Arguments for the universality of D and determiners
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1. Introduction

The universality of any feature of language is far from being unanimously accepted.[1] The topic of this chapter can therefore only be set in frameworks that assume the presence of at least some universal features across language types, functions or representations. The discussion will be mainly set in the generative tradition, which assumes a universal core and most actively debates on the universality of given features (e.g., definiteness or specificity), their correspondence to syntactic categories (e.g., D, Classifier, or Num), their hierarchical representation, and their dimension of parametrization accounting for language variation and change.[2] For reasons of space, the repertory of languages will be limited to those discussed in the literature chose here as being representative of a research stream. The chapter has no ambition to give an overview of the phenomena related to the D-category in the languages of the World.

The hypothesis of a D projection as part of the nominal expression[3] started in the early '80s, when functional categories were first hypothesized to head autonomous projections. The many proposals arguing in favor or against its universality vary greatly on what is intended with the label D, what features are associated with D, what functions the elements in D have at the interfaces (interpretive or phonological). If we take D to be limited to the surfacing of overt articles, the large number of languages without articles[4] sheds doubt on the universality of DP. Conversely, if we take D (or its specifier) to be the locus of interpretation of the referential index of the whole nominal expression, the universality of DP is straightforwardly supported by two considerations: (i) For all languages, it is legitimate to assume semantic and pragmatic notions of reference and indexicality, such as definiteness, specificity, anaphoricity. (ii) All languages display at least one out of demonstratives, pronouns, numerals or quantifiers.

The chapter is structured as follows. Section 2 presents three seminal works on the "DP-hypothesis", which are often quoted in favor or against the presence of DP in Universal Grammar. Section 3 presents arguments for an enrichment of the featural composition of D. Section 4 presents arguments for the proposal that determiners other than articles, although not merged in D, check their features in D or SpecDP. Section 5 presents arguments from acquisition and change according to which the structural position of D is a precondition for the acquisition and the formation of articles. Section 7 presents two recent accounts that may dissolve some of the objections to the universality of DP.

2. D at the syntax-semantics interface

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[1] A good example of the debate is offered by Evans and Levinson's (2009) article against linguistic universals and the open peer commentaries to it.

[2] An in-depth overview of nominal syntax in the generative perspective is provided by Alexiadou, Haegeman, and Stavrou (2007). Collected volumes addressing the issue of this chapter are Stark, Leiss, and Abraham (2007), Ghomeishi, Paul and Wiltschko (2009), Cabredo Hofherr and Zribi-Hertz (2014), and Armoskaite and Gillon (2015).

[3] "Nominal expression" is a notion that allows us to refer to the whole nominal construct, remaining agnostic as regards the label of the highest projection of the complete nominal constituent, parallel to the notion of "clause". This avoids misinterpretations of the labels NP or DP in this function.

[4] According to Dryer (2013), in a total of 620 languages of the World, only 198 have no definite or indefinite article. It is therefore not true that the majority of languages do not have articles as often stated in the literature (cf. Bauer 2007:104, Lyons 1999:xv). Of the remaining languages, 45 display the indefinite article, 69 have the demonstrative word also used as a marker of definiteness, 216 have an independent word for the definite article, and 92 have an affixal article. This shows that the category D can be realized by different dependent or independent morphemes. The assumption of a zero or a disguised filler of D in the 198 languages lacking articles is not an implausible hypothesis.

D is the first functional category in the nominal domain to which X-bar theory was applied (cf. Szabolcsi 1983/84, 1994, Abney 1987) Following Higginbotham (1985), Stowell (1989), Longobardi (1994) proposes that arguments are universally of category DP because DP is endowed with a [±R]-feature realized according to the language by different fillers of D, obtaining four core interpretations:

(1) a. [$_{DP}$ [$_D$ ɪ] [$_{NP}$ x]]　　　　　　definite descriptions
　　 b. [$_{DP}$ [$_D$ N] [$_{NP}$ ~~N~~]]　　　　　proper names
　　 c. [$_{DP}$ [$_D$ expl] [$_{NP}$ N]]　　　　kind-referring nominals
　　 d. [$_{DP}$ [$_D$ Ǝ] [$_{NP}$ x]]　　　　　weak indefinite nominals

According to Longobardi, NP denotes the kind (Carlson 1977) and provides the range for the operator in D. Definite descriptions have an operator-variable structure (1a), with the ɪ-operator realized by the definite article in languages that have an overt ɪ-operator (e.g. *the girl*). This structure is equivalent to operator-variable structures instantiated by quantifiers also taken to be in D (e.g. *every girl*). Proper names do not have an operator-range structure. Their interpretation of rigid designators (Kripke 1972/1980) is obtained by N-movement to D (1b). In proper names the D-N CHAIN is interpreted in D, in all cases of (2). Parametric variation regards whether movement is overt as in Italian (2a), or covert, as in English (2b). Note that movement can also be covert in Italian (2c), where D is filled by an expletive article which must be deleted and substituted by N at LF:

(2)　　a. [$_{DP}$ Gianni [$_{NP}$ mio ~~Gianni~~]]
　　　　b. [$_{DP}$ ~~John~~ [$_{NP}$ Old John]]
　　　　c. [$_{DP}$ il$_{expl}$ [$_{NP}$ mio Gianni]]

In kind-referring nominals, the D-N CHAIN is interpreted in N. DP is projected, but D is not interpreted in (1c). In Italian, D is filled with another expletive article (3/5a), which in English only appears with singular count nouns (3b), while plural (4b) and mass (5b) nouns do not have an empty D:

(3)　　a.　　*(il) cavallo ha quattro zampe.　　　　(singular count nouns)
　　　　b.　　*(the) horse has four legs.

(4)　　a.　　*(i) cavalli hanno quattro zampe.　　　(plural count nouns)
　　　　b.　　(*the) horses have four legs.

(5)　　a.　　*(il) cavallo è buono da mangiare.　　　(singular mass nouns)
　　　　b.　　(*the) horse is good to eat

Thus, Longobardi is forced to assume three different expletive articles: one to be deleted by N-to-D movement in Italian (2c), one to block N-to-D movement in Italian (3-5a), and one (3b) to avoid ambiguity with mass interpretation in English (5b).

In weak existential nominals (1d), English and Italian allow a covert D with mass singular and plural count nouns (6)-(7), and require an overt indefinite determiner with singular count nouns (8). But Italian also has an overt indefinite determiner for singular mass (6a) and plural count (7a) nouns:

(6)　　a.　　Ho mangiato (delle) mele.
　　　　b.　　I ate apples.

(7)　　a.　　Ho mangiato (della) pasta.
　　　　b.　　I ate pasta.

(8)   a.   Ho mangiato *(una) mela.
       b.   I ate *(an) apple.

Unlike English, Italian requires the null determiner to be in a governed position, like the object position in (6)-(7) and the postverbal subject in (9) and unlike the preverbal subject in (10). Following Delfitto and Schroten's (1991) analysis of bare nouns in Romance and Germanic, the ungrammaticality of (10a) with a null D is reduced by Longobardi to the need for a null D to be lexically governed in Romance but not in Germanic, therefore providing indirect evidence for the projection of D even when D is not filled:

(9)   a.   Sono arrivati (dei) turisti.
       b.   There arrived tourists.

(10)   a.   *(Dei) turisti sono arrivati.
       b.   Tourists arrived.

Despite its popularity among the supporters of the universality of DP, Longobardi (1994) does not provide strong evidence in favour of the universality of DP. The strongest claim is based on the contrast between (6)-(9) and (10). But the Romance/Germanic parameter does not hold. Brazilian Portuguese (cf. Schmitt and Munn (1999), Dobrovie-Sorin (2012) a.o.) is more liberal than English in using bare nouns as kind-referring or indefinite nominals, while German has optional expletive articles in kind-referring nominals (cf. Brugger 1994, Barton, Kolb, Kupisch 2015), thereby being more like Italian. More importantly, Longobardi does not discuss languages without articles.
Adversaries of the universality of DP often refer to Chierchia's (1998) *Nominal Mapping Parameter*, which classifies languages according to two binary features [±pred, ±arg] associated to NP, thereby distinguishing three language-types. (i) Languages with NP specified as [+pred, -arg] always project DP-arguments. This type divides into two subtypes: languages with a null indefinite determiner, such as Italian, and languages with overt indefinite D, such as French, which requires the indefinite determiner *du/des* in the contexts where Italian allows for bare nouns, as (6)-(10). (ii) Languages with NPs specified as [+pred, +arg] have NP-arguments in kind-referring nominals, while indefinite and referential arguments are DPs. This type also divides into two subtypes: languages with overt articles, such as Germanic languages, and languages with non-overt articles, such as most Slavic languages. (iii) Languages with NPs specified as [-pred, +arg] have all argument NPs referring to kind. This has the semantic consequence that all NPs have mass denotation and cannot be plural, as Chierchia claims to be the case of Chinese.
Notably, Chierchia does not propose total absence of DP in articleless languages, but only in languages without the mass/count distinction. Chierchia adopts Longobardi's analysis of proper names as DPs (1b), with N interpreted in D at the latest at LF, not only in [+pred, -arg] languages, but also in those [+pred, +arg] languages in which the NP of proper names is attributed [+pred], such as Germanic and Slavic languages. Chierchia links the mass/count distinction with a typology of the realization of arguments and predicates in syntax. If the count/mass distinction is a specification for the category Num, Chierchia's proposal opens up the possibility to enlarge the inventory of the features related to D (cf. section 2 below).
Cheng and Sybesma (1999), following Doetjes (1997), claim that Chinese languages (Mandarin and Cantonese) semantically differentiate count and mass nouns with different classifiers that fill the head of the functional projection ClP above NP. They further propose the complex functional structure in (11a) with NumP above ClP, to obtain indefinite interpretation, similar to Longobardi's (1d), while definite and generic nominals just have ClP above NP (11b):

(11)   a.   [$_{NumP}$ Num [$_{ClP}$ Cl [$_{NP}$ N]]]   indefinite nominals
       b.   [$_{ClP}$ Cl [$_{NP}$ N]]]   definite or kind referring nominals and proper names

The different interpretations of ClP are obtained assuming that in definite nominals, Cl hosts the ι-operator, parallel to (1a). In kind referring nominals, Cl is empty, parallel to (1c). In proper names, N moves to Cl by substitution, parallel to (1b). Both Num and Cl in (11) can be null, subject to parametrized licensing conditions, like those observed for Romance and Germanic. In object position (12), Mandarin bare nouns can be interpreted as indefinite, definite, or generic. In preverbal subject position (13), they cannot be indefinite but only definite or generic:

(12) a.   Hufei mai shu qu le.
           Hufei buy book go SFP
           'Hufei went to buy a book / books.'
      b.   Hufei he-wan-le tang.
           Hufei drink-finish-LE soup
           'Hufei finished the soup.'
      c.   Wo xihuan gou.
           I like dog
           'I like dogs.'

(13) a.   Gou yao guo malu.
           Dog want cross road
           'The dog wants to cross the road' *not* 'A dog wants to cross the road.'
      b.   Gou jintian tebie tinghua.
           dog today very obedient
           'The dog / dogs was / were very obedient.'
      c.   Gou ai chi rou.
           dog love eat meat
           'Dogs love to eat meat.'

Cheng and Sybesma propose that in Mandarin the null head of NumP needs to be licensed, while ClP is filled by N-to-Cl movement in definite nominals (13b). Kind-referring nominals can have a null, uninterpreted Cl.
Cantonese has the same restriction for indefinite bare nouns (14a) vs. (15a). But the bare noun in preverbal position is ungrammatical (15a) unlike Mandarin (13a), because N does not move to Cl in Cantonese. Thus, definite nominal in Cantonese must have an overt Classifier in both object (14b) and preverbal subject (15b) positions. Only kind-referring nominals can have an uninterpreted null Cl (14c)-(15c):

(14) a.   Wufei heoi maai syu.
           Wufei go buy book
           'Wufei went to buy a book / books.'
      b.   Wufei jam-jyun *(wun) tong la.
           Wufei drink-finish CL soup SFP
           'Wufei finished drinking the soup.'
      c.   Ngo zungji gau.
           I like dog
           'I like dogs.'

(15) a.   *Gau soeng gwo maalou.
           Dog want cross road
           'A dog wants to cross the road.'
      b.   Zek gau gamjat dakbit tengwaa.

CL dog today special obedient
'The dog is especially obedient today.'
c.   Gau zungje sek juk.
dog like eat meat
'Dogs love to eat meat.'

Cheng and Sybesma's underlying assumption is the universality of the division of labour between NP, which describes, and a functional head (Num or Cl), which refers. Languages vary with respect to the functional head(s) that perform(s) the referring function.

3. D a bundle of nominal features

Grimshaw (1991) reverses the notion of "complement" when applied to functional projections and claims that functional structure is an "extended projection" of the lexical head. The sequence P – D – N in nominal expressions is parallel to C – T – V in clauses. Nominal structure projects a lexical layer satisfying the argument structure of N (Grimshaw 1990). It instantiates a predicate-subject dichotomy (Kayne 1994, den Dikken 1998). It projects a hierarchy of adjectival modification (Cinque 1994, 1999). It has a split DP system (Giusti 1996, 2006, Aboh 2004) parallel to the split CP-system (Rizzi 1997). D is sometimes claimed to be parallel to T, as the locus of Agreement with a possessor (cf. Abney 1987, Leu 2008, 2015 Roehrs 2009, among many others) and sometimes parallel to C, as the locus of complementation, extraction from DP, and A'-movement (cf. Horrocks and Stavrou 1987, Szabolcsi 1994, Dimitrova-Vulchanova and Giusti 1998, 1999). In this section, we concentrate on the main features attributed to the upper layer of the nominal spine.

3.1 Case as a feature of D

A Case phrase (KP) above D is proposed by Bittner and Hale (1996) to account for case realizations across many language types: accusative (English, Japanese); accusative active (Acehnese, Eastern Pomo); ergative (Dyirbal, Samoan); ergative active (Baque, Georgian); three-way (Nez Perce, Pitta-Pitta). Bittner and Hale argue for the head property of Case noting that in head-final languages K follows the determiner (16), while in head-initial languages K precedes the determiner (17):

(16)   a.   waitna ba sula ba *ra* kaik-an   Miskitu (Misumalpan: Nicaragua)
Man the] [deer the *ACC*] see-PST.3
'The man saw the deer'
b.   ti   *tõ*   ɛ kuyan tɛ   kupe wã   Shokleng (Gê: Central Brazil)
[he *ERG*] [his body the] wash PRG
'He is washing his body'

(17)   a.   ka la yo ̋ii *ya* ́u khlaa   Khasi (Mon-Khmer: Assam, India)
she PST see [*ACC* the tiger]
b.   ́olo ́o uli   *e*   le teine le ta ́avale   Samoan (Austronesian: Samoa)
PRG drive [*ERG* the girl] [the car]
' The girl is driving the car'

Following Lamontaigne and Travis (1987, 1992), Bittner and Hale consider K parallel to C. Both features depend on an external selector. Both are optional in Japanese when adjacent to the selector:

(18)   a.   Mary-ga John-ni [Koobe-ni iku (*te*)] yuuteta (koto)
M.-TOP J.-DAT [K.-DAT go (that)] said (fact)
b.   Mary-ga [Koobe-ni iku *(te*)] John-ni yuuteta (koto)

'Mary told John that she was going to Koobe

(19) a.   John-ga dare-(*o*)   nagutta no?
           J.-TOP who (*ACC*) hit   Q
     b.   dare-*(*o*) John-ga   nagutta no?
           Who did John hit?

Bittner and Hale propose that in nominative-accusative languages, nominative is lack of Case, and no KP is projected. More recently, Pesetsky (2013) argues for the identity of Nominative Case and D in Russian. Furthermore, since Li and Thompson (1976), functional linguists have noted that subjects tend to be definite.[5] This is evidence in favor of the hypothesis that Case (e.g. nominative) and D-features (e.g. definiteness) are strictly related.

Paul, Cortes and Milambiling (2015), based on Tagalog, argue that languages have KP or DP independently from one another. In Tagalog, *ang* and *ng* are case morphemes, because they turn predicates into arguments, as shown in (20), but they correlate with (in)definite interpretation, as shown in (21).

Both examples in (20) display predicate – subject order. The noun *aso* ('dog') is preceded by *ang* when it is the subject (20a) but not when it is the predicate (20b):

(20) a.   Nag-ingay [ang aso]
           AV-noise ANG dog
           'The dog made noise'
     b.   Aso [ang nag-ingay]
           dog ANG AV-noise
           'The one who made noise was a dog'

In (21) a predicate in actor voice (AV) is contrasted with the same predicate in object voice (OV). *Sa* is a preposition / oblique case marker. The grammatical function correlates with word order and different interpretation for definiteness. In (21a), *ng itlog* is the patient of the AV predicate and it is interpreted as definite. In (21b), *ang itlog* is the patient of the OV predicate and it is interpreted as indefinite:

(21) a.   Nag-abot   ng itlog ang manggagamot sa sundalo
           PRF-AV-hand NG egg ANG doctor SA soldier
           'The physician handed the egg to the soldier'
     b.   Iniabot   ng manggagamot sa sundalo ang itlog
           PRF-OV-hand NG doctor SA soldier ANG egg
           'The physician handed the egg to the soldier'

Tagalog is a good example on how Case and Aspect are related to (in)definiteness. Another case in point is the functionalist account of the accusative/partitive alternations in Finnish, which Huumo (2010) analyses as being the result of nominal aspect.

In a minimalist perspective of economy of feature projection, Giusti (1995, 2001) derives the development of articles in Germanic and Romance languages as the consequence of the loss of inflectional case morphology on N and the realization of (abstract) Case in D. Evidence for this is the residual case morphology on articles (definite and indefinite, free and enclitic) in German and Romanian. More in general, the observation that the majority of the World languages have either case morphology (on nouns, determiner or pronouns) or articles or both is supportive of the proposal that

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[5] I thank an anonymous reviewer for pointing this reference out to me.

D is universal.[6] Note that case is considered a universal category, not only in generative grammar, (cf. Chomsky's (1981) Case theory), but also by structural linguists (Hjelmslev 1935/1972, Tekavčić 1972), and neogrammarians (Paul 1905).[7]

3.2. Num as a feature of D

Ritter (1991) proposes a Num head below D to account for free and construct genitives in Semitic languages. The free prepositional genitive in SpecNP is preceded by N raised to Num in (22a). The construct genitive in SpecNumP is preceded by N (*beyit*) further raised to D in (22b). This accounts for the presence of the article and the full form of N in (22a) and the absence of the article and the reduced form of N (*beit*) in (22b):

(22) a. [DP [D ha] [NumP   [Num beyit] [NP [AP ha-gadol] [NP [PP shel ha-mora] [N ~~beit~~]]]]
           the   house   the-big   of-the-teacher
      b. [DP [D beit] [NumP [DP ha-mora] [Num ~~beit~~] [NP [AP ha-gadol] [NP [DP ~~ha-mora~~] [N ~~beit~~]]]]
           house   the-teacher   the-big
           'the teacher's house'

Construct genitive is present in other unrelated languages, e.g. Irish (Lyons 1999: 131) and Romanian (Dobrovie-Sorin 2000). More generally, many languages with articles have a prenominal genitive in complementary distribution with a determiner and interpreted as a marker of definiteness. Lyons (1999: 130-134) distinguishes DG (determiner genitive) languages, where the presence of a (prenominal) possessor is incompatible with an overt determiner (e.g. English *my home*), from AG (adjunct genitive) languages, where determiners and possessors cooccur (e.g. Italian *la mia casa / la casa mia*). But he observes that many languages are of a mixed type, as Spanish *mi casa* vs. *la casa mia*. These facts show that D is directly related to a head assigning genitive, which may attract the lexical head N (in construct genitives) or remain silent but being interpreted as definite, as in English *a girl next door's bicycle*. If Num is such a head, its presence in languages with and without articles is indirect evidence in favor of the universality of the D + Num sequence.

An example of such argumentation is provided by Langr (2014) and Manlove (2015), who claim that Westgreenlandic Inuit has a DP projection despite absence of articles and presence of Case, because (i) D is needed for possessive agreement, (ii) D is needed for valuation of definiteness, and (iii) SpecDP is a necessary landing site for movement.

Possessor agreement is represented in (23a), where the possessum is plural, but it agrees for the SG-feature of the possessor. Minimally modifying Langr's (2014) and Manlove's (2015) analyses, I suggest that the syncretic inflectional morphemes expressing agreement for the person features of the possessor and the number feature of the possessum suggest that Num is involved in Possessor licensing (assigning ergative case to the possessor D/KP1) and is lower than Case in D/KP2:

(23) a. [Sacajawea-p uqasiq-isa] Naya Nuki aliagi-tsagtitqupa-at
          [S.-SG.ERG   word-3SG.PL.ERG] N. Nuki be.sad.about-IND.TR-3PL.3SG
          'Sacajawea's words made Naya Nuki feel very sad'

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[6] This claim is based on the combination of two WALS features: 49A Number of cases (620 languages, Dryer 2013) and 37A definite articles (261 languages, Iggesen 2013). Out of the 159 languages, considered for both features, only 20 languages (less than 8%) are classified as having no definite or indefinite article and No morphological case-marking. There is no space here to consider each of the 20 languages in turn, but just to note that some of these languages have agreement morphemes that are related to case assignment such as dependent marking and accusative alignment.

[7] An anonymous reviewer notes however that this is not universally true, for example Otto Jespersen denies the presence of case in English. It is however evident that English pronouns do display case morphology. The controversy is therefore a subtler one that regards what is considered case and what is not, in a very parallel fashion as regards what is considered a determiner or a definiteness marker and what is not.

b.　　　　　　　　D/KP2

　　　Spec　　　　　　　　　　　D/K'

　　　　　　　NumP　　　　　　D/K
　　　　　　　　　　　　　　　　ERG
　　D/KP1₃ₚ.ₛG.ₑRG　　　　Num'

　　　　　　　NP　　　　　　Num
　　　　　　　　　　　　　*u*3P.SG [possessor agreement and case assignment]
　　　　　　　N　　　　　　*i*3P.PL

Manlove reports from previous work (Bittner 1987, Fortesque 1984, a.o.) that in the absence of an overt determiner, nominal expressions in West Greenlandic are interpreted as definite or indefinite according to their case (absolutive – definite (24a) vs instrumental – indefinite (24b)) and their position in the clause (postverbal – indefinite (24c) vs unmarked, preverbal – definite or indefinite (24a-b):

(24)　a.　Jaaku-p　　　illu　　　　　　sana-va-a
　　　　　Jacob-SG.ERG house.SG.ABS　　be.building-TR.IND-3SG.3SG
　　　　　'Jacob is/was building the house'
　　　b.　Jaaku　　　　illu　　　　　　sana-va-a
　　　　　Jacob-SG.ABS house.SG.INSTR be.building-TR.IND-3SG.3SG
　　　　　'Jacob is/was building a house'
　　　c.　Taku-lir-pa-ra　　　　　　　iluliar-sua-q
　　　　　see-begin-IND.TR-1SG.3SG　　ice.berg-big-SG.ABS
　　　　　'I spotted a giant ice berg'

Applying Diesing's (1992) notion of restrictive clausure/nuclear scope, Manlove proposes that the DP in (24c) cannot be bound by a specificity / definiteness operator at the left periphery of the clause, unlike the two arguments in (24a-b).

We observe again that argumentation for the existence of a DP in an articleless language involves configurations that are comparable across different phenomena and languages, namely the need to relate the referential properties of an argument to its position in the clause and / or its case.

3.3. Split DP proposals

In the late '90s, the growing inventory of hierarchical features had led Rizzi (1997) to posit "layers" in the structure of the clause, grouping features in larger portions with functions that were originally attributed to a single head.

Zamparelli (1995/2000) initiates a line of research on the "telescopic DP" which has a full realization in Ihsane (2008). According to Zamparelli (1995/2000), the DP is made of three layers corresponding to the referential, predicative and kind interpretation, as in (25), each layer corresponds to a different semantic category. SDP corresponds to strong quantifiers such as *both*, *most*, *every*, and *each*. PDP (predicative determiner phrase) is the projection of weak quantifiers, such as cardinals, *many*, *few*, and *some*, and the indefinite article *a*. KIP refers to kinds, and is above adjectival modification:

(25) [SDP SD [PDP PD [KIP KI [... [NP N]]]]]

Zamparelli's hypothesis differs from both Longobardi's and Chierchia's as regards the interpretive properties of NP; but follows Longobardi's in the assumption that arguments always project SDP. Weak quantifiers and bare plurals in argument positions have a null SD, as in (26b-c):

(26) a. I am looking for $[_{SDP} [_{SD} \text{ every}] [_{PDP} \text{PD}_{[sing]} [_{KIP}... \text{man}]]]$
     b. I am looking for $[_{SDP} [_{SD} 0] [_{PDP} \text{two} [_{KIP}... \text{people}]]]$
     c. I am looking for $[_{SDP} [_{SD} 0] [_{PDP} \text{PD}_{[plural]} [_{KIP}... \text{people}]]]$

The appeal of (25) is that it creates a direct syntax–semantics mapping of well-known properties of quantifiers, which are assumed to be universal. Quantifiers that can only have strong reading are directly inserted in SD, ambiguous quantifiers are inserted in PD, where they get a weak reading, but can be moved to SDP to obtain a strong reading. Zamparelli also suggests a correspondence with pronominal forms in Italian: the indefinite pronoun *ne* corresponds to KIP, the uninflected pronoun *lo*, corresponds to PDP and the inflected personal pronouns, which display accusative case and gender and number distinctions correspond to SDP.

Guillemin (2015) elaborates on Zamparelli's system and argues that SDP in Mauritian Creole is further split into SpP [±spec] and DefP [±def]. Definite and indefinite articles express specificity and not definiteness. In [+def; +spec] expressions, *la* is merged in Sp and triggers movement of a definite DefP to SpecSpP, as in (27a). In [-def; +spec] expressions, the same movement takes place in (27c). Since Sp is null, there is no overt evidence for such a movement in specific indefinites, which are only superficially identical to non-specific indefinites (27b):

(27) a. Li 'nn kass $[_{SpP} [_{DefP} \text{gro mang ver}] \text{la} [_{DefP} \text{~~gro mang ver~~}]]$
         3SG ASP pick   big mango green SP
         'S/he has picked the big green mango.'
     b. Fred ule manz $[_{SpP} 0 [_{DefP} \text{enn mang mir}]]$. Li pu rod **enn** lor pye
         Fred want eat   a mango ripe   3SG MOD look.for **one** on tree.'
         Fred wants to eat a ripe mango**.** He will look for **one** on the tree.
     c. Fred ule manz $[_{SpP} [_{DefP} \text{enn mang mir}] 0 [_{DefP} \text{~~enn mang mir~~}]]$ Li 'nn truv **lij** lor pye
         Fred want eat   a mango ripe   3SG MOD see **it** on tree.'
         'Fred wants to eat [a ripe mango]. He saw it on the tree.'

Accounts of "double definiteness" in Scandinavian independently propose a split DP. In Scandinavian, when the lexical head N is unmodified, the article is enclitic and no double definiteness occurs (28a). When an adjective is inserted, the three logical possibilities are found. Only an initial free morpheme appears in Danish (28b), only the enclitic article appears in Icelandic (28c), both the free and the suffixal morphemes appear in Swedish and Norwegian (28d). Delsing (1988, 1993), Giusti (1994) take the enclitic article to be agreement on N. Julien (2002, 2005) proposes that D is split into [±definite] and [±specific]:

(28) a. huset / húsið
         house-the
     b. det store hus(*et)   Danish
     c.   stóra húsið   Icelandic
     d. det store hus*(et)   Norwegian /Swedish
         the old house(-the)

Giusti (1996, 2006) proposes that D can be split in two heads: Case (parallel to Rizzi's (1997) Force) and Num (parallel to Rizzi's (1997) Fin) sandwiching discourse features, such as contrastive topic (Kon) in Albanian. In (29a) the contrasted topical adjective is immediately below the demonstrative

in (Case) and above the ordinal adjective "other", which is postnominal in this language, because N moves very high. The unmarked order is given in (29b):

(29) a. [CaseP kyo [KonP [AP2 shumë e bukur(a)] Kon [NumP [Num+N vajzë] [FP1 [AP1 tjetër] [N vajzë]
          this   very the nice(the)   girl   other
          [FP2 [AP2 shumë e bukur(a)] [N vajzë] [NP [N vajzë]]]]]]]
          "this other VERY NICE girl"
     b. [CaseP kyo [NumP [Num+N vajzë][FP1 [AP1 tjetër] [N vajzë] [FP2 [AP2 shumë e bukur] [N vajzë]
           this   girl   other   very nice
          [NP vajzë]]]]]]]
           "this other very nice girl"

A split DP with a Left Periphery (LP) is claimed by Giusti and Iovino (2014, 2016) for Latin, an articleless language, to account for marked orders inside the nominal expression, as in (30a), where the adjective *magnam* precedes the demonstrative, and for discontinuous nominal expressions as in (30b), where the possessor *cuius rei* (of such thing) is discontinuous with the wh-modifier *cuius* moved to the clause initial position leaving the head *rei* in the basic position preceding the noun *sapor* and following the determiner *illum*. This is possible because both the DP possessor and the DP possessee have an LP:

(30) a. [LP magnam [DP illam [NP magnam laetitiam]]]
          great.ACC.F.SG that.ACC.F.SG   happiness.ACC.F.SG
          'that great happiness' (Cic. fam. 7,2,2)
     b. Cuius [LP cuius [DP illum [NP [LP cuius rei]   sapor]]]   excitet.
          whose.GEN.F.SG   that.ACC.M.SG   thing.GEN.F.SG taste.NOM.M.SG excites
          'Whose taste excites him.' (Sen. *epist*. 5,47,8)

Note that extraction of a genitive possessor is possible in many article languages, thereby counterarguing the proposal that it is the lack of DP that permits extraction in articleless languages, as Greek and Hungarian (cf. Alexiadou, Haegeman and Stavrou 2007: 576):

(31) a. Tinos   mu   ipes   pos   dhiavases [tinos to vivlio]?
          who-GEN   me-GEN   say-2SG.PAST that   read-2SG.PAST.the book
          'Whose book did you tell me that you read?' (Horrocks and Stavrou 1987)
     b. Ki-nek   ismer-té-tek   [DP kinnek a vendég-é-t].
          who-DAT   know-PST-2PL   the gurst-POSS.3SG-ACC
          'Whose guest did you know?' (Gavrouseva 2000)

3.4. Summary
The universality of DP is supported independently of the presence of an article in a language, if
  (i)   D realizes (abstract) case;
  (ii)   D interacts with Num or Cl in the interpretation of the nominal expression;
  (iii) D interacts with an immediately lower head licensing a possessor;
  (iv)   D does not only host definiteness but also specificity features;
  (v)   a split DP includes discourse features such as Topic or Focus that allow for
         displacements of adjectives and possessives;
  (vi)   SpecDP is the escape hatch for extraction from the nominal expression.

The six properties above are widespread across languages especially if covert forms of case, number and classifiers are taken to be present in the syntax. Properties (v) and (vi) derive free orders from

richer structure, thereby arguing for the configurationality of free order languages, often missing articles.

If the presence of one of the above properties is sufficient evidence for the presence of D in a language, the unmarked hypothesis is that D is universal. The burden of the argumentation is turned to the supporters of the non-universality, who would have to show that there are languages without any of the properties above.

4. Determiners across categories

The claim of the lack of D in articleless languages goes along with the claim that in these languages any other determiner is an adjective and correlates with the claim that in languages with articles all determiners are in D. Bošković (2005) derives the contrast between Serbo-Croatian *moja* and English *my* with this type of argumentation. In (32), *moja* which cooccurs with a demonstrative and can function as a predicate. In (33) *my* has neither possibility:

(32)   a.   ova moja knjiga
       b.   Ova knjiga je moja.

(33)   a.   (*this) my book
       b.   This book is *my / mine.

Bošković's correlation between lack/presence of article and adjectival/determiner nature of possessives does not hold, in either way. Italian has both adnominal and predicate adjectival possessive adjectives (34), German only has the predicate adjectival possessive (35), Abruzzese (an Italo-Romance variety, Cuonzo 2018) only has the adnominal adjectival possessive (36):

(34)   a.   questo mio libro
       b.   Questo libro è (il) mio.

(35)   a.   *(dieses) mein Buch
       b.   Dieses Buch ist mein / das meine.

(36)   a.   'ssu/lu libbrə mé
          this/the book my
       b.   'Ssu libbrə iè *mé / lu mé.
          this book is my / the my

Bošković's correlation also proves wrong in articleless languages, as argued by Pereltsvaig (2007) for Russian, Giusti and Iovino (2016) for Latin, Norris (2017) for Estonian, Kornfilt (2017) for Turkish.

A second case in point is the syntax of demonstratives. Unlike possessors, their referential index is the referential index of the nominal expression. They are therefore the best candidates to fill the DP projection and, being universally present across languages (Diessel 2006), they are the best empirical evidence to support the universality of DP. Much work in generative grammar analyzes demonstratives as complex constituents first merged in lower positions but always interpreted in DP, independently of whether they are overtly or covertly remerged in D (cf. Brugé 1996, 2002; Bernstein (1997, 2001); Giusti (1997, 2002, 2018); Leu (2008, 2015)).

The same arguments made for possessives thus hold for demonstratives, they are not fillers of D but interact with the bundle of features in D, notably including case. Pereltsvaig (2007) notes for Russian that possessives and demonstratives have inflectional paradigms different from adjectives and similar to pronominal forms. This also holds of Latin, Romanian, and German (Giusti 2015),

The last case in point is the behavior of pronouns as determiners, first pointed out by Postal (1969). Progovac (1998) shows that personal pronouns and proper names minimally differ in Serbo-Croatian when modified by the adjective *samu* in (37)-(38). The contrast is taken as evidence for a N-to-D movement of the pronoun in (37) but not of the proper name in (38):

(37)   a.   ?*I samu nju/mene to nervira.
             and only her/me that irritates
       b.   I nju/mene samu to nervira.
             'That irritates even me'

(38)   a.   I samu Mariju to nervira.
             and only Mary that irritates
       b.   ?* I Marije samu to nervira.
             'That irritates even Mary'

Progovac further shows that Serbo-Croatian pronouns have the same Case inflection of so-called 'long adjectives' that are merged to convey definite reading (39a), while short form adjectives convey indefinite reading (39b) and are the only forms used in predicate function (39c):

(39)   a.   Nedostaje mi plav-i kaput.
             misses me-dat blu-def coat
             'I'm missing the blue coat.'
       b.   Nedostaje mi plav kaput.
             misses me-dat blu coat
             'I'm missing a blue coat.'
       c.   Ovaj kaput je plav /* plavi.
             'That coat is blue.'

This draws a correlation between pronouns and long adjectives as denoting referentiality and distinguishes them from short adjectives as denoting properties.

Personal pronouns are claimed to be universally of category DP by Cardinaletti and Starke (1999), who propose that pronouns differ according to the richness of their internal structure: strong pronouns have the full internal spine DP > NumP > DP, weak pronouns are DP > NumP, clitic pronouns are bare DP with no internal structure. This proposal unifies the properties of pronouns with other argument DPs. Lyons (1999: 310-320) independently proposes that pronouns carrying person features are intrinsically definite and therefore of category DP across languages, while languages may vary with respect to the presence or absence of definiteness (taken to reside in D).

Other accounts go in the opposite direction, proposing that weaker pronouns lack the upper part of the structure. Person features are decomposed by Harley and Ritter (2002), who claim that third person pronouns are less structured than first or second person. This is however tangential to the issue of the universality of DP across languages, as first and second person are generally present across languages. Déchaine and Wiltschko (2002), and Cowper and Hall (2007, 2009), decompose pronouns in different hierarchically structured features, that may each be the highest in different functions in different language, e.g. English, French, Halkomelem, Suswap and Japanese.

Although these accounts explicitly suggest the non-universality of DP as a label in the projection of pronouns, they are compatible with the hypothesis of a universal D understood at the locus of the syntactic projection and semantic interpretation of features such as reference, person, number, and the morpho-phonological representation of case in argument nominal expressions.

5. Evidence from language acquisition and change

The delayed appearance of articles and auxiliaries in child speech has led some linguists to propose the Maturation Hypothesis, or Lexical Learning Hypothesis, according to which the initial grammar only contains lexical categories (cf. Radford 1988, Platzack 1990, Guilfoyle and Noonan 1992). Radford (1990) claims that early child English has no DP because it lacks determiners, genitive markers, prepositions, and personal pronouns and does not display binding theory effects. Being DP the locus of referentiality, the latter property is taken to prove that children do not have DPs. He reports that in languages with case, child speech lacks case morphology (cf. Rom and Dgani (1985) for Hebrew, Clahsen (1984) for German, Ito (1988) for Japanese), confirming that case and D are strictly related.

The Maturation Hypothesis is not *per se* against the universality of DP, as it can be complemented by the hypothesis that all languages eventually develop a DP. However, the alternative Full Competence Hypothesis, which assumes an innate DP, is a stronger argument in favor of the universality of DP.

Against the Lexical Learning Hypothesis (cf. Braine 1963, Tomasello 1992), in favor of the Full Competence Hypothesis, Valian (2009) claims that innate competence of functional heads at the very initial stage enables the child to segment the input in words and to associate such words to lexical categories. Since nouns are the first words to be acquired, if D is the cue to individuate N, D must be present at the very initial stage. This is supported by many inferences grounded on experimental data on 2-year-old or younger children.

In spontaneous speech, errors regarding determiners are limited to omissions and do not regard mistaken categorization or syntactic construction. Valian (1986) shows that children as young as 2-year old discriminate adjectives from determiners in that they do not produce ungrammatical sequences of adjective > determiner (e.g. *green the truck) or of two determiners (e.g. *the my truck or *the the truck), while they do produce grammatical sequences of two adjectives (e.g. *the tiny little truck, the green green green truck*).

In elicited imitation tests 2-year-olds are more likely to repeat an English noun if it is preceded by an English determiner than if it is preceded by a non-sense word with the same prosodic characteristics (Gerken, Landau and Remez 1990). Not only is comprehension of nouns facilitated at very early stages if the noun is preceded by a determiner, but children are also sensitive to determiner types. Shi, Cutler, Weker, and Cruickshank (2006) show that 8-month-old children distinguish the high frequency determiner *the* from the low frequency determiner *her*, using *the* but not *her* to segment nonsense nouns. Furthermore, at this age, a nonsense determiner such as *kuh* gives the same effect as high frequency *the* and a nonsense determiner such as *ler* gives the same effect as low frequency *her*. This shows that at 8 months the closed class of D-fillers is open to acquisition. This is not the case at 11 months, when only *the* can isolate new nonsense words.

Supporters of the Full Competence approach further note that article omissions are less frequent than a maturational approach predicts. Furthermore, they can be motivated by the maturation of other modules interacting with syntax at the interfaces, such as phonology (cf. Gerken (1994) on English, Demuth (1992) on Sesotho, Bohnacker (1997) on Swedish, Giusti and Gozzi (2006) on Italian) or pragmatics (cf. Armon-Lotem and Avram (2005) on Hebrew, Giusti (2012) on Italian).

In generative grammar, language change is directly related to language acquisition (Roberts and Roussou 2003:13). If syntactic changes are the result of a change in parameter setting (Lightfoot 1979), it is natural to assume that this occurs at some point in a given generation of learners. Chomsky (1995) argues that parameters are associated to different specification of functional heads. Therefore, if language acquisition shows that infants at their very first stage do have the functional category D, as suggested in the previous section, the emergence of articles is only made possible in learners that can associate a given lexical item to the independently present DP structure. This is necessary in the hypothesis that grammaticalization is reanalysis from Spec to Head status (cf. Giusti 1995, 2001, van

Gelderen 2004; 2011:197-244) or that it is reanalysis from movement (to Spec or Head) to first merge (cf. Roberts and Roussou 2003:132-136).

In typological literature, definite articles are unanimously taken as the result of grammaticalization of demonstratives or pronouns (cf. Greenberg 1978, Himmelmann 2001, Wiltschko 2014). The underlying assumption is that under the pressure of some independent change in the system, the highest functional head could remain silent at an earlier stage and be realized by obligatory insertion of a semantically weakened demonstrative at a later stage. Among the possible triggers, the following have been proposed: (i) weakening or disappearance of case morphology on N related or unrelated to loss of N-to-D movement (Giusti 1995, 2001, Dimitrova-Vulchanova and Vulchanov 2010); (ii) change in the aspectual system (Abraham 1997, Leiss 2000); (iii) reorganization of the determiner system (Lyons 1999, Bauer 2007); (iv) change in number or gender agreement inside the nominal expression (Bartra-Kaufmann 2007, Stark 2007, Mathieu 2009).

If nominal expressions are universally of category D, the grammaticalization of Dem into D is easily accounted for by the hypothesis that demonstratives (that are first merged in lower positions and move to SpecDP) are reanalyzed as fillers of D. But, if articleless did not have a DP layer, it would have to be assumed that the DP structure maturates from the emergence of a category that is not yet present in the input. According to Bauer (2007), such a hypothesis would be reasonable in contact induced change. A language with no DP could develop one in contact with a language with a well-developed DP. What is found in diachronic data is instead a very slow process of development, which can display considerable oscillations. The definite article developed in many Indo-European languages in quite comparable ways, with long lasting processes, oscillations, and clear interaction with other changes. This leads Bauer to propose that the concept of definiteness already existed in Indo-European and that the change mostly regarded the form with which it came to be expressed.

6. Possible unifications

The discussion so far has highlighted the large consensus among generative grammarians on the universal presence of functional structure. The disagreement regards the number and label of the functional projections. This may be viewed from two opposite approaches. Cartography seeks to find the universal feature hierarchy of functional heads (cf. Cinque and Rizzi 2008). Minimalism eliminates labels, freely produces right- or left-branching configurations, and merges all and only the items that are necessary, already bundled with valued and unvalued features.

Attempting to unify the two methodologies, Giusti (2015) proposes that heads are hierarchically organized bundles of interpretable and uninterpretable, valued and unvalued features. Low-level parameters regarding lexical items specify how the features should be realized (as one or more words). The head of an "extended projection" is remerged as many time as necessary to saturate all its open positions (argument structure) and to come in due relation with all its modifiers. The remerger of the head subdues to the hierarchy of the features of the head, which are satisfied one at a time, from the most internal to the most external. At the end of the process, the syntactic object must contain a referential index, which refers to an individual (cf. Arsenijević 2007, 2015).

In this approach, D is just an old way to call the highest segment of N, bundled with all its features, including the open position to be saturated by an individual index (Higginbotham 1985). As with regular arguments, the merger of the referential index, e.g. the silent iota-operator ιOp (Campbell 1996), minimally composed of Person features is satisfied in two steps. A first merge in the lower / earlier part of the projection, which saturates an open position <E>, and a later agreement step of a probe $u\varphi$ targeting the Person features of the index (cf. Giusti 2018). The agreement triggers movement of the Person feature to the highest specifier in the nominal projection. A simple definite expression made of a lexical head and a referential index will have the representation in (40):

(40) $[_{NP2}\,\iota Op\,[_{N2}\,N+Gen+Num+\bcancel{u}\phi+u K]\,[_{NP1}\,\bcancel{\iota Op}*\,[_{N1}\,N<E*>+Gen+Num+\;u\phi+u K]]]]]$

N1 and N2 are two identical segments of the same head. For a general principle of Economy, languages do not realize identical segments more than once (cf. Nunes 2004). Parametric variation regards which segment is realized (thereby deriving head movement effects). The bundle may be realized in more than one segment, provided the two segments are morphologically different and the linearization does not violate the universal feature hierarchy. Languages with articles realize the highest segment of N, which must crucially include uK (Case) to be valued through external syntax. A different unification proposal is provided by Witschko's (2014) formal typology of functional structure. Witschko argues for a universal spine applying to all lexical categories made of the following four areas: linking > anchoring > point-of-view > classification. According to Witschko, the units of language (UoL) associate with the spine and acquire the properties of the area they associate with. In this perspective, nominal anchoring regards the semantic notion of "identity" and therefore covers determiners, pronouns as well as the formal notion of abstract Case. Witschko then claims that even if no individual feature can be argued to be universal, we should not conclude that there is no universal base for natural language categorization. The assumption of no universal base, in fact, cannot explain many tendencies that occur in unrelated languages, such as the internal structure of pronouns, the grammaticalization processes, and the relation of case, definiteness, specificity, and number noted in this chapter.

To conclude, if D is taken to be the cover term for referentiality (interpretation of an individual index) and argumenthood (receiving θ-role and Case), it has very strong possibilities to be universal, any different conception of D to different nuances of interpretation will make its universality more debatable.

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