejoice and (he) shouted three times.' (KUB 33.106 iv 15–16)

Note how the verbs 'go' in (15a) and 'rejoice' (in 17a) trigger the 3sg. subject agreement clitic *-aš*, while the verbs 'bow' (in 16b) and 'shout' (in 17b) do not. If we base ourselves on Hittite (cf. Garrett 1996), we can infer that the following verb meanings are likely to be treated as non-agentive (S_O) in IE:
a.   middle decausatives (*be hit*)
b.   middle reflexives (*wash oneself*)
c.   changes of state (*become unfree, die*)

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grained. Motion verbs, for instance, are split between the two categories: *walk*, a manner of motion verb, is treated as unergative (*ho camminato* 'I have walked'); *go*, a direction of motion verb, is treated as unaccusative (*sono andato* 'I have gone').

d.   stative verbs (*lie*)

e.   psych verbs (*fear*) (used intransitively)

f.   direction of motion verbs (*come, go*)

g.   manner of motion verbs (*walk, run*)

h.   other (*fart, become satisfied with food/drink*)

For convenience, we can narrow the list down to the following (cf. Hoffner & Melchert 2008: 280–81):

a.   canonical S_O verbs (the subject is not agentive)

b.   psych verbs

c.   motion verbs

d.   verbs of emission

e.   verbs of ingestion

Of course, these criteria will not always work: languages can innovate, and there is no guarantee that Hittite always preserves the PIE situation unchanged.

For the individual languages treated here in detail (Latin, Greek, and Vedic) we can avail ourselves of some further tests, namely involving the capacity (or not) of given verbal roots to derive certain types of nominal formations. Specifically, Grestenberger (2018: 11–14) has shown that agent nouns in *-tár-* (Vedic), *-tḗr* (Greek), and *-tor* (Latin) are only formed to agentive verbs (S_A and A), and not to S_O verbs. A complementary diagnostic involves *-tá-* and *-tós-* verbal adjectives in Vedic and Greek respectively, which are usually formed to A and S_O verbs, but not to S_A verbs.[13] Of course, within closed-corpus languages, these types of tests can end up relying on negative evidence and might not be available for all the verbs studied. When all else fails, the general knowledge of what types of verbs are classified as S_O or S_A crosslinguistically should then serve us as a guide.

4.2   *Latin*

In Latin, a distribution similar to the one just described for K'iche' holds, and has been recently described by Kölligan (2007). Kölligan argues that, in Latin, the *agentivity* of the base verb determines the semantics of the *CoC-éye/o-* present. Thus, the *CoC-éye/o-* derivative to a non-agentive verb (S_O, in our terminology) will be causative/factitive in meaning; the *CoC-éye/o-* derivation to an agentive verb (A, S_A) will be iterative/intensive. These classes correspond to K'iche' Group 1 and Group 2 respectively, with the only difference that K'iche' does not allow causatives to S_A verbs, while Latin does.

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13   This is a well-known property of resultative participles cross-linguistically, see Haspelmath (1994: 157) with references.

Unlike K'iche', however, *CoC-éye/o-* presents are not a productive derivational type in Latin. The oppositions established by Kölligan normally hold between a *CoC-éye/o-* present attested in Latin and an intransitive verbal root reconstructed for PIE on the basis of comparative evidence (not necessarily attested in Latin). This indicates that the derivational type in itself was likely lost quite early in the prehistory of Latin, and arguably earlier than in the prehistory of Greek and Vedic, where synchronic alternations between a base verb and a derived *CoC-éye/o-* present can still be found. For this reason, Latin is of only limited utility when trying to establish what factors lead to the category's success or demise.

In what follows, I give the base verbal root as either attested in nominal formations in Latin or in verbal formations in other IE languages.[14] I will arrange the evidence in Groups 1, 2, and 3, just like for K'iche'.

TABLE 7   Group 1: Latin *CoC-éye/o-* causatives to PIE S_O base verbs[a]

PIE base verb (So)	Derived *CoC-éye/o-* causatives in Latin
terra 'dry land' < **ters-* 'to be dry'	*torrēre* 'to dry' < **tors-éye/o-* 'to make dry'
mens 'mind' < **men-* 'to think' (intr.)[b]	*monēre* 'to admonish, to remind' < **mon-éye/o-* 'to make think'
nex 'violent death' < **neḱ-* 'to die, disappear'	*nocēre* 'to damage' < **noḱ-éye/o-* 'to make die'

a Following Weiss (2016), I do not include the often-discussed Lat. *sōpiō* 'to put to sleep, to render unconscious' (traditionally taken as a causative to the PIE root **swep-* 'fall sleep') in this list, as it most likely reflects a denominative formation.

b For the unaccusativity of **men-*, see the LIV² glossing 'ein Gedanken fassen', as well as the absence of agent nouns built directly to the root. In Indo-Iranian, the only *-tar-* agent nouns attested to this root (reflecting P.IIr. **manáu̯tar-*) appear to be derived to a *-nu* present (thus a causative formation), which points to the non-agentivity of the simplex root. See the discussion in Tichy (1995: 40–41).

14   The data presented here is a small selection of that collected in Kölligan (2007). While I do not always agree with Kölligan's classification of forms under one heading or another, I find his overall analysis convincing. The forms I reproduce here are those whose classification I found most persuasive.

TABLE 8   Group 2: Latin *CoC-éye/o-* iteratives/intensives to PIE A base verbs

PIE base verb (A)	Derived *CoC-éye/o-* iteratives/intensives in Latin
Ved. *mr̥śáti* 'touches' < PIE **Hmelḱ-* 'to touch'	Lat. *mulcēre* 'to stroke' < PIE **Hmolḱ-éye/o-*
Gk. *téndō* 'I gnaw, nibble' < PIE **tend-* 'to cut'	Lat. *tondēre* 'to shear, to shave' < PIE **tond-éye/o-*
Gk. *spéndō* 'I libate' < PIE **spend-* 'to libate'	Lat. *spondēre* 'to vow, to promise' < PIE **spond-éye/o-*
Ved. *dáhati* 'burns (trans.)' < PIE **dʰegʷʰ-* 'to burn (trans.)'	Lat. *fovēre* 'to keep warm, to foster' < PIE **dʰogʷʰ-éye/o-*

In Group 2, note how, just as in K'iche', the *Aktionsart* of the base verb determines the semantics of the resulting iterative/intensive derivative. Thus a transitive, telic verb like 'touch', where an object is not being consumed, yields an iterative reading on a single object ('to stroke, to touch repeatedly'), while a transitive, telic verb like 'cut', where an object is being consumed, yields a multiple object reading ('to shear, to shave' is to cut many individual hairs). We can contrast this with the morphologically non-causative Gk. *téndō* 'I gnaw, nibble', which has independently developed an iterative reading, but on a single object.

A particularly interesting case concerns the *CoC-éye/o-* present of the PIE transitive root **h₂el-* 'feed, nourish', which results in an applicative derivation (examples from Kölligan 2007: 53).

Base form (transitive)

(18) *ignem   alere*
     fire.ACC.SG feed.INF
     '**feed** the (sacrificial) fire' (with offerings, for a deity)

"Causative" form (Applicative):
With object of the substance burned

(19) *verbēnās-que   adolē   pinguīs*
     olive.twig.ACC.PL-and feed.CAUS.IMP.2SG fat.ACC.PL
     '**burn** (feed to the fire) fat olive twigs' (Verg. *Eclogae* 8.65)

With object of the worshipped

(20) *flammīs*   **adolēre**   *penātēs*
flame.DAT.PL feed.CAUS.INF ancestor.ACC.PL
'**feed** the ancestors with flames' (Verg. *Aeneid* 1.704)

With object of the place of worship

(21) **adolent**-*que*   *altāria*   *dōnīs*
feed.CAUS.3PL-and altar.ACC.PL gift.DAT.PL
'they **feed** the altars with gifts' (Lucr. 4.1237)

Finally, for some verbal roots, only the *CoC-éye/o-* form seems to have survived, and is now on the way to becoming the main transitive (and sometimes intransitive) verb. We can call these verbs Group 3: Latin *CoC-éye/o-* forms which are equivalent to the PIE base verb. There are two ways to interpret these examples: either these were derived causative formations which underwent semantic bleaching and gradually started to take over the functions of the original base verb (as with English *lay* vs. *lie*), or possibly these were never actually derived causative formations, but (perhaps denominative) formations that happened to look like *CoC-éye/o-* causatives. In Table 9 below, *domāre* arguably belongs to the latter type (see discussion in section 6 below), and *movēre* to the former.

TABLE 9   Group 3: Latin *CoC-éye/o-* forms which are equivalent to the PIE base verb

PIE base verb	Derived *CoC-éye/o-* forms in Latin
Gk. *dámnēmi* 'I tame, I overcome' < PIE **demh₂-* 'to tame'	Lat. *domāre* 'to tame' < PIE **domh₂-éye/o-* (?)
Ved. (AV+) *mī́vati* 'pushes' < PIE **myeuH-éye/o-* 'to move (trans./intrans.)'	Lat. *movēre* 'to move (intr./trans.), to dance' (intr.)[a] < PIE **myouH-éye/o-* 'to move (trans.)'

a   Note that the meaning *to dance* should not be viewed as iterative here, but simply as reflexive (as in *to move onself*). The reflexive (thus, valency-reduced) reading is also supported by the middle morphology (*movēri* vs. *movēre*). Cf. the example: *Ut festīs mātrōna movērī iussa diēbus* 'As the matron who is told to dance (i.e., to move herself) on festival days' (Hor. *Ars Poetica* 232).

In short, within Shibatani & Pardeshi's model, the Latin situation seems compatible with that of a causative formation which has crossed the single-event line, and thus undergone the causative/non-causative split (just as in K'iche'). At some point during the prehistory of Latin, the derivation stopped being productive, and survived lexically only for some verbs, as a present formant.

Summing up, *CoC-éye/o-* forms in Latin can have:

a.   Group 1: causative meanings with S_O verbs.
b.   Group 2: iterative/intensive meanings with A verbs, as well as applicative meaning with the A verb *h_2el-* 'feed, nourish'.
c.   Group 3: meaning equivalent to their PIE base with some (non-psych) A verbs.

In the section on Greek below, we will see how the problem of *CoC-éye/o-* presents "look-alikes" (i.e., presents that look like *CoC-éye/o-* presents, but have different origins and thus aberrant semantics), which is arguably small for Latin, becomes rather substantial for Ancient Greek. Here, these "look-alike" formations contribute to muddling the synchronic function of *CoC-éye/o-* presents, and arguably accelerate their loss as a category.

4.3   (*Homeric*) *Greek*

Ancient Greek seems to preserve a somewhat more transparent system of causative derivation than Latin does. Here too, the *CoC-éye/o-* derivation is not synchronically productive.[15] Still, at least in the language of Homer, we can find several pairs made up of a base verb and its *CoC-éye/o-* counterpart. Of these, some behave as in K'iche' and Latin and show the causative/non-causative split, with non-agentive bases deriving causative readings, and agentive bases deriving iterative/intensive readings (corresponding to Groups 1 and 2 respectively). Often the split involves some more lexicalized meanings for the *CoC-éye/o-* counterpart (as opposed to the base verb). This is the case for the PIE agentive root *b^her-* 'carry':

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15   At the same time, a new, syntactic causative construction, using the verb ποιέω *to make*, is attested already in the language of Homer: ἐπεὶ ἄρ σε θεοὶ **ποίησαν** ἱκέσθαι/οἶκον ἐϋκτίμενον καὶ σὴν ἐς πατρίδα γαῖαν· (*Od.* 23.25–26) 'But the gods **made you reach** your well-built home and your fatherland'.

CARRY VS. WEAR

(22) a. *phérō* 'I carry' < PIE **bʰer-*
     b. *phóreō* 'I wear, transport (the dead), transport on a chariot' < PIE **bʰor-éye/o-*

For other verbs, the *CoC-éye/o-* present and the base verb seem to be used interchangeably, with no perceptible distinction in meaning. This corresponds to Group 3 discussed for K'iche' and Latin above. In what follows, examples from Homer are given comparing a base verb (typically a *bhávati*-type formation with /e/ grade of the root) and its *CoC-éye/o-* derivative. As usual, the examples are sorted in Groups 1, 2, and 3.

Group 1. Greek *CoC-éye/o-* causatives to PIE S_O base verbs
FEAR (FLEE) VS. SCARE

(23) a. ὣς   Δαναοὶ   Τρῶας   μένον   ἔμπεδον
        hòs Danaoì   Trôas   ménon   émpedon
        so   Danaan.NOM.PL   Trojans.ACC.PL   waited.3PL.ACT.P   steadily
        οὐδὲ φέβοντο.
        oudè **phébonto**
        NEG   flee.3PL.MID.P
        So the Danaans waited steadily for the Trojans, and did not **flee**. (*Il.* 5.527)

     b. ὅς   τε καὶ ἄλκιμον   ἄνδρα
        ós   te kaì álkimon   ándra
        REL.NOM.SG and   strong.ACC.SG man.ACC.SG
        φοβεῖ
        phobeî
        flee.CAUS.3SG.ACT.NP
        ['but the mind of Zeus is always stronger than men:]
        (Zeus), who **scares** even the courageous man' (*Il.* 16.689)

Group 2. Greek *CoC-éye/o-* iteratives/intensives to PIE S_A/A base verbs
CARRY VS. WEAR

(24) a. *phére* 'he carried'

φέρε καμπύλα τόξα
phére kampúla tóksa
carry.3SG.ACT.P curved.ACC.PL bow.ACC.PL
'he **carried** the curved bow' (*Il.* 12.372)

b. *phoréeske* 'he wore'

θώρηξ / χάλκεος, ὃν φορέεσκε
thṓrēks khálkeos hòn **phoréeske**[16]
corslet.NOM.SG brazen.NOM.SG REL.ACC.SG carry.CAUS.3SG.ACT.P
'the bronze corslet, which he **was wearing**' (*Il.* 13.371–72)

Within Group 2, the difference between the *CoC-éye/o-* form and its S_A/A base verb is often more subtle, resulting in habitual readings.

CARRY AROUND VS. CARRY AROUND HABITUALLY
Both the base form (A) and the *CoC-éye/o-* form (also A) use active endings.

(25) a. *phéron* 'they carried around'

ἄνεμοι φέρον ἔνθα καὶ ἔνθα
ánemoi **phéron** éntha kaì éntha
winds.NOM.PL carry.3PL.ACT.P there and there
'the winds **carried** (the raft) around this way and that way' (*Od.* 5.331)

b. *phoréei* 'carries around (habitually)'

ἄνεμος ἄχνας φορέει
ánemos ákhnas **phoréei**
wind.NOM.SG chaff.ACC.PL carry.CAUS.3SG.ACT.NP
'the wind **carries** around the chaff' (usual activity) (*Il.* 5.499)

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16 Note that *phoréeske* is a so-called epic (Ionic) *-ske-/o-* imperfect derived from a base-form *phoréō* (a *CoC-éye/o-* present). Ionic *-ske-/o-* imperfects have iterative semantics, so what we could have here is a double-marked iterative. For a formal description of the category, see Rix (1976: 229) and more recently Zerdin (2000 & 2002).

FLY VS. FLY ABOUT, FLY ABOUT HABITUALLY

The base form (S$_A$) uses middle endings, as does the *CoC-éye/o-* form (also S$_A$).

(26) a. *pétontai* 'they fly (in a straight line)'
πέτονται   ἐπ' ὠκεανοῖο   ῥοάων
pétontai   ep' ōkeanoîo   rhoáōn
fly.3PL.MID.NP to   ocean.GEN.SG current.GEN.PL
'(the cranes) **fly** to the streams of the Ocean' (*Il.* 3.5)

b. *potôntai* 'they fly around'
ἔνθα   καὶ ἔνθα ποτῶνται   ἀγαλλόμενα
éntha kaì éntha **potôntai**   agallómena
here and there fly.CAUS.3SG.MID.NP rejoicing.NOM.PL
πτερύγεσσι
pterúgessi
wing.DAT.PL
'(birds) **fly around** this way and that way, rejoicing in their wings' (*Il.* 2.462)

c. *pōtônto* 'they flew'
λίθοι   πωτῶντο   θαμειαί
líthoi   **pōtônto**   thameiaí
stone.NOM.PL fly.CAUS.3PL.MID.P numerous.NOM.PL
'the stones **were flying about** in great numbers' (*Il.* 12.287)

ROAR VS. BUZZ

Both the base form and the *CoC-éye/o-* form are unergative (S$_A$). The base form uses active and middle endings interchangeably, while the *CoC-éye/o-* form only uses active endings. If anything, the base form seems to indicate a louder (more intense?) noise than the *CoC-éye/o-* form, though iterative or habitual meaning can be read in the latter (bees buzz constantly, while the roaring of a crashing wave can be seen as a one-time event).

(27) a. *brémei* 'roars'
χέρσῳ   ῥηγνύμενον   μεγάλα βρέμει
khérsōi   rhēgnúmenon   megála **brémei**
land.DAT.SG breaking.ACC.SG loudly roar.3SG.ACT.NP
[Like a wave] 'breaking on land **roars** loudly' (*Il.* 4.425)

b. *brémetai* 'roars'

ὡς	ὅτε	κῦμα	πολυφλοίσβοιο	θαλάσσης	αἰγιαλῷ
hōs	hóte	kûma	poluphloísboio	thalássēs	aigialôi
as	when	wave.NOM.SG	sonorous.GEN.SG	sea.GEN.SG	coast.DAT.SG

μεγάλῳ	βρέμεται,	σμαραγεῖ	δέ	τε
megálōi	**brémetai**	smarageî	dé	te
long.DAT.SG	roar.3SG.MID.NP	resound.3SG.ACT.NP	PTC	and

πόντος.
póntos
sea.NOM.SG

'Like the wave of the sonorous sea **roars** on the long coast, and the waters resound' (*Il.* 2.209–10)

c. *broméōsi* 'they buzz'

ὡς	ὅτε	μυῖαι	σταθμῷ	ἔνι	βρομέωσι
hōs	hóte	muîai	stathmôi	èni	**broméōsi**
as	when	fly.NOM.PL	stable.DAT.SG	in	roar.CAUS.3PL.ACT.NP

περιγλαγέας	κατὰ	πέλλας
periglagéas	katà	péllas
full.of.milk.ACC.PL	around	bucket.ACC.PL

'like flies **buzz (continuously)** in a stable around the buckets of milk' (*Il.* 16.641–42)

Group 3. *CoC-éye/o-* **forms which are equivalent to the base verb**
Many forms, however, do not fit in the system described so far. For some verbs, both *CoC-éye/o-* form and base form can be used interchangeably without a clear causative/iterative meaning. We can sort these items (as usual) into Group 3.

TABLE 10   Group 3: Greek *CoC-éye/o-* forms which are equivalent to their "base" verb

Base verb (A, S$_A$)	*CoC-éye/o-* forms (A)
Gk. *ékhō* 'I have (act.)'	Gk. *okheéō* 'I have' (*Od.* 1.197)
Gk. *trémō* 'I tremble (act.)'	Gk. *troméō* 'I tremble (act., mid.), I fear (act.)'
Gk. *pérthō* 'I sack (act.), I am sacked (mid.)'	Gk. *porthéō* 'I sack (act.)'
Gk. *trépō* 'I turn (A, S$_A$)'	Gk. *tropéō* 'I turn (A)' (*Il.* 18.224)

An even more paradoxical situation is illustrated by the verb TOIL/SUFFER below.

TOIL/SUFFER

Somewhat confusingly, the base form is transitive (A), the *CoC-éye/o-* form is intransitive (S$_A$). Both forms use middle endings (which could be responsible for the decreased valency of the *CoC-éye/o-* form, though clearly they did not have that effect on the base form). No clear iterative, intensive, or even habitual meaning (as expected from an agentive base verb) can be read into the *CoC-éye/o-* form. In example (28) below, note how the two expressions are formulaically very similar, and seem to amount to variants of the same formulaic expression.

(28) a. *pénonto* 'they suffered'

Ὣς	οἳ		μὲν	τὰ	πένοντο	κατὰ
Hòs	hoì		mèn	tà	**pénonto**	katà
so	DET.NOM.SG	PTC		DET.ACC.PL	suffer.3PL.MID.P	by

στρατόν·
stratón
army.ACC.PL
'So they **were suffering** such things in the ranks' (*Il.* 1.318)

b. *ponéonto* 'they suffered'

Ὣς	οἳ		μὲν	πονέοντο	κατὰ	κρατερὴν
Hòs	hoì		mèn	**ponéonto**	katà	kraterēn
so	DET.NOM.SG	PTC		suffer.CAUS.3PL.MID.P	by	terrible.ACC.SG

ὑσμίνην·
husmínēn
fight.ACC.SG
'So they **were suffering** in the bitter fight' (*Il.* 5.84)

Items belonging to Group 3 in Greek (one may label this "the noisy group") seem somewhat more numerous, and somewhat more puzzling than in Latin or K'iche'. What has happened here? There can be two routes for these "noisy" items to be created. The first route has already been mentioned for Latin (and PDE): simple lexicalization and semantic bleaching of *CoC-éye/o-* forms, which gradually replace their base verb. This route is plausible for some, but not all of the non-causative, non-iterative *CoC-éye/o-* formations in Greek. The second route is more "systemic" in nature, and offers potential insight in the development of the Greek verbal system overall. This allows us to add an interesting

wrinkle to Shibatani & Pardeshi's model, and to point out some factors that can help drive the lexicalization of a causative derivation.

As Tucker (1990: 147–61) has argued, many Greek verbs that formally fit the *CoC-éye/o-* template are in fact inner-Greek creations, derived from nominal bases with an /o/ vowel in the root. Sometimes, it is actually hard to tell whether a *CoC-éye/o-* formation is deverbal or denominal, since /o/ grade nominal stems are attested for many of the verbs mentioned above as well (for Group 1, for instance, one can list the nominal stems φόβο- for 'fear', πόνο- for 'suffer', and φορευ-/φορο- for 'carry'). For our purposes, I collect below only the cases where I believe nominal derivation is the most likely option, since we have no attested /e/ grade present in Greek (which seems to otherwise be the norm for the formations seen so far), and a causative/iterative meaning seems absent from the *CoC-éye/o-* form. One should note that these "likely" cases of nominal derivation are the minority: for most *CoC-éye/o-* forms in Homer, denominative and deverbative derivation are both plausible options, given how widespread /o/ grade nominal formations are in the language. For a case like TOIL/SUF-FER above, we might argue that a denominal derivation is more likely on the grounds that the resulting semantics is unlike what we normally expect from a deverbal derivation.

In other words, Greek created a number of new *CoC-éye/o-* formations that had nothing to do with the causative or iterative, and which were based on nominal stems instead (for a discussion, see again Tucker 1990). Over time, this injection of denominal *CoC-éye/o-* forms was bound to interfere with the perceived semantics of the *CoC-éye/o-* category in Greek as a whole, making it harder for speakers to determine its function, and thus likely accelerating the lexicalization of its members.

We can thus tell the story of the category as a whole as follows. At some point in the prehistory of Greek, the *CoC-éye/o-* present moved past the single-event line and underwent the causative-non causative split. Remains of this system are still visible in Homer, where we find some base verb/"causative" pairs that behave predictably (causative meaning with S_O, non-causative meaning with S_A/A). However, beginning already in the language of Homer, other pairs underwent levelling due to system-internal pressures that applied to the Greek verbal system. As discussed by Tucker (1990), Greek created some large conjugational classes based on the phonological shape of the present stem (among which the so called *verba vocalia*, i.e., the *-éō* conjugation, *-áō* conjugation, *-úō* conjugation, and *-íō* conjugation). The old *CoC-éye/o-* formations were assigned to the *-éō* conjugation, together with many other transitive and intransitive formations and newly created denominal verbs of various valency. This formal grouping obscured the original function of the category,

TABLE 11   Greek *CoC-éye/o-* forms derived from a nominal base (with no corresponding /e/ grade present in Greek)[a]

Greek base noun	Derived *CoC-éye/o-* form
ὁ νόο- 'thinking, mind'	νοέω 'I think, I intend' (A, S_A)
ὁ πόθο- 'longing' (*Il.* 17.439)	ποθέω 'I long for, I miss'[b]
ὁ φθόνο- 'envy, ill-will'	φθονέω 'I begrudge'
ὁ εἰροκόμο- 'wool-worker' (*Il.* 3.387)	κομέω 'I tend, to take care of' (*Od.* 17.310)

a   Interestingly, many of these arguably denominal verbs still largely seem to fit in the seman-tic categories that we would expect for "causatives that do not cause" crosslinguistically: in Table 11, 'think', 'long for', and 'begrudge' are all psych verbs (for which, as we have seen in K'iche', a causative derivation would not necessarily result in a causative/iterative meaning, which is in fact absent here). This may just be a coincidence. Alternatively, this could indicate that these forms were indeed deverbal *CoC-éye/o-* formations to psych (A) verbs in the pre-history of Greek, which, just as in K'iche', were virtually identical in meaning to their bases. In time, the *CoC-éye/o-* formations came to completely replace their base verb, which is thus unattested in our Greek sources. This solution, while not implausible, is perforce more spec-ulative.

b   For this PIE root (*$g^{wh}ed^h$-* 'to ask, to wish'), an /e/ grade verbal formation is indeed attested a handful of times in Greek poetry (though not in Homer): this is the aorist θέσσασθαι 'to beg, to implore'. Hesychius also reports a present infinitive θέσσεσθαι. It is unlikely, however, that this form would have been synchronically associated with ποθέω by Greek speakers, given the phonological dissimilarity resulting from the treatment of the initial labiovelar and from the operation of Grassman's Law.

and paved the way for the lexicalization of its high-frequency members, fol-lowed by its disappearance.

4.4   *Vedic*[17]

Vedic presents us with a situation very different from what has been encoun-tered so far in Greek, Latin, and even K'iche', pointing us to an opposite direc-tion of development along Shibatani & Pardeshi's causative continuum. First of all, the causative in Vedic is a productive derivation: though a few *CoC-éye/o-* formations do not have a corresponding intransitive base verb,[18] the vast major-

17   All Vedic translations are after Jamison & Brereton (2014).

18   Among the handful of *CoC-éye/o-* formations which do not stand in a derivational rela-tionship to intransitive verbs, four appear to be of Indo-Iranian date (Jamison 1983: 182), and one has an intransitive counterpart in Latin. The simplest interpretation is that these are stranded causatives, which used to take part in derivation, but have recently lost their bases to language change.

ity of them do: we have very many synchronic pairs of base verb/causative (cf. Table 12 on the following page). Second, also unlike Greek and Latin, Vedic does not show signs of the usual causative/non-causative split, and iterative/intensive meanings are not attested (Jamison 1983: 184–85). In a way, then, all *CoC-éye/o-* presents in Vedic can be said to belong to Group 1 (see below for some apparent exceptions). Interestingly, Vedic provides us with many examples of *CoC-éye/o-* presents to S_A bases, which were totally absent in Latin (as well as in K'iche') and only very marginally attested in Greek (cf. example 26 above).

Causative meanings with S_O base verbs
SIT

(29) a. *sīdati* 'sits' < **Ci-CC-e/o-* (reduplicated present) < PIE **sed-* 'sit'
     b. *sādáyati* 'makes sit' < **CoC-éye/o-*

Causative meanings with S_A base verbs
HIDE

(30) a. *cátati* 'hides' < **CéC-e/o-* (thematic present)
     b. *cātáyate* 'makes hide' < **CoC-éye/o-*

BREATHE

(31) a. *prāṇiti* 'breathes' (= *pra- an(i)-*) < **CéC-* (athematic present)
     b. *prāṇáyati* 'makes breathe' < **CoC-éye/o-*

In fact, *CoC-éye/o-* causatives in Vedic are so numerous that it is impossible to list them all here. Table 12 below reproduces only a type of such causatives as established by Jamison (1983), namely, *CoC-éye/o-* causatives corresponding to an active unmarked present. *Hapaxes*, a sign of the productivity of the category (Baayen 1989; Sandell 2015), are marked in the table as well.

While this description holds for the Vedic corpus overall, the internal chronology might be more nuanced, at least if we follow a recent contribution by Kulikov (2013). Kulikov looks closely at *CoC-éye/o-* formations (as well as reduplicated aorists, which do not concern us here) to base verbs which sit on the border between S_O and S_A, namely verbs of (controllable) emission and perception (he includes verbs of ingestion too, which I will treat below). The main feature of these verbs is that they might or might not imply control of the action on the part of the subject/agent: for instance, one might *scream* intentionally

TABLE 12   Group 1: *CoC-éye/o-* causatives to S$_O$/S$_A$ base verbs with active, unmarked
presents from Jamison 1983: 105–20)[19]

Base verb	Derived *CoC-éye/o-* causatives
an 'breathe'	*prāṇáyati* 'makes breathe' (AV 1x)
r̥d 'shake violently'	*ardáyati* 'makes shake violently'
am 'beset, be vexing'	*āmáyati* 'makes beset, vexatious'
ej 'be in motion'	*ejáyati* 'sets in motion'
krand 'roar; race'	*krandayati* 'makes roar (RV 1x); makes race'
kṣi 'dwell in peace'	*kṣayáyati* 'makes dwell in peace' (RV 1x)
ghuṣ 'listen, heed'	*ghoṣáyati* 'makes listen, makes heed'
cat 'hide'	*cātáyate* 'makes hide'
jīv 'live'	*jīváyati* 'makes live' (RV 1x)
tras 'tremble'	*trāsayati* 'makes tremble' (AV 1x)
dru 'run'	*drāváyati* 'makes run'
dhāv 'run'	*dhāváyati* 'makes run' (RV 1x)
dhvan 'smoke, be smoky'	*dhvānayati* 'makes smoky, envelops with smoke' (RV 1x)
pat 'fly'	*pātáyati* 'makes fly'
bhū 'become'	*párā bhāvayati* 'makes perish'
mad 'be exhilarated'	*mādáyati* 'exhilarates'
mih 'urinate'	*mehayati* 'makes urinate' (RV 1x)
rud 'weep'	*rodayati* 'makes weep'
ruh 'ascend'	*roháyati* 'makes ascend'
lap 'cry out'	*ví lāpayati* 'makes cry out'
vr̥ṣ 'rain'	*varṣáyati* 'makes rain'
vas 'dwell'	*vāsáyati, -te* 'makes dwell'
śr̥dh 'be strong, audacious'	*atipraśardháyati* 'makes strong, audacious' (RV 1x)
śuc 'shine, gleam'	*śocáyati* 'makes shine, gleam'
śvas 'snort'	*śvāsayati* 'makes snort, rumble' (RV 1x)
stubh 'chant'	*stobhayati* 'makes chant'
snā 'bathe'	*snāpáyati* 'makes bathe' (RV 1x)
sphūrj 'rumble'	*sphūrjáyati* 'makes rumble' (RV 1x)
sru 'flow'	*srāvayati* 'makes flow'
svap 'sleep'	*svāpáyati* 'makes sleep'

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19   The reader can consult Jamison (1983: 105–77) for a detailed discussion of each item
(including the possible development of secondary meanings), as well as for a full list of
all types of *CoC-éye/o-* causatives in Vedic.

or unintentionally, and similarly one might passively *perceive* or actively *look*.
In the first case, the verb would be unaccusative (S_O); in the second, it would be
unergative (S_A). According to Kulikov, only later Vedic creates real causatives to
these verbs, meaning 'to cause to do X'. In earlier Vedic, the rare occurrences of
CoC-éye/o- formations to these bases do not result in a real causative reading,
but only in increased agentivity (= control) of the subject, effectively selecting
the S_A reading over the S_O reading. In later Vedic, this same derivation would
have real causative reading.

Unfortunately, clear examples with a *CoC-éye/o-* present are few (Kulikov
presents more examples with the reduplicated aorist). The best seems to be the
following (2013: 86), contrasting a *CoC-éye/o-* present to the root *krand-* 'roar'
in an early book of the Rigveda, yielding a simple S_A reading vs. one in a later
book, yielding a real causative reading.

(32) *ā́ **krandaya**   balam*
      to roar.CAUS.2SG.ACT.IMP strength.ACC.SG
      '**roar out** your strength' (RV.6.47.30)

(33) *ny   **àkrandayann**   upayánta   enam [...]*
      down roar.CAUS.3PL.ACT.P approaching.NOM.PL this.ACC.SG
      vṛṣabhám
      bull.ACC.SG
      'the approaching ones **have made him roar**, the bull' (RV.10.102.5)

A possible example of a *CoC-éye/o-* present to a perception verb selecting a sim-
ple S_A reading in an early book of the Rigveda can be seen with the root *spaś-*
'look, watch' (Kulikov 2013: 97–98):

(34) ***spāśáyasva***   yó   asma-dhrúk*
      watch.CAUS.2SG.MID.IMP who.NOM.SG us-deceptive.NOM.SG
      '**Watch** the one who is deceptive towards us' (RV.1.176.3)[20]

In short, Kulikov's work might show that, while Vedic reflexes of *CoC-éye/o-*
causatives to S_O bases are clearly old, extension of this formation to S_A verbs
could have happened gradually and within the history of Vedic. At first, these
CoC-éye/o- derivatives to S_A verbs would simply increase agentivity, thus being

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20   The translation of this passage is debated, with Jamison & Brereton (2014) printing "Cause
      our deceiver to be spied out" instead.

near-synonymous with their base-forms, and giving rise to a situation superficially similar to Groups 3 in K'iche', Latin, and Greek. Only at a later time would these formations acquire true causative meaning.

In the later language, *CoC-éye/o-* formations are extended to several A verbs as well.[21] The traditional account is that this extension occurs in the later portions of the *Rig Veda* with verbs of ingestion, which can be used transitively (A, with the accusative) or intransitively (S_A, with the genitive) and as such can function as pivots between the two categories (see Jamison 1983: 187–89).[22] Similar conclusions are also reached by Hock 1981, expanding upon Cardona (1978).[23]

Causative meanings with S_A/A base verbs (more frequent in the later language)
PARTAKE OF

(35) a. *bhájate* 'partakes of' < **CéC-e/o-* (thematic present)
      b. *bhājayati* 'makes partake of' < **CoC-éye/o-*

DRINK

(36) a. *píbati* 'drinks' < old reduplicated present to PIE **peh₃(y)-* 'drink'
      b. *pāyáyati* 'makes drink' < **CoC-éye/o-*

(37) *uśán*   *devā́m̐s*   *uśatáḥ*   **pāyayā**
      willing.NOM.SG god.ACC.PL willing.ACC.PL drink.CAUS.2SG.ACT.IMP
      havíḥ
      offer.ACC.SG
      '(O Agni) eagerly **make** the gods eagerly **drink** the oblation' (RV.2.37.6d)

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21   For a list (including evidence from the *Atharva Veda*), see recently Lazzeroni (2009: 8–10), who cites Tichy (1980).

22   Note that subjects of verbs of ingestion are *affected* (similar to subjects of psych verbs and verbs of perception, which are effectively *experiencers*), which again makes them less prototypically transitive. Vedic is not unique here: for a discussion of verbs of ingestion (*ingestives*, as per Masica 1976) and their peculiar relationship to causative formations cross-linguistically, see Shibatani & Pardeshi (2001: 145–47). For an application of these insights to the analysis of the Vedic causative, see already Lazzeroni (2009).

23   These contributions attempt to tease out more specifically *which* transitive verbs were the first to be liable to causative derivation in the *Rig Veda* and in the later language. Regardless of the account, verbs of perception and ingestion (along with movement and speech) always seem to make the list.

With regard to the chronology of this extension, special discussion is warranted by PIE *wes- 'wear', a transitive middle verb (just like the verbs of ingestion just treated) which forms a *CoC-éye/o-* present in several branches of IE. This verb is of particular interest since its *CoC-éye/o-* formation is reconstructible for PIE (see footnote 2 above), and as such it could reflect a particularly deep archaism and a particularly early date for the extension of *CoC-éye/o-* presents to *some* transitive bases.

WEAR

(38) a. *váste* 'wears' < *CéC-e/o-* (thematic present)
     b. *vāsáyati* 'clothes' < *CoC-éye/o-*

(39) a. *bhāsāṃsi*   **vaste**   *sū́ryo*   *ná*
        light.ACC.PL wear.3SG.MID.NP sun.NOM.SG like
        'he **wears** lights, like the sun' (RV.6.4.3b)

     b. *tám*   *gīrbhíḥ* [...]   **vāsayāmasi**
        he.ACC.SG   song.INSTR.PL   **wear.CAUS.1PL.ACT.NP**
        'Him we clothe with songs' (RV.9.35.5ab)

As pointed out by Jamison (1983: 133), we can contrast the argument structure for base form *váste* (which takes the accusative of the garment) and the *CoC-éye/o-* present *vāsáyati* (which takes the accusative of the person clothed and the instrumental of the garment).[24] Indeed, it is not surprising that such a verb would derive a particularly old *CoC-éye/o-* present, despite its seeming transitivity. As mentioned above, verbs of garment, just like verbs of ingestion, are *middle verbs*, and as such can be considered a liminal category between transitive and intransitive. They are defined by having a subject which is also an undergoer, much like canonical S_O verbs. As we shall see below, it is not unreasonable to suggest that PIE had already started extending *CoC-éye/o-* forma-

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24   Perhaps interestingly, in Greek, a similar "causative" alternation for this root is implemented (at least formally) between the inherited /e/ grade present εἷμαι (synchronically working as a perfect) and the nasal present ἕννυμι. Yet, no difference in argument structure is traceable between the two formations: they both mean 'clothe' in the active and 'wear' in the middle, and they both take the accusative of the garment (the reading 'clothe' adds an accusative of the person/thing clothed as well). Unfortunately, this is not among the roots treated in Covini (2017), whose selection is limited to non-agentive bases.

tions with causative meaning to verbs of this type (likely even before extending them to S_A verbs, which seems to be a language-internal innovation).

At times, *CoC-éye/o-* formations in Vedic are in competition with other transitive active presents which existed in opposition to middle intransitives. This gives rise to couplets such as: *ajanat* (RV.3.31.15c)/*ájanayat* (RV.2.19.3c) 'to beget', *yatati* (RV.7.36.2d)/*yātayati* (RV.3.59.1a) 'to set/put', *vardhanti* (RV.7 .12.3b)/*vardháyanti* (7.77.6ab) 'to strenghten', and *códat* (RV.7.27.3d)/*codaya* (RV.1.9.5a) 'to impel' (all discussed in Jamison 1983: 184), in which the *-áya-* formation appears to be functionally identical to a transitive form (thus resembling Group 3 formations in K'iche', Latin, and Greek). I follow Jamison in regarding these formations as causatives derived to an intransitive base (i.e., a middle present form), and thus not constituting an exception to my account. The derivations are below:

(40)   *janáyati*, derived to S_O *jā́yate* 'be born' (op. cit.: 154)
         yātáyati, derived to S_O *yátate* 'to be in place' (op. cit.: 131)
         vardháyati, derived to S_O *várdhate* 'to increase, grow' (op. cit.: 157–58)
         codáyati, derived to S_O *códate* 'to be impelled' (op. cit.: 153)

Summing up, the Vedic *CoC-éye/o-* present seems to be moving to the right of the single event line, and it is increasing, not decreasing in productivity (as witnessed by the large number of *hapax legomena*).

We might ask what systemic factors might have contributed to this development. As in Greek, inherited *CoC-éye/o-* formations in Vedic have been assigned to a very large conjugational class for present stems (class X, or *-áya-* presents),[25] which comprises both intransitive and transitive verbs. Unlike in Greek, however, *CoC-éye/o-* formations with causative meanings managed to remain formally and functionally distinct within their conjugational class. First, their phonological shape (with a heavy root syllable resulting from the /o/ grade in the root) kept them formally distinct from intransitive *-áya-* presents (with a light root syllable).[26] Second, *CoC-éye/o-* causatives constituted the most numerous group within class X. These factors arguably helped the category to maintain its integrity, and to expand even further, resisting those forces which had contributed to the demise of the Greek causative.

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25   The classic study on the category is Jamison (1983: 48–69).
26   These are treated in Jamison 1983: 48–69.

5   A note on Proto-Germanic

While a treatment of the Germanic evidence for *CoC-éye/o-* presents goes beyond the scope of the present paper (for a full treatment of the Gothic and Old English evidence, see respectively García García 2005 & 2012), it is useful to review some general facts about this formation in Proto-Germanic before moving to our conclusions.

Overall, the Proto-Germanic evidence aligns well with the late Vedic situation, showing a productive use of the causative and no causative/non-causative split. That is to say, no *CoC-éye/o-* presents with *clear* iterative meaning can be reconstructed for Proto-Germanic (for a discussion, see García García 2005: 41–44).[27] Just as in late Vedic, *CoC-éye/o-* presents can be formed to S_O and S_A base verbs (with S_O representing a majority), as well as to some A base verbs. García García (2005: 38) has already pointed out that the verbs serving as bases for *CoC-éye/o-* causatives in Germanic align precisely with the typologically common semantic bases for morphological causatives identified by Shibatani

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27   A reviewer draws my attention to the debated topic (briefly touched upon in Ringe 2017: 283) of whether some iteratives might still be reconstructed for Proto-Germanic; the reviewer generously provides a potential list thereof, which I partially reference below. Of course, this is a matter which would deserve more extensive treatment. In short, an iterative is sometimes posited for Proto-Germanic (in IEW and much less often in LIV) when a transitive verb showing *CoC-éye/o-* morphology in the Germanic languages is not clearly causative in meaning (it mostly seems synonymous with its transitive PIE base). Crucially, in the languages in question, the *CoC-éye/o-* form does not exist next to a simplex base verb (which would point to a synchronically productive derivation in any of the languages), but is effectively the only verbal descendant of that root. This is the case, for instance, for two Germanic formations classified as iterative in the LIV. One involves the transitive root *merh₂-* 'gewaltsam packen, zerdrücken', attested with *CoC-éye/o-* morphology in ON *merja* 'schlagen, zerschlagen'. Note that the glosses (all amounting to 'hit, crush') are effectively synonymous. Another example is the transitive root **kes-* 'arrange, put in order'. Here the Goth. *CoC-éye/o-* formation *hazjan* 'praise (= arrange words in a hymn)' shows a specialization and a shift in meaning (and not one having to do with iterativity), but no change in transitivity. Another possible example (not given as such in LIV) is the transitive root **gleu̯bʰ-* 'deepen, carve, cut', attested with possible *CoC-éye/o-* morphology in OHG as *klioban* 'split, cleave', OE *cléofan* 'id.,' and ON *kljúfa* 'id.' (still transitive). Here again, meaning and transitivity appear unchanged, and there is no clear iteration of the action.

       Rather than clearly displaying iterative semantics, these cases seem analogous to our Group 3 "*CoC-éye/o-* forms which are equivalent to the base verb." For them as well, my sense is that some secondary explanation is in order: either the causative verb has replaced its base in its original semantics, as is in progress with PDE *lay/lie*, or the actual derivational path is different (for ON *kljúfa* above, for instance, the LIV suggests a newly-built *-ye/o-* present with zero grade of the root).

TABLE 13   Group 1: Germanic *CoC-éye/o-* causatives and their base verbs (from Ringe 2017: 282–83)

Base verb type	Base verb	Derived *CoC-éye/o-* causatives
S_O	*brinnaną* 'burn'	*brannjaną* 'burn (trans.)'
S_O	*ligjaną* 'lie'	*laigijaną* 'lay'
S_O	*sitjaną* 'sit'	*satjaną* 'seat, set'
S_O	*frawerþaną* 'perish'	*frawardijaną* 'destroy'
S_O	*wak* 'be awake'	*wakjaną* 'awaken (trans.)'
S_O/S_A	*nesaną* 'survive'	*nazjaną* 'save'
S_O/S_A	*hlahjaną* 'laugh'	*hlōgijaną* 'cause to laugh'
S_O/S_A	*grētaną* 'weep'	*grōtijaną* 'cause to weep'
S_A	*rīsaną* 'rise'	*raizijianą* 'raise'
S_A	*faraną* 'travel, go'	*farjaną* 'carry across'
A/S_A	*etaną* 'eat'	*atjaną* 'cause to eat'
A/S_A	*drinkaną* 'drink'	*drankijaną* 'cause to drink'
A/S_A	*lais* 'knows'	*laizijaną* 'teach'

(2002: 6).[28] Among the examples reported by Ringe (2017: 282–83) for Proto-Germanic, the only A base verbs with a *CoC-éye/o-* present are *eat*, *drink*, and *know* (two middle verbs of ingestion and one psych verb); to these one should add *waz-janą* 'to clothe' (cf. footnote 2 above), another middle verb. This distribution seems to point once again to a restricted category of "liminal" A verbs (middle verbs and pysch verbs) functioning as possible pivots for the extension of the category beyond intransitive bases.

At this point, it seems possible to divide the old IE languages treated so far into two-types:

a.   those with a productive *CoC-éye/o-* formation and without the causative/non-causative split, like Germanic and Vedic;

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28   The specific semantic categorization of base verbs adopted by Shibatani and García García largely overlaps with, but is not identical to, the terminology used in this paper. Here I give their semantic categories with (in parentheses) the equivalent terminology used so far: (1) non-agentive intransitive verbs (= S_O) (2) middle verbs (= S_A/A, middle verbs), (3) ingestive verbs (= S_A/A, middle verbs), (4) agentive intransitive verbs (= S_A). Shibatani & Pardeshi (2001: 146) argue that ingestive verbs should be simply classified as middle verbs, instead of forming their own category.

b.   those with an unproductive *CoC-éye/o-* formation and showing the caus-
ative/non-causative split, like Greek and Latin.

It is only in the latter languages that iterative meanings are attested.

6   Reconstructing the PIE causative

This relatively brief survey of the Latin, Greek, Vedic, and Proto-Germanic sit-
uation allows us to distinguish two diachronic routes for the development of
CoC-éye/o- presents in IE, and for the causative more generally. Both of these
routes move along Shibatani & Pardeshi's causative continuum, only in oppo-
site directions. Again, this bidirectionality speaks against labelling the contin-
uum a *grammaticalization path*, at least if we take unidirectionality as part of
the definition of grammaticalization.

Overall, productivity seems to be the factor determining the direction of
development, with increasing productivity leading rightwards along the con-
tinuum (towards "grammaticalization"), and decreasing productivity leading
leftwards (towards lexicalization). The development of iterative/intensive
readings happens along the lexicalization pathway, and takes place when a
formation crosses to the left of the single event line. As illustrated above, the
development of these non-causative readings is highly sensitive to the verbal
semantics of the base verb, with multiple object, habitual, and durative read-
ings also being possible.

At the PIE level, we can then safely reconstruct *CoC-éye/o-* presents derived
to S_O bases (and possibly only internally-caused S_O bases), yielding *causative*
meanings. This seems to have been the core function of the category, attested in
all of the daughter languages. Thanks to the Anatolian evidence (cf. fn. 2 above),
we can reconstruct the present stem *louk-éye/o-* 'to make shine', from the PIE
S_O base *leuk-* 'to shine' (an internally-caused S_O verb) as one of the certain PIE
examples for this category. On the other hand, *CoC-éye/o-* presents did not have
iterative meaning in PIE, as this appears to be a development attested only in
languages (like Greek and Latin) where *CoC-éye/o-* presents became unproduc-
tive and underwent the causative/non-causative split.

Going further, we might ask whether the extension of *CoC-éye/o-* presents to
S_A and A bases was a post-PIE innovation, which took place at different times
and to different degrees in all daughter languages, or whether it was already
beginning in PIE.

For a PIE date of the extension to at least *some* A bases (and specifically,
transitive bases with an affected subject) speaks the equation of Hitt. *waššezzi*
'clothes (someone)', Ved. *vāsáyati*, Goth. *wasjiþ* (PGmc. **waz-jan*, also Eng.

wear), and Alb. *vesh*, pointing to a PIE present **wos-éye/o-* made to a root **wes-* 'wear', a middle transitive predicate discussed in section 4 above. Middle verbs (like verbs of ingestion and wearing) and psych verbs are likely to have been the first targets of the extension, because of their liminal status between intransitivity and transitivity. If this is correct, one might say that *CoC-éye/o-* presents in PIE were formed to predicates (transitive or not) *whose subject was also an undergoer.*

Against a PIE date of the extension to *all other sorts* of transitive/agentive bases speak the facts that (a) in Vedic at least, extension of *CoC-éye/o-* presents to *most* transitive roots appears to be a late, language-internal innovation, and (b) "identical" *CoC-éye/o-* presents to S_A roots can give rise to different meanings (causative vs. iterative) in the daughter languages. An example is the inherited S_A root **pet(H)-* 'to fly', which has an attested *CoC-éye/o-* present in both Greek and Vedic.[29] The semantics of this present are clearly distinct in the two languages, with Greek showing an iterative reading, and Vedic a causative reading:

(41) a. PIE **pet(H)-* 'fly' → Transponat **pot-éye/o-*
      b. Vedic *patáyati* 'fly' → *pātáyati* 'make fly' (causative)
      c. Gk. *pétomai* 'fly' → *potéomai* 'fly about, flutter' (iterative)

(42) a. Vedic *pātáyati* 'make fly'
          út **pātayati**   *pakṣíṇaḥ*
          up fly.CAUS.3SG.ACT winged.creature.ACC.PL
          'She (Dawn) **makes** the winged ones **fly** up' (RV.1.48.5d, tr. Jamison & Brereton 2014)

      b. Greek *potéomai* 'fly about, flutter'
          ἔνθα καὶ ἔνθα ποτῶνται   ἀγαλλόμενα
          éntha kaì éntha **potôntai**   agallómena
          here   and there fly.CAUS.3PL.MID.NP rejoicing.NOM.PL

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29   Note that this root (though mostly attested with the meaning 'flee' rather than 'fly') behaves as unaccusative in Hittite. Probative formations are not attested in either Greek or Vedic. However, treating *fly* as a unergative verb (under some conditions) is not unjustified. Among several modern languages, this verb can function as either unaccusative or unergative based on the perceived animacy of the agent (for Urdu/Hindi, with a discussion of Italian and German, see Ahmed 2010 with references). For instance, in terms of auxiliary selection, Italian allows for both *ha volato* 'has flown' and *è volato* 'id.'. Examples 42.a and 42.b (especially) are compatible with an agentive reading.

πτερύγεσσι
pterúgessi
wing.DAT.PL
'(birds) **fly around** this way and that way, rejoicing in their wings' (*Il.*
2.462)

Two interpretations are available here: either Vedic represents the original
(causative) meaning of a PIE-level *pot-éye/o-* and Greek has re-interpreted
that formation as an iterative once *CoC-éye/o-* presents crossed the single-event
line (note that while this development might seem plausible, it has yet to be
observed cross-linguistically), or else these are best regarded as two distinct
language-internal creations. While Kulikov's thesis discussed above could be
relevant to this point (arguing that only S_O bases were eligible for *CoC-éye/o-*
presents in PIE, and S_A bases represent a later innovation), the evidence is
limited, and one might therefore hesitate to base the PIE reconstruction upon
it.[30]

Finally, following this line of reasoning, we need a special treatment for
apparent *CoC-éye/o-* presents like Lat. *domāre* 'tame' and Goth. *ga-tamjan* 'id.,'
which could point to a PIE date for the extension of *CoC-éye/o-* causatives to
a larger category of transitive verbs (note that the base form *$demh_2$- 'to tame'
is already transitive, and that the subject is *not* affected). The issue here is that
these *CoC-éye/o-* presents are identical in meaning and argument structure to
their base form, and they show no trace of a causative or iterative semantics
(as one would expect from an agentive base in Latin or Greek).[31] One wonders
whether the best treatment for this data, in light of the discussion so far, is to
see these forms as denominal instead (which were secondarily grouped with
true *CoC-éye/o-* causatives because of their transitivity).[32]

Going forward, it would be desirable to investigate the exact pathways of
development for *CoC-éye/o-* causatives in all of the individual IE daughter lan-

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30   The problem, naturally, is that most evidence regarding *CoC-éye/o-* formations to S_A bases
     in the daughter languages is negative in nature: in Greek and Latin, what we have is simply
     a dearth of examples. Typological data indicating that it is common for languages to limit
     their causative formations to S_O bases can support a reconstruction restricting *CoC-éye/o-*
     presents to S_O bases, but this does not amount to certainty.

31   Note that LIV[2] labels *$domh_2$-éye/o-* as an iterative formation, though it presents no evi-
     dence or argument for this choice (the glosses for the "iterative" forms are identical to
     those for the thematic aorist and for the nasal-infix present).

32   Alternatively, they could represent some isolated cases of an old causative morpheme
     being used as a simple transitive marker, which seems to parallel the fate of nasal presents
     in Vedic (per Zasada 2020, discussed in section 2.3.2 above).

guages, especially in order to determine what phonological and morphological factors could have contributed to the rise or fall in productivity of *CoC-éye/o-* formations across the family. While the present contribution does not claim to be exhaustive, I hope it can nonetheless serve as yet another example of how linguistic typology and theory can help recast and untangle some classic problems of Indo-European reconstruction. While the topic of verbal valency has recently received more attention within the field (see the discussion in section 4.1. above), it is my conviction that a more thorough exploration of this area going forward holds the key to an improved and sharper picture of the reconstructed PIE verbal system.

Acknowledgements

Abbreviations[33]

=	(Hittite) clitic boundary
A	set A agreement clitics (ergative agreement)
B	set B agreement clitics (absolutive agreement)
IT	iterative
NP	non past
P	past
RN	relational noun

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33   Abbreviations in this document follow standard Leipzig glossing practice. Only special abbreviations are listed here.

SM   status marker
SP   sentence particle
TV   thematic vowel
UNACC   unaccusative

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