

## Problems and questions in adjectival derivation\*

**ABSTRACT.** This article presents an overview of the main problems and complications that have emerged with respect to the analysis of morphologically complex adjectives cross-linguistically. It is argued that the problems start from the fact that it is difficult to identify positive properties of adjectives that single them out from other categories. Given this difficulty, what has been classified as a derived adjective frequently is a version of the base category that lacks some of the definitional properties of that category. This article examines in turn the questions related to deverbal adjectives, participles and denominal adjectives.

**Keywords:** derivation, adjectives, participles, lexical categories, classification

### 1. Introduction: some first problems in the study of complex adjectives

One of the central problems in linguistics is the nature of lexical categories: how many there are, how universal or language particular they are and what kinds of relations they establish to each other, and to functional items. Morphology provides us with a unique tool to address these questions through the detailed description and analysis of category-changing operations cross-linguistically. The goal of this volume is to consider the nature of adjectives through the study of the morphological operations that produce adjectives from verbs and nouns in a variety of languages.

There is an enormous literature about the nature of lexical categories and their potential universality (Ross 1972, Croft 1991, 2003, Hale & Keyser 2002, Baker 2003, Rauh 2010, Panagiotidis 2014, Wiltschko 2014, to name just a few), and there are also plenty of studies addressing the nature of adjectives as a lexical category (Dixon 1977, 2004, Bhat 1994, Wetzler 1996, Stassen 1997, Cabredo Hofherr 2010). However, there are much fewer studies that deal with the problem of derived adjectives. It is fair to say, in our opinion, that perhaps for purely historical reasons most of the theoretical work on category change has concentrated on nominalisations –that is, complex nouns–. Complex adjectives have received much less attention, with two significant exceptions: *-able* deverbal adjectives (see §3) and participles (see §4, and also Wasow 1977, Levin & Rappaport 1986, Varela 1992, Borgonovo 1999, Kratzer 2000, Embick 2004; Anagnostopoulou 2003, Emonds 2006, Mittwoch 2008, Alexiadou & Anagnostopoulou 2008, Sleeman 2011, McIntyre 2013, Bruening 2014, to name just a few). And still, adjectival derivation introduces an interesting set of problems that, arguably, are not central in the case of derived nouns or derived verbs.

A first specific problem is to determine whether an affix produces primarily nouns or adjectives. This problem does not typically arise when we consider verbal derivation, or nominalisations; however, it is an interesting property of some affixes that they seem to be able to produce both nouns and adjectives. One such case is Spanish *-dor*. We document nouns (1a), adjectives (1b) and words that can be used as both (1c):

- (1) a. un (\*hombre) fuma-dor  
      a man smoke-er  
      ‘a smoker’  
      b. un \*(animal) vola-dor  
      a animal fly-er  
      ‘a flying animal’  
      c. una (máquina) seca-dor-a  
      a machine dry-er-F

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\* The following abbreviations are used in this article: DIM (diminutive), F (feminine), M (masculine), PL (plural), SUPL (suppletive), WM (word marker).

‘a dryer / a drying machine’

We could treat *-dor* primarily as a nominaliser, and claim that cases like (1b) and (1c) come through N-to-A conversion; we can treat it as an adjectiviser and claim that (1a) and (1c) are due to A-to-N conversion, or we can treat *-dor* as an underspecified affix that produces both nouns and adjectives. Finally, we could treat such morphemes as category-neutral roots which are then categorised by functional (adjectival and nominal) projections, as Lowenstamm (2015) does. The answer is not simple, and, we believe, for two reasons. One is that the possible constraints on what conversion allows are still poorly understood (e.g., how frequent is N-to-A conversion?; see Bauer & Valera 2005). The second, in our opinion, is a deeper problem: we still lack a positive characterisation of what an adjective is cross-linguistically. At the current state of knowledge, we have different proposals about what defines a noun or what defines a verb, even from a conceptual perspective (what kinds of concepts only these categories can denote). It is much less clear what an adjective is, as we will argue in §2; languages have been identified that seem to lack an adjectival category, and notions like gradability or noun modification are not exclusive of adjectives in languages that have them. Without an initial theory of what an adjective is, it becomes extremely difficult to take independent decisions about suffixes like those in (1).

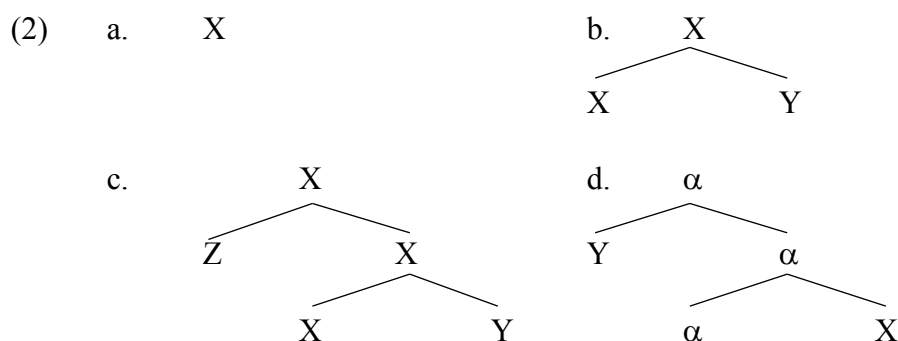
Second, in contrast to nominalisations or verbalisations, we seem to lack a complete typology of the classes of adjectivalisations that natural language allows. Nominalisations are typically classified in three classes depending on the nature of their base since Grimshaw (1990; see also Alexiadou 2001): complex event nouns, simple event nouns and result (or participant) nouns. Verbalisations are classified using richly studied classifications based on Aktionsart or argument structure, (cf. (un)accusativity and unergativity), which relate the types of derived verbs with the nature of their category base (e.g., the study of degree achievements in relation to the properties of their underlying adjectival scales, Hay, Kennedy & Levin 1999, or the relation between transitivity and the nominal or adjectival nature of their base, Hale & Keyser 2002). We lack an equivalent classification of complex-adjective types, even though we have come to know a lot about different conceptual and grammatical classes of adjectives (e.g., Sproat & Shih 1988, Kennedy & McNally 2005, Cinque 2010). If in the case of nominalisations and verbalisations there are theories and hypotheses –which might be right or wrong, but at least are formulated– about how the properties of the derived form relate to the properties of their base, we are not aware of equivalent theories relating, say, the nature of a base noun and the expected behaviour of the corresponding derived adjective (with the exception of the relation between Aktionsart and scalarity mentioned in §3.2.).

The articles gathered in this volume contribute, each one from a different side, to gaining a better understanding of some of these questions: Which criteria can be used to identify a complex adjective? What are some of the classes of adjectivalisations that we document in natural language? What does it mean for a verb or a noun to become an adjective?

The rest of this chapter is structured as follows. §2 deals with the crucial problem of what kind of object an adjective is. §3 deals, specifically, with deverbal adjectives, and highlights some of their common properties. These properties are quite different in many cases from those that we see participles display, and that is the goal of §4. §5 discusses denominal adjectives, and §6 summarises the main research questions that, in our opinion, are raised by the study of adjectival derivation.

## 2. The definition of adjectives as a lexical category

In pursuing these goals, we face one complication: it seems extremely difficult to identify positive properties that characterise the category called ‘adjective’, even if we set as our humble goal to define ‘adjectives’ in one single language. Consider, for instance, Bhat’s (1994) wide-ranging typological study. This author manages to identify a number of negative properties of adjectives –properties that they lack with respect to nouns or verbs–: inability to identify participants (1994: 18; cf. also Wierzbicka 1980), inability to denote events (1994: 19), vagueness (1994: 28; cf. also Kamp 1975), inability to behave as predicates by themselves (1994: 48), inability to denote changes across time (1994: 63), etc. A similar conclusion is reached in Baker (2003), where adjectives are explicitly defined negatively: those words that lack the positive properties of nouns or verbs. For Baker, nouns are the only categories that bear an index of identity that can be used to make statements about sameness (2003: 95-101); adjectives lack it. Verbs are the only categories that can directly –that is, in their own lexical projection– introduce a subject of predication (2002: 22-34); adjectives are unable to do so. Baker (2008) further introduces as a negative property that adjectives, unlike verbs, are unable to agree in person. While Croft (2012) is able to propose a rich and detailed characterisation of what a verb is able to do from a cross-linguistic perspective, the treatment of adjectives in his own research (e.g., 1991) is able only to define them functionally as the category that prototypically (but not exclusively) can perform noun modification. Panagiotidis (2014) is able to propose a definition of nouns and verbs –the first, classifiers of kinds, and the second classifiers of events–, but he largely treats adjectives as a problem for any theory trying to give a non-parochial theory of lexical categories (2014: 175). In a slightly different dimension, Hale & Keyser (2002: 159) treat English adjectives as the only category which is unable to satisfy its licensing conditions autonomously. While nouns are defined as heads without arguments (2a), verbs as heads with one argument (2b) and prepositions as relational heads with two arguments (2c), adjectives are categories that need a subject but are unable to introduce it by themselves, which forces them to parasitically combine with another category ( $\alpha$ ) to do so (2d). A way to interpret this (Mateu 2002) is as the claim that adjectives (universally) are not lexical primitives, but need to be derived by combining (for instance) a noun with a preposition.



See also Ramchand (this volume) for a similar conclusion that sets adjectives apart from the other predicates. While one can, of course, contend that the positive characterisation of nouns and verbs is more complex than what these works suggest (see for instance Rijkhoff 2002 for some empirical facts, and Laudanna 2002 for processing evidence that the noun-verb distinction is more continuous than discrete), it seems to us fair to say that, if there is a positive property that defines adjectives, we

have not found it yet. This claim might not be controversial, but we would like to use a few paragraphs to show why we believe that it is right. In traditional grammars, there are a few properties that are used to define adjectives.

- a) Syntactic properties: adjectives are used to modify nouns and can be the center of comparative constructions
- b) Semantic properties: adjectives combine with degree modifiers and are used to denote properties
- c) Morphological properties: adjectives agree with nouns and combine with degree morphemes

Our immediate goal is to show that these properties do not define adjectives as a natural class (that is, that for any of these properties, it is not the case that all adjectives have it, and no word belonging to a different class lacks it), not even in one single language.

Consider Spanish. It is true that virtually all words that have been classified as adjectives in this language can be used to modify nouns,<sup>1</sup> but of course other nouns in compound-like constructions (3a) and prepositional phrases (3b) can also modify nouns, sometimes without any apparent meaning difference (compare 3b and 3c). Thus, this cannot be the positive, exclusive property of adjectives used to define them (contra Vogel 2000, where languages that have adjectives activate a feature [+modifier]).

- (3)
- a. una oferta estrella  
an offer star  
'the best offer'
  - b. un objeto de metal  
an object of metal
  - c. un objeto metálico  
an object metallic

Thus, at least with respect to this property, adjectives are part of a continuous scale where compounds and PPs also belong (see Sokolova & Edberg this volume for a case study of Russian along these lines; see Spencer & Nikolaeva this volume for a proposal where the degrees of adjectivisation depend on the nature of the operation used to build them). With respect to comparative structures, in the same way that not all adjectives allow degree modification (cf. *infra*), not all adjectives can be the lexical core of a comparative structure (4a); it is obvious that mass nouns (4b) and other lexical classes can easily be the core of a comparative which on the surface uses the same set of elements as a gradable adjective (4c).

- (4)
- a. \*un objeto más metálico que otro  
an object more metallic than another
  - b. tiene más amor que otro  
he.has more love than another
  - c. es más guapo que otro

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<sup>1</sup> This is, by the way, not true of English. Bolinger (1967) noted that an adjective like *asleep* can only appear in predicative position: \**an asleep boy*; *The boy is asleep*. As an anonymous reviewer (to whom we are grateful) points out, this could be an argument that *asleep* originates as a PP, and as all other PPs, cannot precede the NP.

he.is            more handsome            than            another

In fact, not all adjectives allow degree modification (saliently, relational adjectives and non-subjective adverbial adjectives; cf. Bosque 1993, 2006; Fábregas 2007; Partee 2010) (5a); other lexical classes, like stative verbs (5b) allow combination with adverbs expressing degree.

- (5)    a. \*muy {carbónico / textil / presunto}  
          very carbonic / textile / alleged  
      b. gustar mucho  
          like    a.lot  
          ‘to love to a high degree’

With respect to their semantic denotation, we would like to remind the reader that in a model semantic analysis adjectives have the same type as nouns and monotransitive verbs ( $\langle e,t \rangle$ ) or PP modifiers ( $\langle \langle e,t \rangle, \langle e,t \rangle \rangle$ ) (Heim & Kratzer 1998). If the difference is not based on semantic type, then, it could be sortal. However, claiming that they denote ‘properties’ is not of much help in the absence of a positive definition of ‘property’ that differentiates it from states or other descriptive terms; but even if we take a common-sense, intuitive definition of property (as opposed, say, to ‘individual’ or ‘event’), it is not true either that adjectives invariably denote properties. Relational adjectives can, in fact, introduce participants of a situation (6a); non-subjective adjectives (6b) and privative adjectives (6c) instead of adding further properties to the denotation of the noun act as operators that shift the model world or cancel the entailments of the noun’s denotation.

- (6)    a. la    invasión alemana de Italia  
          the invasion German of Italy  
          ‘the German invasion of Italy’  
      b. Esto es un posible problema  
          this is a possible problem  
          Note: It does not entail that this is a problem.  
      c. Esto es una falsa pistola.  
          this is a fake gun  
          Note: It does entail that this is not a gun.

If we move to morphology, an area where considerable cross-linguistic variation is attested, not even in a highly inflectional language like Spanish can one say that all adjectives, and nothing else, agree for gender and number with the noun (7a). Some adjectives agree only in number (7b), while others lack agreement in both dimensions (7c). Also, gender and number agreement is typical of other distinct word classes, like quantifiers and determiners (7d).

- (7)    a. pantalones<sup>M.PL</sup> roj-o-s  
          trousers            red-M-PL  
      b. pantalones<sup>M.PL</sup> naranja-s  
          trousers            orange-PL  
      c. revistas<sup>F.PL</sup> porno  
          magazines        porn  
      d. l-a-s            much-a-s            preocupaciones-F-PL

the-F-PL    many-F-PL    worries

Finally, let us concentrate on the combination with degree morphology. Obviously, not all adjectives combine with it (8a), as the classes of relational and non-subjective adjectives mentioned before simply reject any degree modification. But adverbs in Spanish can also carry degree morphology (8b). One could claim that these adverbs are underlyingly adjectives, but note that appreciative morphology is in some cases semantically similar to degree operators (compare 8b with 8c) and nouns can, like adjectives, combine with it (8d). Finally, one way of interpreting Grandi's (2008) analysis of verbal interfixation is that verbs can combine with morphemes that manipulate the degree or intensity with which the action takes place (9).

- (8) a. \*carboniqu-ísimo, \*presunt-ísimo  
      carbonic-SUPL    alleged-SUPL  
      b. cerqu-ísim-a  
          near-SUPL-WM  
          'very far away'  
      c. cerqu-it-a  
          near-DIM-WM  
          'quite far away'  
      d. actor-cillo  
          actor-DIM  
          'someone who works as an actor, but not very well'
- (9) a. comer  
      eat  
      b. com-isc-ar  
          eat-INFIX  
          'to eat irregularly, in small portions'

Even if we restrict ourselves to one single language, it does not seem possible to identify one positive property that defines adjectives as a natural class. There are two natural reactions: the first is to talk about 'unmarked' (Croft 1991) or 'primary' (Bhat 1994) uses of adjectives –presumably, quality denoting gradable adjectives used as modifiers–, allowing grammar to alter this category in substantial ways that account for the wide range of non-prototypical cases. The second is simply to conclude that there are no positive properties of adjectives. Only the second proposal makes sense of the fact that all 'primary' properties of adjectives are attested in some members of other lexical classes.

An additional piece in the puzzle is the proposal that adjectives, as a distinct morphological category, is lacking from some languages, as argued at length for instance in Stassen (1997). McCawley (1992) claimed that Mandarin Chinese lacks adjectives; Muna (van der Berg 1989), Swedish Sign Language (Bergman 1983), Acehnese (Durie 1985) and some varieties of Aleut (Golovko & Vaxtin 1990) are among the languages of this kind; see Rijkhoff (2000) for a proposal where only languages where nouns can have a spatial boundary have adjectives. This, again, makes sense if there is nothing substantive paired with the lexical class of adjectives: a language can be perfectly functional without words of this class, because other lexical categories would play the roles that they play. It is worth noting, however, that the issue is controversial: see Baker (2003) for the claim that all languages have adjectives.

But now, if adjectives lack positive properties, does it make sense to have a morphological structure like (10a), or alternatively a function like (10b) –depending on the status of morphemes in your theory, which is independent of our claims–?

- (10) a. 
$$\begin{array}{c} \text{A} \\ \diagdown \quad \diagup \\ \text{A} \quad \quad \{N/V\} \end{array}$$
- b.  $F(N/V)=A$

In a system where words have internal (morphological or syntactic) structure, category change is interpreted as subordination; (10a) is intended as a subcase of this, a situation where another lexical category is subordinated to A. The consequence is that now, the whole (a word) would display the distribution and properties of an adjective. (10b) is a function that modifies the properties of another lexical category to produce a word that has the properties of an adjective. But if the adjective does not have positive properties, what are the properties that are imposed over the other category in order to produce an adjective? What force can a category without positive properties have in order to overwrite the positive properties of a noun or verb? The answer to this question is, to our mind, not obvious, but here we want to note the difficulty of making sense out of (10) in the absence of a positive definition of what an adjective is. One could adopt the alternative view that ‘becoming an adjective’ in fact means for a noun or a verb losing (part of) their positive properties, in which case being ‘adjectival’ would mean ‘not being verby enough’ and ‘not being nouny enough’, respectively.

### 3. Deverbal adjectives

Let us evaluate the potential impact of this problem from the perspective of adjectives derived from verbs. Leaving aside the case of participles, which are singled out in a variety of ways (see §4 below), there are several common properties of these complex words.

#### 3.1. Stativity and non-episodicity

The first one is that, independently of the Aktionsart of the base verb, deverbal adjectives denote non-dynamic situations –result states or stativised events–; moreover, they are unable to refer to specific episodic events that are located in a specific time and place (cf. Fábregas 2016). Consider, for instance, (11) and (12), where we illustrate with the suffix *-able* in English:<sup>2</sup> as a verb, *break* denotes a change of state and can be used to refer to an episodic event (11). (12), however, does not describe a change of state or any other episodic event: it is a predicate (cf. Ultra-Massuet 2010: 18) that does not state that the glass has broken or will break; it just states that its internal properties make it possible that it breaks, given the right conditions.

- (11) a. break  
b. The glass broke.

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<sup>2</sup> The literature on this suffix is so extensive that it is impossible to do it justice here. Some of the central works in this topic include Chapin (1967), Aronoff (1976: 121-129), Kayne (1981), Val Álvaro (1981), Fabb (1984), Anderson (1992: 186-195), Riehemann (1993), Gràcia (1995), Steriade (1999), Nevins (2002), Volpe (2005) or Ultra-Massuet (2010).

(12) The glass is break-able.

Non-episodicity and inability to entail a change of state or a dynamic event define all deverbal adjectives, with the exception of participles, but there are different ways of being non-episodic. The following list is probably not exhaustive, but to the best of our knowledge it captures the main non-episodic readings attested with deverbal adjectives:

(i) Habitual reading: the entity is characterised by its typical participation, across an extended time period, in an eventuality

(13) oublier - oublieux [French]  
forget - forgetful

(ii) Dispositional reading: the entity is described as one whose internal properties determine a tendency to participate in an eventuality, given the right conditions:

(14) alda-kor [Basque]  
change-KOR  
'changeable, that tends to change'

(iii) Potential reading: the entity is characterised by having properties that, potentially, could allow participation in an eventuality.

(15) ule-garri [Basque]  
understand-GARRI  
'understandable, that can be understood'

(iv) Deontic or normative reading: the entity has internal properties that should lead to its participation in an eventuality if the rules of a context are followed.

(16) mires-garri [Basque]  
admire-GARRI  
'admirable, that is worthy of admiration'

(v) Impossibility reading: the internal properties of the entity make it impossible that it participates in an eventuality.

(17) froga-gaitz [Basque]  
demonstrate-GAITZ  
'impossible to demonstrate'

[Basque data apud Azkarate & Gràcia 1999]



In none of these readings it is entailed that the entity has participated in a specific instance of the eventuality in the actual world.<sup>3</sup> The question is why, and three options suggest themselves:

(a) The notion of ‘property’ that the adjective imposes over a verb directly produces the recategorisation of the denotation of the base, in such a way that its internal temporal structure is ignored and becomes unavailable for existential closure by tense. This would force a stative reading involving non episodicity. The challenge, as we have mentioned, is to find a precise enough definition of ‘property’ and a set of positive properties of the category ‘adjective’.

(b) The non-episodicity comes as a direct result of the presence of operators that bind the eventuality and make it unavailable for further existential closure by Tense. It is relatively uncontroversial that modal readings involve operators that bind the event; habituais have been treated as operators in, for instance, Chierchia (1995). If an intensional operator is part of the make-up of all deverbal adjectives, this could be an interesting alternative to explore that would not force the presence of an adjectival function whose properties are difficult to identify (see Oltra-Massuet 2014 for a proposal along these lines). (18a) would show a ‘classic’ structure for a deverbal adjective, while (18b) would represent the alternative without AP where the non episodicity is obtained by letting the operator bind the eventuality.<sup>4</sup>



(c) An account based on reduction: what we call a deverbal adjective is actually a verb that has lost the pieces of information that allow it to define a change of state or an episodic event. This might be technically implemented in several ways: the verb might be lexically reduced, losing its event argument; episodicity might depend on layers higher than V that are missing from the ‘adjectival’ version, etc.

The range of options is probably even wider, and we do not want to imply that any of these roads is free of problems; however, given the difficulty of identifying positive properties for adjectives, we believe that these options deserve at least some thought.

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<sup>3</sup> To the best of our knowledge, the only case of an adjective class that seems to be able to denote specific episodic participation in an event is evaluative adjectives (those describing the behaviour of animate beings) like *cruel*, *intelligent*, *nice*, *obnoxious*, etc., in sentences like (i).

- (i) John was nice in opening the door for her.

Note, however, that (a) they are never derived from verbs, in any obvious sense, and (b) this is not their only use, as they can be used also to describe the characteristic properties of an entity, human or not (ii).

- (ii) a. John is nice.  
b. The party was nice.

See, among others, Stowell (1991), Arche (2006) and Kertz (2006).

<sup>4</sup> In a system without morphemes, this would mean that instead of a function  $F_{\text{adjective}}(\text{V})$  we would have a function  $F_{\text{potential}}(\text{V})$ ,  $F_{\text{habitual}}(\text{V})$ , etc. that applies before the function that assigns temporal inflection and blocks further application of temporoaspectual inflection.

### 3.2. Scales and aspect

Interestingly, a deverbal adjective does not project the base's Aktionsart in the temporal domain, but it has been claimed that the aspectual information is not completely ignored. Kennedy & McNally, in a series of articles (Kennedy & McNally 1999, 2005), have proposed that the Aktionsart is mapped to scale-structure in deverbal adjectivalisation. In their system, they differentiate between four classes of scales: completely open scales (19), completely closed scales with a maximal and a minimal degree (20), scales with only a maximal degree, but no lower bound (21) and scales with only a minimal degree, and no upper bound (22). As the following examples show, different degree modifiers are compatible with each kind of scale. *Completely*, for instance, seems to select scales with an upper bound; *slightly* selects scales with a lower bound.

- (19) Open scale: ....v....
  - a. tall
  - b. {\*completely / \*slightly} tall
- (20) Closed scale: [...v....]
  - a. drunk
  - b. {completely / slightly} drunk
- (21) Upper-closed scale: ...v...]
  - a. clean
  - b. {completely / \*slightly} clean
- (22) Lower-closed scale: [...v...
  - a. dirty
  - b. {\*completely / slightly} dirty

They contend that deverbal adjectives build, at least in part, their scales using the ingredients provided by Aktionsart to do so. Telic verbs are expected to have a maximal degree (which translates the culmination of the event, 23); atelic verbs would lack it, as they also lack a natural endpoint. Kennedy & McNally (2005) suggest that these expectations are confirmed at least for English, but note that they use participles in their tests, and we will see that participles have special properties (cf. §4).

- (23) ...e...] --> ...v...]
- (24) a. build a house (telic)
  - b. a house completely built
- (25) a. drag (towards the window) (atelic)
  - b. (\*completely) dragged (towards the window)

### 3.3. Deverbal adjectives and argument structure

Another dimension that shows evidence that adjectival derivation is difficult to characterise with positive properties is the thematic interpretation of their subjects. In the verbal domain, there is plenty of evidence that the thematic structure of the verb correlates to some extent with its Aktionsart (see Jackendoff 1990, Levin & Rappaport 1995, Ramchand 2008, among many others). Moreover, in the verb's argument structure it has been claimed that there are correlations between the height of an argument and the theta-role it gets assigned (Baker's 1988 UTAH; see also DiSciullo & Williams 1987: 28-45 for theta-role assignment inside complex morphological structures). None of these two principles are satisfied in any obvious

sense inside the adjectival domain. First of all, the vast majority of adjectives assign to their subjects what seems to be a default theta-role, a theme-by-default representing the entity that exhibits a property. Second, the type of scale (26) or the Individual-level / Stage-level (27) divide do not correlate with different theta roles:

- (26) a. tall man<sub>theme</sub>  
 b. drunk man<sub>theme</sub>  
 c. clean table<sub>theme</sub>  
 d. dirty table<sub>theme</sub>
- (27) a. handsome firefighters<sub>theme</sub>  
 b. available firefighters<sub>theme</sub>

Third, as shown for instance in Meltzer-Asscher (2012), the different theta-roles associated to deverbal adjectives, even if they are partially conditioned by the semantics of the verbal base, end up in the same position inside the adjectival domain: specifier of PredP.

Finally, the thematic interpretation of the adjective's subject is only partially conditioned by the base verb and the affix. It is true that there are some affixes that seem to prefer a subset of theta roles; one clear case is the agentive *-nte* (Cano 2013) suffix in Spanish, which forces a causer / agent interpretation on the noun it modifies.

- (28) trabajo agobia-nte  
 job stress-NTE  
 'stressing job'

However, it is not true that all deverbal adjectives with *-nte* introduce causer or agent subjects. If this was true, the suffix would only combine with agentive or causative verbs, but unaccusatives are also possible:

- (29) sol nacie-nte  
 sun be.born-ing  
 'rising sun'

The suffix can also appear with experiencer subjects:

- (30) hombre sufrie-nte  
 man suffer-NTE  
 'suffering man'

The modal suffix *-ble* 'able' has been claimed to be passive in the literature; it is true that the vast majority of formations with this suffix take a patient or theme subject – by the way, like most adjectives, derived or not–, but, although less common, it is not impossible to find words where the subject is interpreted as a causer:

- (31) hombre agrada-ble  
 man please-BLE  
 'pleasant man' (not \*'man that can be pleased')

Oltra-Massuet (2010) proposes for cases like this a structure different from the one associated to the cases where *-ble* takes a non-agentive subject. But this situation is

not exclusive of *-ble*. Consider the suffix *-tivo* ‘tive’. With this affix we also find cases where the noun is interpreted as a causer / agent (32a), and cases where it is interpreted as a theme / patient (32b).

- (32) a. *adic-tivo*  
addict-tive  
‘that causes addiction’  
b. *exclama-tivo*  
exclaim-tive  
‘that is exclaimed’

See Ramchand (this volume) for a case study where she analyses a class of English adjectives that alternate in what seems to be a causative and an inchoative construal. Her conclusion is, ultimately, that adjectives must be very different syntactically from verbs, and display a much more restricted range of argument possibilities.

#### 4. A short note on participles: what makes them special

Participles, and specially past passive participles, are singled out from the rest of deverbal adjectives in a number of ways. The literature that discusses the properties of participles is too extensive to try to do it justice here (see Arche, Fábregas & Marín 2014 for a recent overview), so for reasons of space we will just focus on the differences with respect to other deverbal adjectives.

We saw that deverbal adjectives tend to produce non-episodic readings; this is not the case with participles. Past participles are productively used –as result state participles (Kratzer 2000)– in readings where they entail that their subject of predication has actually participated in a specific occurrence of the event. This refers to passive (33a) participles; with respect to active past participles (33b, Varela 2003, Armstrong 2014) the most natural interpretation seems to be habitual, although episodic readings are not excluded (33c).

- (33) a. a broken car  
--> the car participated in a specific breaking event  
b. a well-read man  
--> the man participates habitually in reading events, beyond what is usual  
c. un hombre bien dormido Spanish  
a man well slept  
--> the man has participated in a specific sleeping event

(33a) and (33c) are significantly different from other deverbal adjectives, which talk about the potentiality, impossibility, obligatoriness, dispositionality or habituality of participating in an event. In the case of active participles, the entailment of episodicity can also be present (34a), next to possible non-episodic readings (34b).

- (34) a. that flying object  
---> the object is flying now (episodic)  
b. a flying bird  
--/-> the bird is flying now  
‘a bird that can fly’ (potential, non-episodic)  
‘a bird that typically flies’ (dispositional / habitual, non-episodic)

The capacity of participles to refer to episodic events is presumably related to the fact that the same morphemes that produce these deverbal adjectives can as well participate in verbal inflection, to the point that, since Wasow (1977), it is accepted that the same participle can have verbal and adjectival manifestations. It is less clear, however, how this special behaviour translates into a technical analysis. One could venture to propose that, while ‘adjectivisers’ like *-able* or *-ful* compulsorily introduce operators of different classes, the participial morphology (although compatible with those operators) is independent of them, which would leave the event variable open for existential closure at the TP (Tense Phrase, labeled InFlP during the 80s) level. In relation to this, remember also that (at least in English, cf. Kennedy & McNally 1999) participles seem to translate in a direct way the Aktionsart information of the verbal base into scale structure. Again, this could suggest that participle-formation allows for a more direct projection of the verbal properties than the one found with other classes of deverbal adjectives.

### 5. Denominal adjectives

Let us now move to adjectives derived from nouns, where essentially the same set of problems and questions as before emerges: given the lack of clear positive properties of adjectives, what does it mean for a noun to become an adjective? What kind of operation performs this change?

There is, however, one important difference that is implicit in the works that have treated denominal adjectives: while in the case of deverbal adjectives it is unclear that the verb has gained any property through the adjectivalisation process, in the case of denominal adjectives there are two arguable properties that could be claimed to be associated to the category change:

- a) In languages where compounding is restricted (Snyder 1995) and thus we can exclude a structure with N-N compounding for (35a), the noun becomes now able to modify another noun without the (surface) help of prepositions

- (35) a. \*decisione presidente [Italian]  
           decision president  
       b. decisione presidenz-iale  
           decision presidential

- b) Although not all denominal adjectives are gradable, some nouns become gradable as a result of the category change:<sup>5</sup>

- (36) a. \*muy barriga [Spanish]  
           very belly  
       b. muy barrig-udo  
           very belly-UDO  
           ‘very potbellied’

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<sup>5</sup> However, it is not clear that gradability is a positive property: it is unlikely that there is a feature [gradable] that some heads have. In fact, it could be that gradability is an effect of the head lacking a defined truth value. The way in which we interpret Kamp’s (1975) influential proposal to differentiate between nouns and adjectives, gradability can be seen as an automatic consequence of a predicate’s vagueness; nouns would not be gradable, then, because they are sharp predicates that exhaustively classify referents into sets.

From one perspective, this makes the problem even more serious, but there is a solution that suggests itself and which is compatible with what we know about the difficulty of providing a positive definition of adjectives: what we call ‘adjectiviser’ morphology could be, in fact, the spell out of a preposition-like head that adapts the noun into a form that can be used for modification (cf. Mateu 2002). Let us see a bit closer this hypothesis while we present other relevant properties of denominal adjectives.

### 5.1. Relational adjectives

Without doubt, relational adjectives are the class of denominal adjectives that has received the most attention in theoretical studies (Bally 1944; Bolinger 1967; Levi 1978; Ronat 1975; Bartning 1980; Williams 1981; Bosque 1993; Bosque & Picallo 1996; Fradin & Kerleroux 2003; Fábregas 2005, 2007; Marchis 2010, among others). They display some unique properties among adjectives: they are able to denote participants in events denoted by the head noun, and as such they seem to act as noun phrases.

- (37) the **Italian** invasion of Germany  
 ‘the invasion of Germany **by Italy**’

Also, there is evidence that relational adjectives contain an interpretable number feature, unlike other classes of adjectives (Bosque 2006). In the same way that two singular nouns introduced by P can be interpreted as a plurality (‘singular + singular = plural’) (38a), two singular relational adjectives in coordination can modify one single plural head noun (38b); this is not allowed by other classes of adjectives (38c). See Fradin (this volume) for an alternative view.

- (38) a. los embajadores de México y de Guatemala  
 the ambassadors of Mexico and of Guatemala  
 ‘the ambassador of Mexico and the ambassador of Guatemala’  
 b. los embajadores<sup>pl</sup> mexicano<sup>sg</sup> y guatemalteco<sup>sg</sup>  
 the ambassadors Mexican and Guatemalan  
 ‘the Mexican ambassador and the Guatemalan ambassador’  
 c. \*los embajadores<sup>pl</sup> simpático<sup>sg</sup> y antipático<sup>sg</sup>  
 the ambassadors nice and rude  
 Intended: ‘the nice ambassador and the rude ambassador’

The connection of relational adjectives with genitive-marked noun phrases has been pointed out in a variety of works, where it has been suggested that the adjectiviser should be treated rather on a par with case marking (Levi 1974; Ronat 1975; Williams 1981; Bosque 2006; Fábregas 2007). If this proposal is on the right track, relational adjectives would be NP arguments, not really adjectives, and this would not be a real case of adjectival derivation. The results of Sokolova & Edberg (this volume) suggest the alternative that at least some denominal adjectives have such properties, while others are closer to compound-like structures; see also Spencer & Nikolaeva (this volume) for an account where there are degrees of adjectivisation, this time with data from Uralic and Altaic languages.

Many of the properties of relational adjectives would follow from here (see Fábregas 2007). They would contain interpretable number because they would be nouns, not

adjectives; their argument properties would follow from them being nouns, and we would have a plausible explanation of why most relational adjectives have a nominal base. Finally, we could also understand why they produce subordinate structures, as in (39a) (Beard 1991), on the surface a bracketing paradox: if it is treated on a par with (39b), we have a reasonable explanation of why the second relational adjective modifies the first adjective, not the head noun.

- (39) a. un texto latino vulgar  
         a text Latin vulgar  
         ‘a text in Vulgar Latin’ not ‘a vulgar text in Latin’  
       b. un texto en latín del vulgo  
         a text in Latin of-the people

But the facts are more complicated than this suggests. In fact, other classes of adjectives which are not necessarily relational can also be coordinated in the singular to modify a plural noun. This is possible, seemingly, when the adjectives are used to classify subkinds of the entity denoted by the head noun, as in (40a, cf. Bosque 2006), not to describe additional properties of the head noun, as in (40b). In (40a) we talk about two kinds of whale which are considered two different species, but in (40b) we do not talk about two established kinds of table, but about one single kind of object –a table– which can have different colours.

- (40) a. las ballenas blanca y azul  
         the whales white and blue  
         ‘the white whale and the blue whale’  
       b. \*las mesas blanca y azul  
         the tables white and blue  
         Intended: ‘the white table and the blue table’

The crucial factor here seems to be ‘classifying property’ vs. ‘descriptive, additional property’, rather than the inherent relational nature of the adjective.

Moreover, it is unclear that all adjectives that behave like relational adjectives come from nouns, a property that to the best of our knowledge has not been pointed out in the previous literature. Consider (41); the morphological analysis of these adjectives clearly show that a verb, not a noun, is in their base. These adjectives, however, display all the properties of relational adjectives:

- (41) a. legisla-tivo  
         legislate-TIVE  
         ‘legislative’  
       b. ejecu-tivo  
         execute-TIVE  
         ‘executive’  
       c. \*un poder muy ejecutivo  
         a power very executive  
       d. los poderes<sup>pl</sup> ejecutivo<sup>sg</sup> y legislativo<sup>sg</sup>  
         the powers executive and legislative  
       e. una ofensiva legislativa contra Grecia  
         an offensive legislative against Greece  
         ‘an offensive against Greece using laws’

The properties of relational adjectives, then, are still poorly understood, and some of the factors that have been noted in the literature might depend more on their classifying capacity than on their morphological nature.

## 5.2. Other cases

But of course there are other classes of denominal adjectives that do not behave like relational modifiers. The semantic relations that can be expressed through adjectivalisation are varied, and we know of no exhaustive lists of meanings (see Fradin this volume); we can highlight the following:

a) Possession: the head noun is characterised by having something with specific properties or something in a big quantity. Many such adjectives are related to body parts, and in such cases the body part is described in some way, through a modifier (42a) or with a suffix that implies a meaning of abundance (42b); non inalienably possessed nouns are also possible, and in such cases a meaning of abundance is also understood, as in the parasyntetic formation in (42c).

- (42) a. blue-ey(e)-ed  
b. barrig-udo  
belly-UDO  
'with a big belly' (cf. hair-y 'with a lot of hair')  
c. a-diner-ado  
A-money-ADO  
'with a lot of money'

b) Privation: the head noun is characterised as lacking something that otherwise it would have been expected to have.

- (43) pel-ón  
hair-ON  
'without hair'

c) Similarity: the head noun is characterised by sharing some traits or features with the noun in the base of the adjective, such as colour (44a), shape (44b), consistency (44c) or behaviour (44d), among many others.

- (44) a. paj-izo  
straw-IZO  
'as straw, with the colour of straw'  
b. a-campan-ado  
A-bell-ADO  
'in the shape of a bell'  
c. harin-oso  
flour-OSO  
'with the consistency of flour'  
d. child-ish  
'acting like a child'



Note that these relations can typically be glossed also with prepositional phrases: *with N* in the case of possessives, *without N* in the case of privative, *as N* or *like N* for adjectives expressing similarity, etc. But the equivalence with PPs is, of course, not perfect: note that the PP itself is not always gradable when the corresponding adjective is (45). In some cases (46a), the N inside the PP can be quantified, and this seems to correspond to the semantics of the corresponding graded adjective (46b), raising interesting, and difficult, questions about the Lexical Integrity Hypothesis and the linearisation of the structure, if the correspondence noted in (46) is structural and not just semantic.

- (45) a. very child-ish / {\*very / much} like a child  
 b. very pain-less / {\*very / much} without pain
- (46) a. con muchísima barba  
       with much-SUPL beard  
 b. muy barb-udo  
       very beard-ed  
       ‘with a very big beard’

But if the correspondences between PPs and denominal adjectives are not perfect, how should the similarities be understood? Could they derive directly from the syntactic function that they share, as modifiers of nouns? It is clear to us that more detailed work needs to be done in order to identify the range of readings that adjectival formation, in combination with the base noun, can trigger cross-linguistically. This seems to be a prerequisite to the deeper question of how these operations relate to prepositional marking and predicate formation, and ultimately, to the crucial problem of what happens when an adjective is built from a noun.

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