

# Adjectives exist, adjectivisers do not: a bicategorical typology

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**Abstract** This paper examines how adjectives are derived within a featural system comprising only two categories. It argues that adjectivisers, *a* heads, do not exist, leaving the repertory of categorisers with two members only: verbalisers, *v* heads, and nominalisers, *n* heads. We proceed to argue that the adjective category is possibly universal insofar as it involves *prima facie* dual categorisation: adjectives obtain when a root or an already categorised element combines with a complex categorial structure, one that involves both a verbaliser and nominaliser. This proposal is supported by grammar-internal evidence (*viz.* the external modification of adjectives by adverbs and the nominal character of their internal structure) and by broader typological facts (the distribution of which follows from our analysis). Several consequences and predictions are beneficially derived.

**Keywords:** adjectives; lexical categories; morphology; syntax; typology; Universal Grammar; categoriser

## 1 Introduction: ontology, categories, and the primitives of grammar

The research reported in this paper is framed within the general understanding that lexical categories are to be analysed in the spirit of Déchaine (1993), Baker (2003) and others: as being about interpretation, and not as

shallow taxonomic categories. Given the prominence and (near-)universality of the noun-verb distinction (Panagiotidis 2015: Ch. 3), this theoretical commitment is obvious if not necessary. For instance, we would not expect taxonomic categories like e.g. inflectional classes or even animacy and sex-based gender to be similarly (near-)universal – and they are not.

Thus, this understanding of lexical categories such as noun and verb as being about interpretation would go some way towards actually explaining their prominence cross-linguistically, let alone their purported universality (Baker 2003): they would be about something deeper than mere grammar-internal taxonomies. At the same time, such prominence would be a most curious fact also if, for instance, the verb-noun contrast were merely a morphological reflex of T features, as in Pesetsky & Torrego (2004). Indeed, relegating the noun-verb distinction to “facts about morphology” leads us to missing an important generalisation, possibly one that concerns a fundamental characteristic of natural language grammar: the (near-)universality of the noun-verb distinction.

We moreover subscribe to the view that categorisation is a necessary process (Embick & Marantz 2008: 6). The necessity of categorisation and the ban on free acategorial roots could result from the need to render roots readable at the interface with Conceptual-Intentional systems (Panagiotidis 2011, taking further afield the claim in Arad 2003: 741, 747), or in order to render roots visible at the onset of a derivational procedure (Mitrović & Panagiotidis 2018; harking back to Chomsky 2013), or maybe even both.

Finally, for the purposes of this investigation into the nature of adjectives we posit that verbs and nouns are universal, as well as the contrast between them (Baker 2003; see also Panagiotidis 2015: Ch. 2), and assume this position without discussion. Moreover, we take up the analysis of lexical categories in Panagiotidis (2011, 2015), where it is argued that categorial features encode “fundamental interpretive perspectives” and where two categorial features are posited, after Baker (2003):

- (1) Categorial features:
  - a. An [N] feature, which encodes a sortal interpretive perspective on the concept; hence nouns are kinds.<sup>1</sup>

<sup>1</sup> Alternatively, nouns lack temporal parts (Acquaviva 2014b) as a result of bearing an [N] feature.

- b. A [V] feature, which encodes an extending-into-time interpretive perspective; hence verbs are sub-events.<sup>2</sup>

The notion of fundamental interpretive perspective is introduced in Panagiotidis (2011, 2015) in order to distinguish between conceptual categorisation and linguistic categorisation; the two interact but hardly coincide. To wit, although all physical objects are nouns cross-linguistically, not all nouns denote physical objects (D. Pesetsky, p.c.). Following Panagiotidis (2015: 83–83) we depart from Baker (2003: 296–7) to argue that category distinctions such as the noun-verb one must correspond to perspectives on the concepts about the world, which roots and associated material are employed in order to express. Lexical category distinctions are certainly not ontological distinctions, whether clear-cut or fuzzy. Hence, two nouns like *rock* and *theory* cannot belong together in any useful, or even coherent, conceptual category; however, the concepts encoded by the nouns *rock* and *theory* can be viewed by the Language Faculty in the same way, and these nouns belong together, as far as linguistic categorisation is concerned, in the category ‘noun’. This would suggest that lexical categories, such as noun and verb, are actually particular interpretive perspectives on concepts and that there is a way in which *rock* and *theory* are treated the same by grammar, even if they share no significant common properties notionally.

Understanding lexical categorisation as nouns and verbs introducing different interpretive perspectives reconfirms the insight found in Langacker (1987b), Uriagereka (1999), and Baker (2003: 293–4) that lexical categories introduce different viewpoints on a particular concept. To wit, *sleep* as a noun is treated differently, “is conceptualised” differently according to Langacker (1987b), than *sleep* as a verb: in the first case as a “quasi-object”, in the second as something that may extend into time. This approach also closely interacts with Acquaviva (2009; 2014a). In other words, replying to the question “what conceptual mechanism decides which category concepts are assigned?”, the interpretive perspective approach answers that “grammar does the categorisation”. For instance, grammar makes *sleep* the noun and *sleep* the verb, built from the root and associated with the same concept but encoding different interpretive perspectives (Panagiotidis 2015: 84).

Given the above considerations, it is necessary to distinguish between *denotation* and *interpretive perspective* along the methodological and con-

<sup>2</sup> Alternatively, the [V] feature encodes abstract causation (Ilkhanipour 2013; cf. Darteni 2017: Ch. 7).

ceptual lines of [Acquaviva \(2014b\)](#). For instance, the noun *hour* denotes a temporal interval but its interpretive perspective as a noun is sortal, to be described below. The sortal interpretive perspective a feature [N] imposes on the concept of HOUR, as in (1), renders the noun *hour* a kind and – ultimately – an abstract object of sorts.

Before moving on, and as our claim will be that adjectives as a category lack a fundamental interpretive perspective, let us briefly expand on the two interpretive perspectives for nouns (sortality) and verbs (extending-into-time) proposed in (1).

Sortality was introduced in the linguistic literature by [Larson & Segal \(1995\)](#), echoing the discussion in [Geach \(1962\)](#), and as the interpretation of the [N] feature by [Baker \(2003: 290\)](#). Baker treats a sortal concept as one that canonically complies with the principle of identity: a sortal concept is such that it can be said about it that it is the same as or different from *x*. [Panagiotidis \(2015: 84–86\)](#) closely follows [Prasada \(2008\)](#) and [Acquaviva \(2014b\)](#) to refine sortality as a criterion of application taken together with a criterion of identity (and, in the case of count nouns, individuation). The criterion of application amounts to saying that *x* applies to things of a certain kind, but not others; the criterion of identity defines something which may replace *A* in the statement *x is the same A as y*. Expanding on this summary, we follow [Panagiotidis \(2015: 84–86\)](#) in his interpretation of the three criteria sortality incorporates: *application*, *identity* and *individuation*.

The criterion of application “means that the representation is understood to apply to things of a certain kind, but not others. Thus, the sortal *dog* allows us to think about dogs, but not tables, trees, wood or any other kind of thing” ([Prasada 2008: 6](#)). In this respect, the criterion of application differentiates (sortal, but not exclusively) predicates from indexicals like *this*, *here*, *now*, etc. The criterion of application also underlies the received understanding of bare nominal expressions as kinds in [Chierchia \(1998\)](#), as it “provides the basis for thoughts like “dogs’, [which] by virtue of being dogs, remain dogs throughout their existence” ([Prasada 2008: 7](#)), for as long as external conditions permit them to maintain their existence (for a short time, like *puppy*, or for a long one, like *water* and *universe*).

Very interestingly, this is precisely the meeting point with the intuitions about nominality in prototype theory and in functionalist literature ([Givón 1984: Ch. 3](#), [Croft 1991](#), after [Ross 1973](#)). As far as the “time stability” of nouns in such approaches is concerned, it however turns out that concepts denoted by nouns are not themselves necessarily time-stable – as cogently pointed out in [Baker \(2003: 292–4\)](#). Nevertheless, nouns are

viewed by the Language Faculty as time-stable, irrespective of the actual time stability of the concepts encoded: notice once more the differentiation between denotation and interpretive perspective.

Regarding the criterion of identity, we adopt its reinterpretation in Acquaviva (2009), again echoing Panagiotidis (2015: 85–6). Acquaviva (2009: 4) advances the following argument: if we consider a kind (e.g. the kind *person*) it has instances (i.e., persons) which are particulars and which do not themselves have instances. In this way, being a person is different from being tall: only the property PERSON identifies a type of entity. At the same time, the property of being tall is characteristic of all the entities it is true of, but it does not define a category of being. This interpretation of the criterion of identity underlies the short definition of a sortal concept given above, as such that it can be said about it that it is *the same as or different from X*.

Concluding this short presentation of sortality, the criteria of application and identity taken *together* adequately characterise the interpretive perspective that [N] features impose on the concept they associate with, an association which is syntactically derived. The [N] feature enables a concept – say, *rock* or *sleep* – to act as a condition of identity.<sup>3</sup>

Turning to the interpretive perspective encoded by [V], this can be informally termed as ‘extending into time’, following Uriagereka (1999) and Ramchand (2008: 38–42), who notes: “both nouns and verbs correspond to mathematical spaces of various dimensions, the difference between them being whether those spaces are *seen as permanent or mutable*”.

This interpretive perspective echoes intuitions framed within prototype theory and incorporated in the functionalist literature on word classes (Panagiotidis 2015: 86–7). In work by Givón (1984: Ch. 3), who conceives categories as prototypes along a continuum of temporal stability after Ross (1973), verbs are placed at the least time-stable end of the spectrum, in juxtaposition to nouns. The intuition that the temporal perspective is fundamental for the interpretation of verbs is also reflected in the Ramchand quote in the previous paragraph, as well as in Uriagereka (1999), who understands nouns and verbs as corresponding to mathematical spaces of various dimensions, with the difference between them lying on whether those spaces are respectively seen as permanent or mutable.

<sup>3</sup> As Panagiotidis (2015: 86) argues, the criterion of individuation, i.e. “two instances of a kind are distinct because they are the kinds of things they are” (Prasada 2008: 8), does not apply to mass nouns but it plays a significant role both in the object bias underlying the acquisition of nouns (Bloom 2000: Ch. 4) and in the perceived prototypically nominal character of objects over substances.

Uriagereka's approach incorporates three crucial ingredients: first, the temporal dimension argued for by functionalists as a crucial factor in the distinction between nouns and verbs. Second, Uriagereka also upholds and expands Langacker's (1987a) introduction of spaces in our understanding of lexical categories, who defines nouns as uninterrupted "region[s] in some domain" (Langacker 1987a: 189) and verbs as processes. Third, as seen mentioned above, Uriagereka conceives lexical categories as being different perspectives on concepts, as different "grammaticalisations" of concepts, to recall Anderson (1997). Zooming in on verbs, Uriagereka bases his treatment on the more or less received lore that "themes are standardly nouns" and that "verbal elements [are] functions over nouns". He brings these two statements together by claiming that a verb expresses the derivative of its theme's space over time.

Consequently, temporality, as opposed to Baker's (2003) predicativity, is the relevant ingredient for the perspective setting done on behalf of [V], i.e. of what [V] encodes: the "extending-into-time" perspective makes a verb. Acquaviva (2009: 2) concurs with this: "verbal structure [...] has a temporal dimension built in. Nominal meaning, by contrast, does not have a temporal dimension built in." If we replace "meaning" with "perspective" in Acquaviva's quote, we can make the claim that [V] encodes an actual perspective over the concept with which it is associated and that this perspective is of the said concept as extending into time.

If the above is correct then, verbs and their projections are the basic ingredients of grammatical structures referring to events, although they most likely do not refer to events by themselves. Verb phrases by themselves, let alone verbs, are not events: events are typically constructed (or represented, depending on one's views on such matters) by Voice Phrases (Kratzer 1996, Arad 2005: Ch. 3, Harley 2013). From this point of view, we can actually call Vs and VPs subevents, with the feature [V] contributing the "extending into time" interpretive perspective to the configurational building of an event: hence verbs are inherently (sub-)eventive due to the temporal perspective contributed by the categorial feature [V]. The exact makeup of verbal projections is beyond the scope of this paper, however evidence from Hebrew, Russian and Greek reported in Arad (2005: Ch. 3) seems to suggest that minimal verbs are VoiceP projections, not just vPs – without even addressing the Hale & Keyser (1993; 2002) and Pytkänen (2008) conception of argument structure as syntactic structure.

These different interpretive perspectives of [N] and [V] define the nominal and verbal functional superstructures accordingly. Sortality on [N] will have the associated predicate configurationally related to individuation,



number, quantification etc., which are typically realised as functional categories such as Number, Determiner etc. Correspondingly, the “extending into time” perspective on [V] will introduce abstract temporality as the seed of events and causation, which will configurationally require event participants, a way to encode length of event and/or the relation between time intervals etc., which are typically realised as argument projections, Voice, Aspect, Tense and so on.

So, not only denotation and interpretive perspective (i.e. nominality and verblity) are distinct, but also all three lexical categories are understood to be predicates, as is the received approach. Furthermore, as we will see below, being a property (i.e. a one-place predicate) cannot be the defining characteristic of any lexical category, given that one-place predicates can emerge as nouns (*hue*), verbs (*exist*), or adjectives (*red*), the same way that relational nouns like *mother* or *edge* (two-place predicates) are not verbs, and so on.

Turning to the categorial features themselves, we follow Panagiotidis (2011; 2015) in taking [N] and [V] to be features on the categorizing heads *n* and *v* respectively (Marantz 1997; 2000; 2006). This evidently leaves adjectives out of the picture and this paper will address the questions that consequently arise:

- (2) Does a categorial [A] feature exist? If [A] exists, what interpretive perspective does it encode?
- (3) Does an adjectiviser head *a* exist?

Marantz (1997; 2000; 2006) argues exactly for the existence of an adjectiviser *a*, the third member of a triplet consisting of a nominaliser *n*, a verbaliser *v*, and an adjectiviser *a*. Marantz claims that *a* introduces “properties” – which is a widespread view, albeit usually a tacitly held one. However, intuitively and rather informally, the claim that adjectives encode a “property” interpretive perspective is problematic: as mentioned, just like nouns like *misery* or *hue* seem to denote properties, so do (some) verbs, such as *exist* (Fábregas & Marín 2017: 3–6; Mitrović & Panagiotidis 2018: 2–3).

Moreover, it has been repeatedly observed that adjectives do not seem to possess a uniform interpretive perspective (cf. Fábregas & Marín 2017: 3). True, most predicative adjectives, such as intersective *green* and subsective *big*, could be understood as properties by virtue of their being one-place predicates. However, once intensional adjectives like *future*, *alleged*, *edible*, etc. are factored in, a straightforward understanding of all

adjectives as properties is no longer possible, as intensional adjectives are not one-place predicates but they involve circumstances, i.e. times (e.g. *former*) and/or possible worlds (e.g. *alleged*). Of course, one can still weave an account that acrobatically casts *edible* not as a modal element but as “something that has the property of being possible to eat” (cf. [Francez & Koontz-Garboden 2015-07-01](#)), hence a property, but this would be most probably undesirable from a semantic viewpoint.

A still wider issue exists, however. On closer inspection, it turns out that the widespread take on adjectivity as “property” is too weak and intractable in comparison to the interpretive perspectives of nouns and verbs: sortality and extending-in-time respectively. While it seems necessarily true that “[p]roperties are the semantic counterparts of natural language predicative expressions” ([Chierchia & Turner 1988](#): 261), predicativity alone is an insufficient semantic characterisation of adjectival meanings (i.e., those properties of meaning associated with the adjectival category alone) since both verbs and nouns can associate with predicative expressions. As properties have to be conceived as unary predicates ([Chierchia & Turner 1988](#), cf. [Feferman 2015](#)), their extensions are sets. Type-theoretically, therefore, nouns, verbs, and adjectives denoting properties are all, in a general set-theoretic sense, equivalent, which leads to a weak semantic characterisation of categorial meaning in general and of a purported adjectival interpretive perspective more specifically. Put simply, some adjectives can be properties, just like some nouns and some verbs.

Independently from the denotational dimension and already at a pre-theoretical level, adjectives are also special in that they seem not to belong in the same ilk as nouns and verbs ([Baker 2003](#): Ch. 4), not to “play by the same rules” as nouns and verbs.<sup>4</sup> Some informal facts that have been floated before (e.g. in [Panagiotidis 2016-05](#), but see also a more systematic list in the extended citation from [Fábregas & Marín](#) below) are the following:

- unlike nouns, adjectives are never independent, as they are invariably relational, like verbs ([Larson 1999](#), [Creissels 2006](#): 199, [Creissels 2014](#), [Larson 2014](#): Ch. 7, [Struckmeier & Kremers 2014](#)) – a sometimes overlooked fact;
- unlike verbs, no “light adjective constructions” exist, either of the Japanese Light Verb Construction or of the Farsi Complex Predicate sort;

<sup>4</sup> Echoing here an anonymous Glossa reviewer.



- unlike verbs, there exist no periphrastic adjectives of the *take a shower* or *make good* kind;
- unlike verbs, there exist no particle adjectives as exemplified by minimal pairs like *cook* vs. *cook up*;
- unlike both verbs and nouns, no semilexical/grammatical adjectives exist, with possible exceptions such as the German *solch*.<sup>5</sup>

In addition to the above, we once more stress that there is no unitary characterisation of adjectives in terms of an interpretive perspective and that no such perspective seems possible for adjectives. Even if we ignore the predicative-intensional difference mentioned above, it is well known that many adjectives may oscillate between ‘relational properties’ and standing in the place of genitives (Nikolaeva & Spencer 2010; Fradin 2017; int. al.): consider the ambiguous adjective *papal*, which is ambiguous between “a property characteristic of a pope” and “belonging to a pope” (Arsenijević et al. 2010). This ambiguity is made prominent in Slavic languages, especially Sorbian (Corbett 1987), a language famously possessing transparent cases of ‘possessive adjectives’. Even in Russian, an expression like “Ljuba’s book” can be rendered as *kniga Ljubij*, with a genitive, or *ljubina kniga*, with an adjective.

This state of affairs is near ideally summarised in Fábregas & Marín (2017: 3), who observe (our emphasis):

It seems extremely difficult to identify *positive properties that characterise the category called “adjective”, even in one single language*. Consider, for instance, Bhat’s (1994) wide-ranging typological study. Bhat identified a number of negative properties in adjectives (properties that they lack with respect to nouns or verbs): Inability to identify participants (Bhat 1994: 18; see also Wierzbicka 1980), inability to denote events (Bhat 1994: 19), vagueness (Bhat 1994: 28; see also Kamp 1975), inability to behave as predicates by themselves (Bhat 1994: 48), inability to denote changes across time (Bhat 1994: 63), etc.

We are therefore led to conclude that we cannot motivate the existence of an [A] feature as a lexical-categorial primitive, i.e. as a categorial feature encoding an interpretive perspective, the way that [N] and [V] have been motivated. Consequently, if the interpretive motivation cannot obtain, there is hardly any reason, apart from notational and methodological

<sup>5</sup> On grammatical/semilexical nouns and verbs, see Emonds (1985: Ch. 4), van Riemsdijk (1998), Haider (2001), Schütze (2001), and Panagiotidis (2003).

convenience, to posit a categorial [A] feature and the existence of the adjectival category as a primitive in narrow syntax or beyond.

## 2 On the bicategoriality of adjectives

### 2.1 *Why there are no adjectivisers*

Let us assume we have addressed the question in (2) in a sufficient way: [A] features do not exist or, more accurately, if they exist they do not encode a “property” interpretive perspective, no less because there is no such thing as a “property” perspective on a par with sortality and “extending-into-time”. True, it could be the case that [A] indeed exists and that it encodes a still elusive interpretive perspective, but this seems to be very unlikely.

We now turn to the question in (3): do adjectiviser heads,  $\alpha$ , exist? Is  $\alpha$  a categoriser on a par with  $n$  and  $v$ ? Notice that even if [A] does not exist, the inexistence of adjectivisers is not necessarily entailed. To wit, what could be considered the received scenario in much generative work is that the answer to question in (2) is negative: no [A] feature exists. At the same time, in the very same “received” scenario the answer to (3) could very well be affirmative: adjectivisers could exist even in the absence of an “adjectival” categorial feature.

This scenario on the categorial identity of adjectives goes like this: adjectives are the marked member of the N, V, A categorial triplet. They are understood to be a [N, V] lexical category, one in which both nominal and verbal properties are combined as a result of adjectives bearing both categorial features (Chomsky 1970; Jackendoff 1977; Stowell 1981).

- (4) The adjectiviser head  $\alpha$  may exist even in the absence of an [A] feature, bearing both an [N] and a [V] feature.

We will return to this approach below after we briefly review an account according to which the inexistence of [A] has profound repercussions.

Baker (2003: Ch. 4) argues that adjectives are the “elsewhere” member of the categorial triplet, the unmarked lexical category, lacking any categorial features. He describes adjectives as “a kind of default category, a category with no positive defining essence” (Baker 2003: 270). The reason he opts for this is mainly theory-internal: according to his Reference-Predication Constraint (Baker 2003: 165–169) a syntactic node cannot bear both categorial features, i.e. both an [N] and a [V] feature, because such a beast would induce a sort of interpretive clash. Although Baker does not

opt for categorial decomposition, at least not fully,<sup>6</sup> his account forces us to abandon both an adjectival feature [A] *and* the prospect that adjectivisers exist. Adjectives would be co-extensional to uncategorised roots or they would be roots categorised by some sort of default process (this is unclear in Baker's discussion).

Adjectives conceived as a category lacking specific properties, as the unmarked member of the triplet, runs against typological evidence. To begin with, Dixon (2004: 9–12) points out that adjectives are actually the typologically *marked* lexical category: they typically comprise fewer members than both noun and verb classes and “a higher proportion of adjectives than of nouns and verbs will be derived forms”. Having said that, even the existence of derived adjectives, e.g. denominal and deverbal adjectives, immediately invalidates the option of the adjective category resulting from the absence of categorial features: if adjectives are categorially unmarked, what kind of features would adjectivising affixes bear?

Even though Baker's account of adjectives as the unmarked category runs into serious problems, the received [N, V] scenario on their categorial identity is not without problems either. This scenario was conceived as a neat solution towards cross-classifying lexical categories but the [N, V] specification for adjectives has only been incompletely justified in empirical terms, e.g. by Stowell (1981). Furthermore, the [N, V] account presents us with two problems, a formal-interpretive one and a typological one.

The formal-interpretive problem is this: what kind of interpretation at the Conceptual-Intentional interface would such a dual feature specification encode? Do we wish to say that adjectives are invariably both nominal and verbal, i.e. encoding both a sortal and an extending-into-time interpretive perspective? Even a casual look at simplex adjectives like *red* or at derived ones like *papal* indicates this would be untenable. To be more explicit on the conceptual difficulties of an adjectiviser *a* as a single head encoding both [N] and [V], this coexistence would be problematic on at least two counts:

- (5) a. The sortal perspective of [N] and that of extending-into-time of [V] would contradict each other; even if they do not con-

<sup>6</sup> The statement is qualified because Baker (2003: 79–83) proposes that we syntactically decompose verbs into a V head and an adjective (which according to him is essentially a category-less root).

tradict each other, they would yield an unattested composite interpretive perspective for adjectives;<sup>7</sup>

- b. The [N, V] coexistence on a single node in all probability cannot yield a single categorial label and/or would induce a type-theoretic clash (Mitrović 2018).

The second problem of the [N, V] specification for adjectives is that typologically speaking, the broad generalisation is that some languages have verb-like adjectives (e.g. Korean – see Haspelmath 2001: 16542; Kim 2002), some noun-like adjectives (e.g. Indo-European), some both verb-like and noun-like (e.g. Japanese – see Miyagawa 1987; Iwasaki 1999: Ch. 4) and in some languages adjectives apparently look like neither (see Stassen 2013). Crucially, adjectives are neither “half nominal and half verbal” in all languages nor “fully nominal and fully verbal”, which are possible states of affairs that a dual [N, V] head would induce; see also the discussion in the last section of this paper.

The noun-like character of adjectives in some languages, including those in Indo-European and Semitic, is evident in their morphological similarities with nouns, with which they share inflectional morphology and/or the kind of features they encode: gender, number and, in some languages, case. It is because of the close morphological similarities between nouns and adjectives in Greek and Romance (beginning with Latin) that Western descriptive grammarians only relatively recently distinguished “names” (*onómata*, *nomina*) into (substantive) nouns and adjectives.

At the same time, in languages like Korean adjectives behave like a subclass of the verb category. Citing Haspelmath 2001: 16542, “in Korean, property concepts inflect for tense and mood like verbs in predication structures, and they require a relative suffix [...] when they modify a noun, again like verbs”.

<sup>7</sup> An anonymous reviewer makes an incisive question: “why exactly [would] a sortal and an event perspective be untenable for simplex adjectives like *red* or *papal* [?]” First, empirically speaking, *red* or *papal* clearly do not involve events, let alone individuated events or such. Second, and more interestingly, when natural language grammar is coerced to describe individuation and/or counting of events, it invariably nominalises the events first, either as deverbal nouns (lexical nominalisations) or as mixed projections (Harley & Noyer 1998; Pires 2006; Moulton 2004): it appears that sortality and an extending-into-time perspective can combine only configurationally. Finally, let us just clarify that here we follow Panagiotidis (2011; 2015: Ch. 6) in distinguishing between simple lexical nominalisations, which involve purely lexical structures (pace Alexiadou 2001; Alexiadou & Schäfer 2010; Alexiadou et al. 2011), and mixed projections like gerunds, which consist of a verbal or clausal functional spine embedded inside a nominal functional shell (Wiltschko 2014: 76–7; Panagiotidis 2015: Ch. 6).

- (6) Korean adjectives
- a. salam-i      mek-ess-ta  
     person-NOM eat-PAST-DECL  
     ‘The person ate.’
  - b. san-i      noph-ess-ta  
     hill-NOM high-PAST-DECL  
     ‘The hill was high.’
  - c. mek-un salam  
     eat-REL person  
     ‘A person who ate.’
  - d. noph-un san  
     high-REL hill  
     ‘A high hill.’

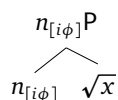
Therefore, from a typological viewpoint adjectives are categorially ambivalent not “half-and-half”. How can we derive this varied picture if two categorial features are encoded together either on the adjective itself or on the adjectiviser *a*? More specifically, if adjectivisers (a heads) universally bore both [N] and [V], then it would be expected that adjectives would uniformly behave as both nouns and verbs cross-linguistically in equal measure, i.e. they would be 50% noun 50% verb or both noun and verb simultaneously – whatever these options would entail. Such a scenario is clearly not the case.

The above considerations lead us to a paradox: adjectivisers cannot exist but adjectives certainly do, in quite a few languages, too. Adjectivisers cannot exist as bearing a distinctive categorial feature [A], because an [A] feature on a heads would encode an elusive and probably inexistent interpretive perspective. Nor can adjectivisers exist as encoding both [N] and [V] for the reasons outlined in (5), clash and unlabellability, and because of the varied typological picture of adjectives: they do not equally combine nominal and verbal characteristics. At the same time a featureless adjectiviser would be impossible – something that our criticism of Baker (2003: Ch. 4) makes all too clear. Hence, answering the question in (3), adjectivisers (the purported *a* heads) do not exist and there is no other categorising head besides *n* and *v*. Therefore, the above amount to an admission that there exist only two lexical heads, the nominaliser *n* and the verbaliser *v*.

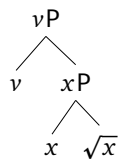
## 2.2 Adjectives as categorial composites

In this paper we embrace the above admission and we go on to subscribe to a general view in which a categorial “biverse” is assumed, i.e. a universal doubleton inventory of categorisers containing nominalisers ( $n$ ) and verbalisers ( $v$ ) alone. Consequently, we contend that the adjective category derives as categorially composite. However, and as justified above, we go beyond the claim in (4) that  $a$  encodes both [N] and [V], and we argue that adjectives are not just *featurally* but *structurally* composite:

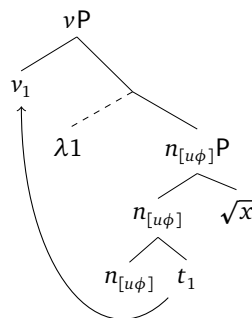
- (7) Adjectives result from categorisation by both a nominaliser  $n$  and a verbaliser  $v$ .
- (8) *Three categories, two categorisers, two categorial features*
  - a. Nouns



- b. Verbs<sup>8</sup>



- c. Adjectives



<sup>8</sup> The  $x$  node in (8b) is of course distinct from the  $\sqrt{x}$  root and stands for any low applicative (Pylkkänen 2008) or similar “inner morphology” (Marantz 2000; 2006) elements.

The structure for adjectives proposed in (8) illustrates the thesis in (7): when a root (or an already categorised structure, in cases of recategorisation) is categorised by  $n$  and  $v$  in tandem, then an adjective is derived. In other words, we argue that *a projectionally non-extended set of  $n$  and  $v$  derives the adjectival ‘category’*. The difference from received accounts of adjectivity is crucially that these posit an adjectiviser that would host both categorial features, [N] and [V], while our claim is that these features are each hosted by their own categoriser,  $n$  and  $v$  respectively, which in turn stand in a structural configuration to be elaborated upon. This claim is motivated on both theoretical and empirical grounds, the latter of a typological sort, as will be discussed throughout this paper.

Regarding the excorporation of the one of the categorisers in (8c), the verbaliser in this case, we believe it is necessary in the spirit of (5) above and of the surrounding discussion. Recall that in (5) we present pointers on why adjectivisers cannot be *featurally* composite, on why [N] and [V] cannot coexist on a single head, namely unlabelability, an unattested interpretive perspective and an expectation of a 50-50 nominal-verbal behaviour for adjectives cross-linguistically.

However, pointer (5a) also applies to our account, one in which adjectives (not adjectivisers any more) are structurally composite as the result of directly merging a root with the  $n$ - $v$  composite: the [N] and [V] categorial features would clash and contradict each other and the head complex of  $n$  and  $v$  would lead to type mismatch certainly after it enters the derivation, and most likely at the point of Spell-Out. At this point we think that labelability considerations and type mismatch sufficiently motivate a symmetry-breaking operation, viz. the excorporation of one of the minimal categories: in (8) we take  $v$  to undergo such movement, although the reverse scenario will also be discussed later.

In our account excorporation both is possible (as each feature is situated in different terminal nodes) and appears to be a matter of conceptual necessity. For the purposes of this paper, we execute it as an instance of attraction by a lambda operator represented in narrow syntax, a  $\lambda$  head à la Shimada (2007), who argues for the existence of  $\lambda$ -slots in syntax. We should however hedge here on two counts: first, the purported categorial clash could also possibly be resolved via type shifting instead of excorporation, and the structural mechanism that may license or trigger type shifting would be worth exploring.<sup>9</sup> Second, we more or less understand that  $\lambda$  node in a Kaynian spirit, as a head that provides both (i) a structural mo-

<sup>9</sup> We are grateful to a reviewer for this point.



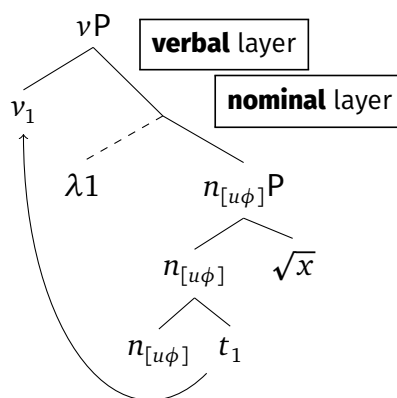
tivation for breaking the fearful symmetry and (ii) a structural position for the exorporating categoriser to move to. We therefore do not import Shimada's theory wholesale, and alternatives to  $\lambda$  such as inner morphemes (Marantz 2000; 2006) are also notational options worth exploring in further research.

### 2.3 The derivation of adjectives

We are now ready to spell out the analysis according to which the adjectival category arises without an adjectiviser and as a derivational consequence of the nominal-verbal complex, bearing both [N] and [V] features. Our analysis overcomes the technical and conceptual shortcomings of Chomsky (1970), where features [N] and [V] coexist on a single adjectival head; it also partly eschews the ad hoc character of Baker's (2003: 165–169) Reference–Predication Constraint, which simply posits that semantically [N] and [V] clash with each other. The above are achieved by arguing that unlabelability due to the co-existence of [N] and [V] on a single composite  $n$ - $v$  head within a single phase must be resolved by breaking the said symmetry and by promoting one of the two categorisers to the phase edge.

So, let us follow step by step the derivation of a root-derived Indo-European adjective – which will be extended and revised to cover other typological options later.

#### (9) Deriving an Indo-European adjective



Thus, an adjective is derivationally born in the following way, as: the root ( $\sqrt{x}$ ) and a composite head comprising both the  $n$  and the  $v$  categoriser, qua bearers of the [N] and [V] features respectively, enter the derivation together. The  $n$ - $v$  composite head and  $\sqrt{x}$  merge to form a syntactic object (SO), here we assume that Merge applies freely and that it is distinct from labelling (see below). The SO that results from this application of Merge comprises a categorial clash due to the [N] and the [V] feature and is therefore unlabellable (cf. Chomsky 2013 on labelling; Panagiotidis 2015: 130–133 on categorial features in labelling); this temporarily halts the derivation. The composite head would also suffer type mismatch, perhaps as a result of unlabellability. A lambda operator, which we represent in narrow syntax, is then merged. The  $\lambda$  triggers the symmetry-breaking excorporation of  $v$ , which moves to the root of the  $\lambda$  projection and projects.<sup>10</sup>

In order to make our argument clearer, let us lay out some definitions and assumptions explicitly.

First we begin by assuming that  $X$  is a syntactic object if  $X$  is a set of syntactic objects (Collins & Stabler 2016: 68, def. 35); additionally, a distinct determinate labelling function exists, one that takes a labelling set (the set of all possible labels for a SO, containing the labels of the SO's daughters) and returns the unique label for a SO, if one exists, otherwise it returns the labelling set itself (in line with Chomsky 2013).

Second, the categorial label of the SO [ $n^0 v^0$ ], corresponding to  $\{n^0, v^0\}$  in Bare Phrase Structure or set-theoretic terms, cannot be uniquely set by a single (categorial) label, of either  $n^0$  or  $v^0$ , due to indeterminacy. Since the label cannot be uniquely determined, for [ $n^0 v^0$ ] the labelling function returns the set itself. However, [ $n^0 v^0$ ] can still enter into a Merge operation and we can assume, standardly, that the selectee of this operation is a root,  $\sqrt{x}$ .

We crucially side with the understanding that roots have no formal, and certainly no categorial, features (Acquaviva 2009; 2014a; Borer 2009–04; 2014; Harley 2014; Panagiotidis 2014). Thus the result of First Merge is the following: [ $n^0 v^0$  [ $n^0 v^0$ ] [ $\sqrt{x}$ ]], with the label still being the  $\{n^0, v^0\}$  set; note that the first-phase categorisation has not yet taken place at this point. To tie these notions underlying the proposed derivation together,

<sup>10</sup> A reviewer appears to make a different suggestion, namely that the symmetry-breaking operation is triggered by the fact that the composite  $n$ - $v$  head consists of two phasal heads, which would possibly entail both spelling out their sister. As clarified in the discussion here, we argue that phasal spell-out actually follows both excorporation and labelling.

we ensure that both the phasal and the uniquely labelled status of a SO, or “adjective proper”, is derived.

Third, we follow [Chomsky \(2013\)](#) in assuming that the labelling operation can be delayed and that labels are determined by the labelling algorithm (LA) at phase level the latest. This leads to the final step in the derivation, namely the excorporation of one of the heads. Note that the non-uniqueness of labels follows from the availability of labelling delay: determining a unique label has been postponed since no suitable label is guaranteed, while Merge may proceed. The resulting object,  $[_{n^0} \nu^0 [_{n^0} \nu^0] [\sqrt{x}]]$  does not constitute a phase given non-uniqueness and contradiction in the labelling set. This conflict yields the final step in the derivation, namely the excorporation of one of the heads.

Finally, we can now take the resulting complex structure in (9), corresponding to an adjective, to be a strong phase: “A syntactic object SO is a strong phase iff SO is a maximal projection with label lexical item ([Collins & Stabler 2016](#): 68, def. 35).

Hence, the resulting SO is type-compatible and labellable, as desired. This bicategorical adjective analysis makes Indo-European adjectives look like verbs on the outside and nouns on the inside. We now proceed to laying out the evidence for this prediction.

### 2.3.1 Nominal interior

From “below”, Indo-European adjectives behave like nominals in that they may show concord, a case of  $\phi$ -agreement, as in Slovenian below, where the adjective gender features are valued by those of the noun.

#### (10) Concord as $\phi$ -agreement (Slovenian)

- a. siv- $\emptyset$  stol- $\emptyset$   
grey-SG.M chair-SG.M  
‘(a) grey chair’
- b. siv-a miz-a  
grey-SG.F chair-SG.F  
‘(a) grey desk’
- c. siv-o pohištvo-o  
grey-SG.N furniture-SG.N  
‘grey furniture’

In our account concord is straightforwardly captured as the result of the presence of a nominaliser. What is involved in deriving an adjective

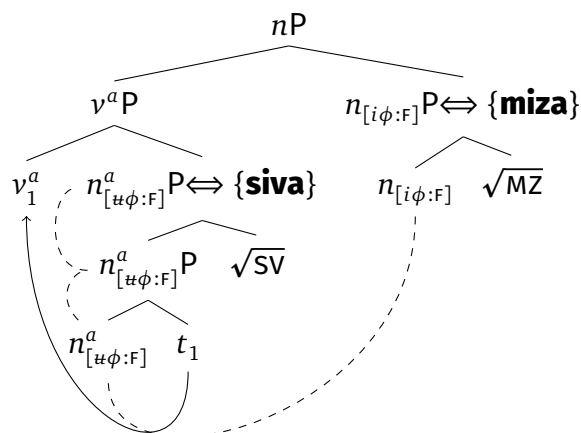
is not just an [N] feature, which would otherwise encode interpretive perspective, on an [N][V] adjectiviser, but an actual nominaliser  $n$ , a head that has other characteristics (qua features) than just categoriality. Now, of course adjectives show concord for number and, in some languages, case, too. However they are the only lexical category that displays gender concord, with gender being an intrinsically nominal feature (Lowenstamm 2008; Ferrari-Bridgers 2008; Kihm (2008); Acquaviva 2009; Kramer 2009-06; Panagiotidis 2018). We therefore have good reasons to believe that, in the case of adjective concord, agreement for gender is different from agreement for number and case: whereas the latter is due to the workings of some functional shell dominating the adjective, adjectival agreement for gender should be captured as a categoriser reflex as in (11) below, resulting from the configurational bicategoriality of adjectives.

In other words, if adjectives were categorised by an [N][V] adjectiviser, concord would have to be explained as some sort of epiphenomenon. If, however, adjectives are categorially composite and their derivation begins with the merging of a composite  $n$ - $v$  head as sketched in (9), then the concord can be triggered by the nominaliser  $n$  that forms part of the composite head. As is going to be expanded and justified below, concord makes sense if the nominaliser forming part of the composite  $n$ - $v$  head deriving adjectives is defective, call it an  $n^a$ . A similar claim for the defective character of the verbaliser  $v^a$  that is part of the  $n$ - $v$  composite head that derives adjectives will be stipulated here and expanded upon later, in the *A metric for categoriser defectivity* section.

A structure of an adjectivally modified noun phrase is given in (11), where we exclude  $\lambda$ -terms for simplicity of exposition. Prior to the ex-corporation of  $v$ , the  $n^a$  is in a c-commanding and Agree-able relation with  $n$  so as to allow  $\phi$ -feature valuation, qua nominal  $\phi$ -concord.

- (11) *Adjectival structures and first-order modification: siva miza 'grey table'*<sup>11</sup>

<sup>11</sup> Roots are given in "Semitic" notation, as MZ for *miza* ('table') and sv for *siva* ('grey'), but no theoretical significance is attached to this. Vocabulary Items, morphological spell-outs, are within curly brackets. Dashed lines indicate the  $\phi$ -agreement relations (cascading, not multiple or simultaneous).



Hence we derive the noun-adjective concord by positing that the nominal component in the adjectival head-complex  $n-v$ , i.e. the nominaliser  $n^a$ , is defective insofar as it lacks valued  $\phi$ -features, present on independent  $n$  heads that feature in “lexical” nouns and nominalisation structures.

As already noted, the well-known affinities of Indo-European adjectives to nouns have led traditional grammarians to hardly distinguish between nouns and adjectives in their part-of-speech taxonomies. This is mainly the result of morphological similarities and the occasional identity between nominalising and adjectivising affixes, something that is also found in e.g. Bantu (Creissels 2014). As De Belder (2011: Ch. 4) discusses, some categorial affixes are *prima facie* homophonous for both nouns and adjectives, e.g. the English affix *-an*, which doubles both as a nominaliser, as in *librari-an*, and as a (seeming) adjectiviser, as in *reptili-an*. In our account one can easily capture this as not an accident but rather as the result of an  $n$  (making nouns like *librarian*) and a defective  $n^a$  (participating in the derivation of adjectives like *reptilian*) being homophonous or, even, being the spell-out of the [N] feature itself. Similar facts, albeit with an interpretive twist, hold for *-ful*: it sometimes yields content nouns meaning “fitting in an X” (e.g. *handful*, *bucketful*, *pocketful*, etc.) and sometimes adjectives meaning “full of X” (*beautiful*, *wonderful*, *hateful*, etc.).

Let us now briefly turn to the fact, pointed out by several audiences and two anonymous reviewers, that adjectivising affixes like English *-able*, *-ic*, *-ous*, etc. are not noun-like, or verb-like for that matter. Of course, adjectivising affixes often encode more than just “adjective’, *-able* is a case in point, as it encodes possibility, i.e. a modal operator. With this in mind,

we can suggest on an informal plane that even forms that purely encode “adjectivity” are exponents of both the  $n$  and the  $v$  involved in the derivation of adjectives. A possible mechanism via which this is achieved would be a version of *spanning*, as described in Merchant (2015).

### 2.3.2 Verbal exterior

As (8) and (9) illustrate, an Indo-European adjective is expected to display quasi-verbal behaviour externally. By hypothesis, we can link the presence of the  $v^a$  verbaliser with the inherently relational character of adjectives. Having said that, the main empirical point compatible with the expectation that Indo-European adjectives externally behave like verbs is the otherwise curious fact that they are modified by adverbial elements, and never by other adjectives.<sup>12</sup>

- (12) *Adjectives are modified by adverbials*
- a. truly / really remarkable (*English*)
  - b. ondos / pragmatika aksiosimioti (*Greek*)  
truly      really      remarkable
  - c. bien / vraiment marquant (*French*)  
truly      really      remarkable

We call this a “curious” fact first of all because, as far as we know, there is no satisfying explanation for it; moreover, if Indo-European adjectives were equally “nominal” and “verbal” (as expected from their received but fallacious “coequal” [N][V] specification), adjectives should in principle be available as modifiers of other adjectives.<sup>13</sup>

We illustrate with Slavic data from Slovenian how our bicategorical structure for adjectives in (9) and (11) can be used to explain the adverbial mod-

<sup>12</sup> A reviewer reasonably wonders why the excorporated  $v^a$  ends up having zero exponence. Keeping in mind interesting counterexamples, such as the “spurious past” suffixes in *brown-eyed* and *moneyed* (Nevins & Myler 2014), at least two options present themselves: It could be the case that the overall relational character of adjectives, as discussed in the last section, makes  $v^a$  sufficiently visible or – as mentioned – that  $v^a$  contributes to the exponence of adjectivising morphology, e.g. *-ic-*, that is not nominal-like via spanning. See also the last section.

<sup>13</sup> Examples such as [*light blue*] shirt, [*deep blue*] sea, [*red hot*] iron and the like stand in contrast with e.g. *predominantly grey table* and *visibly hot iron*. It however appears that terms like *deep blue* are compound-like adjectives and that no true modification by *deep* is involved.

ification facts. In Slovenian, adverbs are neuter and look like morphologically default versions of adjectives.

(13) *Adverbs modifying adjectives (Slovenian)*

- a. pretežn-o/\*-∅      siv-∅      stol-∅  
     predominant.SG.N/M grey-SG.M chair-SG.M  
     ‘(a) mainly grey chair’
- b. pretežn-o/\*-a      siv-a      miz-a  
     predominantly.SG.N/F grey-SG.F table-SG.F  
     ‘(a) mainly grey table’
- c. pretežn-o      siv-o      pohištvo-o  
     predominantly.SG.N grey-SG.N furniture-SG.N  
     ‘mainly grey furniture’

We capture this in terms of the Phase Impenetrability Constraint (Chomsky 2001, et seq.) blocking  $\phi$ -concord of the adverbial element *pretežno* with the gender and the number features on the noun. Concord is blocked in our system by the fact that, ceteris paribus, categorisers are Minimal Phases, as in Chomsky (2001), Marantz (2006), Roberts (2010), Panagiotidis (2011; 2015: 60–72). In Slovenian, as shown in (13), neuter agreement kicks in as a default/unmarked option (see Marušič et al. 2008, int. al.) as last resort rescue at Vocabulary Insertion. In very general terms, our analysis accounts for adverbs as adjectives unable to  $\phi$ -agree by virtue of the Phase Impenetrability Condition, which we find is a desirable consequence.<sup>14</sup>

## 2.4 Bicategoriality and beyond

Summarising the discussion so far, an account arguing that adjectives are structurally composite proposes that they are bicategorial because they are categorised by a composite  $n$ - $v$  head, comprising defective versions of the (only) two categorisers. In other words, adjectives result from simultaneous categorisation by both  $n$  and  $v$ . However, such an analysis raises a number of issues, listed below:

(14) If adjectives are structurally bicategorial, then

<sup>14</sup> Corver (2014) derives adverbs from an A(djective)P moving to Spec,Cop(ula)P. In English this is headed by a Cop head *-ly* in prenominal adverbial structures, hence contrasts like *He swam quick(ly) to the shore* vs. *He quick\*(ly) swam to the shore*. His empirical facts are derivable by virtue of a verbal presence in the proposed adjectival structure (where his Cop head is analogous to our  $v^a$ ).



- a. Why are they not bimorphemic, as would be expected from [ $\nu$  nP] structures?
- b. Why do they not support verbal (or nominal) functional superstructures (aka Extended Projections)?
- c. What kind of interpretation do they receive?
- d. What is the picture beyond Indo-European?

Let us begin with (14a), i.e. the morphological exponence of the complex categorising structure for adjectives. Restricting ourselves to Indo-European for the time being, it appears that “adjectivising” morphology is mainly nominal-looking and monomorphemic, as briefly discussed in the Nominal interior section regarding the ambiguity of suffixes like *-an* (nominal *librarian* vs. adjectival *reptilian*) and *-ful* (nominal *handful* vs. adjectival *wonderful*), with “spurious tense” *-ed* in *brown-eyed* and *mon-eyed* providing interesting exceptions (Nevins & Myler 2014). At the same time, forms like *-ic-* are neither nominal nor verbal. We will address this issue in the next section in more detail, let us however point out here that morphological realisation by hypothesis takes place at phase levels. As a result, we expect morphology to insert Vocabulary Items (or “forms”, in more theory-neutral terms) after  $\nu$ -excorporation has taken place and after the whole structure is established as a (strong) phase and spanning (or similar) has applied on the monophasal structure, see the derivational diagram in (9). Granting this, in the next section we will link the nominal or verbal flavour of adjectivising morphology precisely to whether the  $\nu^a$  verbaliser (as is the case in Indo-European) or the  $n^a$  nominaliser is the categorising head that actually excorporates in adjectival structures.

The second matter raised in (14) is that no verbal functional superstructure (‘Extended Projection’) is allowed on top of the  $\nu^a$  projection dominating the adjectival structure. This is quite striking in a syntactic framework where basic syntactic relations are viewed as resulting from the interaction between syntactic heads, take argument structure for instance (Hale & Keyser 1993; 2002; Ramchand 2008, Pylkkänen 2008).

Even Voice is absent from adjectival functional superstructures, a head that is otherwise a close companion of verbalisers, yielding events (cf. Kratzer 1996) and, possibly, forming minimal verbs (Arad 2005: Ch. 3). The absence of Voice from adjectival projections is evident: accusative Case assignment is not possible by adjectives and they do not support true external arguments. Even if we concede that a purely relational Voice head is there (harking back to Baker 2003: Ch. 4 or Struckmeier & Kremers 2014), like the Voice head Alexiadou (2001) takes to be part of deverbal nomi-

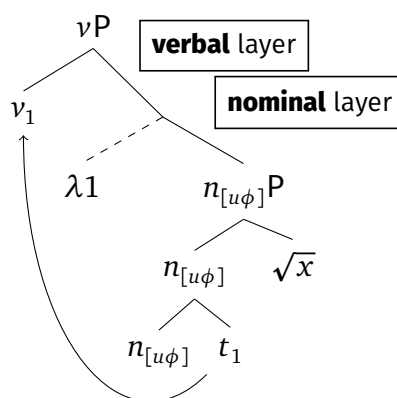
nalisation, no empirical evidence is available for its presence, although adjectives are understood to be inherently relational (Larson 1999, Creissels 2014, Larson 2014: Ch. 7, Struckmeier & Kremers 2014).

Needless to say, similar facts hold for the embedded nominal superstructure: adjectives tolerate no independent Number head and do not directly combine with quantifiers or articles unless nominalised (e.g. *the very rich make up 1% of the population*). If indeed adjectivising is the work of a composite  $n$ - $v$  head, why are functional categories matching the nominaliser and the verbaliser (à la Grimshaw 1991; Ouhalla 1991; van Riemsdijk 1998; Panagiotidis 2015: Ch. 5) not available in adjectival projections?

At least two paths can be followed towards answering this question. A first thread to follow would be invoking the bicategoriality of the initially composite  $n$ - $v$  head, which would lead to indeterminacy regarding the categorial matching (or categorial Agree in Panagiotidis 2015: Ch. 5) of functional heads. However, this symmetric duality is precisely the reason excorporation takes place, recall (9) and the related discussion. A second path to follow would be to argue that even in a non-symmetrical structure like (9), repeated below for convenience, the existence of two categorisers in the structure somehow induces categorial indeterminacy.

(15) Deriving an Indo-European adjective

(repeated)



This line of reasoning does not hold water either: denominal verbs like *fantasise* involve something like a  $[_{vP} v nP]$  structure, but they are perfectly verbal and can support ordinary verbal superstructure, such as Voice, Aspect, Tense and the like. Interestingly, the difference between adjectival

structures and denominal verbs like *fantasise* provides us with a structural minimal pair: although both involve a verbal layer embedding a nominal one, in the case of the verb *fantasise* we have recategorisation through the merger of two independent categorisers, first an *n* with the root (yielding *fantasy*) and then of the resulting *nP* *fantasy* with *v*, yielding *fantasise*. As a result, denominal verb structures like *fantasise* are biphasal (cf. Fu et al. 2001).<sup>15</sup> On the other hand, in the case of an Indo-European adjective, the excorporation of the verbaliser as *v* movement creates the monophasal structure in (15).

Establishing that adjectives are monophasal syntactic structures containing both *n* (therefore an [N] feature) and *v* [therefore a [V] feature], does not explain why they cannot support nominal or verbal functional structure, like Det, Num or Q and Voice, Asp or T respectively. A first way to explain this state of affairs is to attribute the inability of adjectives to support nominal or verbal functional structure to the fact that both [N] and [V] are externally visible, although they are inside a monophasal and properly labelled projection (*vP* in Indo-European, *nP* in Korean etc.). This can be made to derive the impossibility of matching adjectives with functional heads via categorial Agree (Panagiotidis 2015: 124–7).

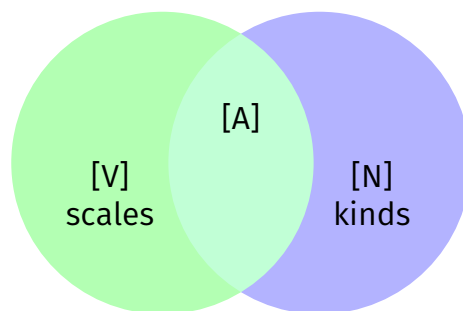
A second path, suggested by an anonymous reviewer, would be to blame the inability of adjectives to support nominal or verbal functional structure on the fact that the participating heads *n<sup>a</sup>* and *v<sup>a</sup>* are defective, defective enough not to support Num or any of the typical functional structure of lexical nouns and defective enough to hardly support any verbal functional structure, not even the verbaliser's close companion, Voice. In the following section we discuss defectivity in more detail. Ideally, monophasality, bicategoriality and categorial defectivity could be synthesised in one coherent explanation, something we will leave for future work.

The third issue in (14) concerns the semantics induced by the *n-v* composite head. The combination of the two heads, hence of the interpretive perspective features [N] and [V] respectively, would according to (1) induce an interpretation combining sortality, courtesy of [N], and temporality of sorts, courtesy of [V]. To wit, in (5) we saw that the sortal perspective of [N] and that of extending-into-time of [V] would probably contradict each other or that they would yield an unattested “combined” interpretive perspective for adjectives. Clarifying, the clashes described in (5), both the categorial and the interpretive one, result from the co-occurrence of two

<sup>15</sup> For these reasons, mixed projections such as gerunds are also irrelevant here, see footnote 7.

categorial features on the same head, not from the co-existence of  $n$  (bearing [N]) and  $v$  (bearing [V]) within the same configuration.

But what if in the adjectival configuration of (15) we did not get the conjunction of these two interpretive perspectives, qua their union, but something like their intersection, as developed in Mitrović (2018) (using a multi-sorted type theory)?



**Figure 1:** Putting [N] and [V] together (à la Mitrović 2018).

Conceptually, one quantises nominal denotata differently from verbal ones: nouns (count or mass) take their meaning in the domain of individuals (type  $e$ ), while verbal expressions (such as an exemplary simplex *fell*, as in *John fell*) denote temporal points or time intervals, with the denotata being of a higher situational type. The type-wise discrepancy between minimal nouns and verbs is reflected in narrow syntax, too, as already alluded in the discussion of (5), in footnote 7 and passim: to bring together the conceptual “bones” out of which nouns and verbs are built, we posit a two-dimensional proto-semantics for categorial meanings, i.e. we assume there are two core denotational domains: a scalar one (for verbs) and a sortal one (for nouns). Nouns take their denotata from the  $e$ -type set of individuals, while verbs derive their meanings from a scalar domain of time-points. As mentioned already twice, derivationally verbs by themselves do not denote events, which are placed in time along the scalar dimension, but rather build expressions (such as VoicePs) that do.

The idea that the core building block of (first-phase) verbal meanings is a scalar domain (Mitrović 2018), we are in a position to extend and exploit this interpretational theory in our analysis of the categorial makeup of adjectives. The bicategorial analysis we advocate predicts that by virtue of their bicategorial status, adjectives should share some primitive semantic aspects with both nouns and verbs. Logically, we assume adjectival meanings arise as a result of set-intersection between the two (sortal and scalar) domains (SORT and SCAL, resp.).

(16) The semantic/logical reflex of categorisation is domain-restrictions.

- (17) a.  $\llbracket n \rrbracket = \{x \mid x \in \text{SORT}\}$   
 b.  $\llbracket v \rrbracket = \{y \mid y \in \text{SCAL}\}$   
 c.  $\llbracket \text{'adjectiviser'} \rrbracket = n \circ v$   
 $\quad = \{z \mid z \in \{\text{SORT} \cap \text{SCAL}\}\}$

In (17c) it is stated that category-theoretic homomorphism is expected whichever categoriser excorporates. This equality of  $\llbracket n \rrbracket \circ \llbracket v \rrbracket$  and  $\llbracket v \rrbracket \circ \llbracket n \rrbracket$  (up to a point) is a desirable consequence of our analysis, since we are not predicting (core) interpretational differences in the meaning of adjectives depending on which categoriser excorporates (more on this in the following section).

Thus the theory of first-phase syntax/semantics can be recast as stemming from an empirically testable and verifiable principle. It is important to stress that the scalar interpretation of adjectives is not an interpretive perspective per se but a sort of default interpretation arising from the ontological primitives of our theory. In this respect and in this respect only Baker (2003: Ch. 4) is correct in viewing adjectives as “a kind of default category, a category with no positive defining essence” (Baker 2003: 270). So, recalling Dixon’s (2004: 9–12) points, although adjectives are morphologically marked, also comprising word classes smaller than those of nouns and verbs, and although by hypothesis they are categorised via a mechanism more complex than the one involved in making nouns and verbs, adjectives nevertheless are not characterised by an (inherent) interpretive perspective.

Having said that, and if [N] and [V] can have their semantic interpretations interlaced after all, why insist on combining them structurally, i.e. on separate heads  $n$  and  $v$ , and not revert to an adjectiviser which would host both features? This objection has been answered in the discussion of (5), along the lines of labelling and types. We also hinted that typologically speaking the presence of two equipotent features on the same head would suggest that typologically all adjectives are nominal and verbal in equal parts, which is clearly the wrong prediction.

In the next section we provide further support for the proposed bicategorical derivation for adjectives by drawing on empirical evidence of wider typological variety and going beyond Indo-European. The typological distribution of adjectives, with regard to their categorial encoding, will provide independent evidence for the categorially composite view of adjectives as involving two categorisers, addressing the fourth point in (14). At the same time, the typological feature will feed back into our account,

explaining why the categorisers involved in adjectivisation, our informally termed  $n^a$  and  $v^a$ , are special.

### 3 **Categorial defectivity: excorporation, and typology**

Positing that adjectives result from a composite  $n$ - $v$  head categorising a structure or a root has a serious advantage over claiming that an [N][V] adjectiviser exists: we can now account for their dual character in Indo-European (nominal interior, verbal exterior) but we do not run into problems either regarding labelling or even the fact that adjectives are categorially ambivalent typologically but not Janus-like (i.e. they are not nominal and verbal “in equal measures”).

Moving beyond Indo-European adjectives we have to look into the typological picture and see how it can be captured in our structurally bi-categorial model, while enabling us to make more precise predictions regarding the claims of our account.

#### 3.1 ***Which categoriser excorporates: a case of look-ahead?***

We followed traditional lore, going back to Greek and Latin grammarians of late Antiquity, in presenting adjectives as internally nominal; we also argued that they are externally verbal by virtue of their being modifiable by adverbs. This seems to be the situation in Indo-European languages. It is however a well-known fact that not all languages go that way. It is an established typological generalisation that there appears to exist a four-way system of categorial encoding of adjectives across languages (Beck 1999; Dixon 2004; Stassen 2013). In (18) below the summary of the WALS data by Stassen (2013) is presented ( $N = 386$ ).

- (18) Cross-linguistically, adjectives may behave like
- a. “non-verbs” (34%)
  - b. verbs (39%)
  - c. mixed, i.e. a) as neither verbal or nominal or b) as either verbs or nouns (27%)

Let us first clarify, as already mentioned, that this kind of variation cannot be captured if featurally composite adjectivisers, i.e. bearing both [N]

and [V], exist. If  $\alpha$  heads were responsible for making adjectives in natural language, then no such variation would be possible: adjectives would either be 50-50 nominal and verbal or simultaneously both nominal and verbal. Stowell (1981) was the first to recognise this problem and claims that adjectives in languages like Chinese are maybe underspecified as [+V] – essentially making them verbs (for discussion see Hu 2018 and those he cites), or perhaps participles, as verbs in other languages would still have to be [+V –N] in Stowell's system. However, if we commit ourselves to lexical categories being about interpretation and not mere taxonomic pigeonholes, then this kind of reasoning cannot go a long way.

What we do here is exploit the possibilities given by the mechanics of our syntactic categorisation account in order to capture typological variation and the different kinds of categorial encoding of adjectives across the world's languages. We derive the typological partition in (18) thus: we propose that the relevant parameter pertains to the object of excorporation from within the, arguably universally available, adjectival  $n-v$  head-complex.

Hence, Indo-European-type languages show nominal encoding of adjectives which we analyse by assuming the relevant  $v^a$  undergoes excorporation. In Korean, as seen in (6), adjectives are allegedly indistinguishable in their core distribution from verbs, pace Kim (2002). We propose to analyse adjectives in Korean and similar languages by using an obverse excorporation mechanism; in this scenario it is the nominal element  $v^a$  that undergoes excorporation, leaving the internal layer of the adjective to take on verbal properties.

The last typological group in (18), the so-called mixed one, includes a subgroup of languages that allow for both verbal and nominal categorial behaviour of adjectives. We believe this subgroup is best analysed by appealing to optionality in the parameter that obligates the excorporation of one, and only one, categorial element from within the composite head  $n-v$ . For this subgroup, where free variation is presumably operative, we also find diachronic patterns which support the view that optionality in terms of adjectival encoding arose, or stabilised, in time. Japanese is understood to be such a language, splitting the adjective class between noun-like adjectives and verb-like adjectives (Miyagawa 1987; Iwasaki 1999: Ch. 4), possibly along lexical lines: verb-like adjectives are derived from native Japanese roots and constitute a closed class, while noun-like adjectives are derived from Chinese roots but are a morphologically productive class.



Although a parameter deciding whether the initial symmetry of the  $n$ - $v$  complex is broken by  $v$ - or  $n$ -excorporation goes some way towards explaining the typological picture, there is a serious matter arising. This matter is no other than explaining what factor decides whether  $v$  or  $n$  excorporates, giving the corresponding “nominal” or “verbal” character to the adjectival constituent respectively. Simply positing that “nouny” adjectives result from  $v$ -excorporation and “verby” ones from  $n$ -excorporation describes but hardly explains. In other words, simply stipulating the descriptive generalisation in (19) is ad hoc and necessitates that grammar look ahead at the interface with the Articulatory-Perceptual systems, the ‘PF’, so as to “know” what kind of morphological flavour an adjective will acquire.

(19) *Different adjective flavours*

- a.  $v$ -excorporation out of a composite head  $n$ - $v$  gives the adjective a nominal character.
- b.  $n$ -excorporation out of a composite head  $n$ - $v$  gives the adjective a verbal character.

In order to resolve the thoroughly undesirable ad hoc character of the above generalisation, we have to investigate what grammar-internal reason would be responsible for deciding which categoriser excorporates. As look-ahead to the interfaces is out of the question, we believe it is a question of each categoriser’s featural makeup:

- (20) When an element is categorised by  $n^a$  and  $v^a$  in tandem, the symmetry is broken via the excorporation of the most featurally defective categoriser.

In the following section we will elaborate on why categoriser defectivity matters and how it leads to excorporation of  $v$  or  $n$  in adjectival structures, something which in turn decides its nominal or verbal flavour at the Articulatory-Perceptual interface – and before.

### **3.2 A metric for categoriser defectivity – and its relevance**

Let us investigate how categoriser defectivity leads to its excorporation within adjectival structures. Let’s begin with the already examined case of Indo-European adjectives, where  $v^a$  excorporates, as illustrated in (15). The adjective is externally verbal because it is modifiable by adverbs, as

discussed in the context of (12) and (13), and the internal is nominal, displaying nominal concord etc. However, the Indo-European adjective's nominal and verbal characters are not equipotent: even at a pre-theoretical level the nominal aspects of these adjectives are evident, whereas the verbal aspects only detectable via adverbial modification and, possibly, their relational function.

Translating the above observations into grammar-theoretic terms we can claim that the categorisers participating in making Indo-European adjectives have at least the features described below. The nominaliser  $n^a$  bears its categorial feature [N], an unvalued gender feature responsible for gender concord, as in (10) and (11) and unvalued number and case features responsible for the respective aspects of concord, where applicable.<sup>16</sup> At the same time, the verbaliser  $v^a$  seems to bear just its categorial feature [V] and nothing more. In other words, the  $v^a$  participating in the formation of Indo-European adjectives is a minimal one, just a [V] feature, bearing even fewer features than the already defective  $n^a$  it enters the derivation with.

Therefore, according to (19), the verbaliser excorporates, as the most defective of the two categorial heads. Perhaps the verbaliser's zero exponence can also be correlated with its featural defectivity, i.e. its bearing just a [V] feature, see footnote 12.

The resulting picture seems to be as follows: when the composite  $n-v$  head merges with the root (or with the constituent to be adjectivised), one of the two categorisers will excorporate, for the reasons already detailed. It turns out that the lighter categoriser of the two will excorporate, i.e. the categoriser of the two bearing the fewer features: the more defective one. So, in Indo-European it is the verbaliser  $v^a$  that excorporates, as in (15), and in Korean it is by hypothesis the nominaliser  $n^a$ . The excorporating categoriser sets the external behaviour of the adjective: verbal for Indo-European, nominal for Korean.<sup>17</sup> Moreover, as argued above, excorporation of one of the two categorisers extends the first categoriser phasal space, eventually rendering the whole "adjective" projection a single phase.

Granting that adjective projections constitute single phases, their derivation works like this: once the composite head is merged, grammar expels the lighter/more defective categoriser, which excorporates, so that the resulting phase edge is defined by the said lighter/more defective cate-

<sup>16</sup> Alternatively,  $n$  supports the functional head responsible for number and case concord, as claimed in the *Nominal Interior* subsection.

<sup>17</sup> In Korean, a comparison between adjectives and verbal nouns (which are mixed projections) would be in order – see Panagiotidis (2010) for some pointers and suggestions.

goriser, while the heavier/less defective one stays put. The precise nature of this mechanism will have to be investigated in future research but let us just point out that the whole affair is hopefully not a more local version of look-ahead: we therefore expect that if the heavier  $n^a$  would excorporate to the phase edge in, say, Indo-European, then we would either get a different non-adjectival structure (which we cannot identify at this point) or a crash.

This mechanism predicts that excorporation, conditioned by categoriser defectivity, can swing either this or that way, depending on the feature content of the actual categorisers  $n^a$  and  $v^a$  making up the initial composite head. This would mean that in some languages, depending on the feature content of the categoriser, sometimes the  $n^a$  and sometimes the  $v^a$  would excorporate, giving us some “verby” Korean-style adjectives and some “nouny” Indo-European-style ones. At a first pass this is the case of Japanese as described by Miyagawa (1987) and Iwasaki (1999: Ch. 4). This seems to make some sense given that there exist Japanese roots that can yield both “nouny” and “verby” adjectives, e.g. *atataka-*, which gives verb-like *atataka-i* and noun-like *atataka-na*, both meaning “warm” (Hisashi Morita, p.c.).

The claim in (20) that the more defective categoriser of the two is the one that excorporates might also shed light on the fact that adjectival morphology is typically not bimorphemic – recall the discussion under (11) and (14). As illustrated in the diagram in (15), the categoriser that stays put not only remains adjacent to the root, but it is also by hypothesis the one that has some features beyond the categorial one to contribute, say unvalued gender. At the same time, the monophasal adjectival projection is labelled externally by the excorporating categoriser, the very same one that is defective. At this stage we can hope that this situation provides an environment suitable for spanning (Merchant 2015), or a similar operation, that would match this complex structure with a single Vocabulary Item (in Distributed Morphology terms). This Vocabulary Item could be either noun-like (or verb-like, in languages where  $n$  excorporates) or a “special” one, like English *-ic*, *-ous*, etc.

Even more intriguingly, it could be possible that both categorisers deriving an adjective are equally defective. The extreme scenario would be a composite  $n$ - $v$  head consisting of an  $n^a$  bearing only [N] and a  $v^a$  bearing only [V]. In this case, the correlation of categoriser defectivity with excorporation and of categoriser (relative) richness with morphological manifestation in (20) becomes moot. Would in such a scenario excorporation be completely optional? Perhaps, if both categorisers are equally and rad-

ically defective, the adjectives yielded would look neither like nouns nor like verbs, as in the first of the subgroups in (18c). Languages with such adjectives, together with Japanese-type languages that have both nouny and verby adjectives, seem to constitute up to 27% of the world's languages, at least according to WALS.

**Table 1:** Morphological containment.

	<b>interior</b>	<b>exterior</b>	<b>excorp. head</b>	<b>instantiation</b>
a.	nominal	verbal	$\nu$	Indo-European
b.	verbal	nominal	$n$	Korean
c.	both	neither	neither $n$ nor $\nu$	impossible

## 4 Conclusion

Adjectivisers do not exist and cannot exist; this is so either because there is no categorial feature for adjectives or because a two-feature specification for adjectivisers would run into conceptual and empirical problems, the latter of a typological character. Moreover, we argue adjectives are bicategorial, the result of categorisation by a composite  $n$ - $\nu$  head. This goes a long way towards explaining the fact that adjectives lack “positive properties”, capturing their relational nature and, perhaps, underlying the scalar propensities of the Adjective category. Even more strongly, the bicategoriality of adjectives can capture their categorial ambivalence typologically, which now can be derived from which categoriser excorporates.

## Abbreviations

ACC = accusative, DAT = dative, DECL = declerative, NOM = nominative, PL = plural, REL = relative, SG = singular

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The authors have no competing interests to declare.

## Authors' contributions

Both authors are first authors, listed alphabetically.

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