DIFFERENTIAL OBJECT MARKING: ICONICITY VS. ECONOMY[*]

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Abstract

A formal approach to the typology of DIFFERENTIAL OBJECT MARKING (DOM) is developed within the framework of Optimality Theory. The functional/typological literature has established that variation in DOM is structured by the dimensions of animacy and definiteness, with degree of prominence on these dimensions directly correlated with the likelihood of overt case-marking. In the present analysis, the degree to which DOM penetrates the class of objects reflects the tension between two types of principles. One involves iconicity: the more marked a direct object *qua* object, the more likely it is to be overtly case-marked. The other is a principle of economy: avoid case-marking. The tension between the two principles is resolved differently in different languages, as determined by language-particular ranking of the corresponding constraints. Constraints expressing object markedness are derived through HARMONC ALIGNMENT of prominence scales. Harmonic alignment predicts a corresponding phenomenon of DIFFERENTIAL SUBJECT MARKING. This too exists, though in a less articulated form.

1.   Differential Object Marking

It is common for languages with overt case-marking of direct objects to mark some objects, but not others, depending on semantic and pragmatic features of the object. Following Bossong (1985), I call this phenomenon DIFFERENTIAL OBJECT MARKING (DOM). DOM takes many forms, including the three listed in (1):

(1) a. Sinhalese, in which case-marking is optional, but only animate-referring objects may be case-marked (Gair 1970);
    b. Hebrew, in which object case-marking is obligatory but is limited to definite objects (Givón 1978);
    c. Romanian, in which object case-marking is obligatory for some objects, optional for others, and excluded for a third set. Those for which it is obligatory are animate-referring personal pronouns and proper nouns (Farkas 1978).

Although these three examples may seem quite disparate, DOM is in fact a highly principled phenomenon. Bossong (1985, VIII) observed [my translation]:

(2)   The structural uniformity of this phenomenon in at least 300 (presently known) languages around the earth is so obvious that one wonders why linguistics has up to now dealt so little with this topic.

        The general understanding of DOM which has emerged from the *functional/typological* literature can be characterized as in (3):[1]

(3)   The higher in prominence a direct object, the more likely it is to be overtly case-marked.

The dimensions along which prominence is assessed include, and are perhaps limited to, animacy and definiteness.[2, 3]

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[1] Especially important are Comrie (1979; 1980; 1986; 1989), Croft (1988), Lazard (1982; 1984), Bossong (1985), and Silverstein (1976; 1981).

[2] Person and topicality are also relevant dimensions. The distinction between the local persons (1st and 2nd) and the 3rd can be articulated at the top end of the definiteness scale in (4b). Person-driven case is extensively discussed in Silverstein (1976), Blake (1977), DeLancey (1981), Comrie (1989, 128), and Dixon (1994). An analysis of such cases in terms like those of this paper is given in Aissen (1999). Topicality is also relevant, particularly within domains where case marking is 'optional' (cf. fn. 24). Its role is not formally integrated into the present analysis.

[3] In some languages, aspect plays a role in the way objects are case-marked, e.g. in the choice between partitive and accusative case in Finnish (see Kiparksy (1998) and references therein). Although properties of the object bear on the choice of case in

(4) a. Animacy scale: Human > Animate > Inanimate
     b. Definiteness scale: Personal pronoun > Proper name > Definite NP >
         Indefinite specific NP > Non-specific NP

The relation between (3) and (4) is this: if in some language a direct object at some rank can be case-marked, then higher-ranked direct objects in that language can be case-marked, but not necessarily lower ranked ones. Returning to our initial examples: in Sinhalese, only objects high in prominence on the animacy hierarchy are case-marked; in Hebrew, only objects high in prominence on the definiteness hierarchy are case-marked; and in Romanian, it is objects which are high in prominence on both hierarchies that must be case-marked.

Within this general conception of DOM, there is still substantial room for language-particular variation. First of all, although DOM is very common, there are languages which mark *all* direct objects; in these cases, object marking is not *differential*. Second, even among those that do have DOM, languages differ according to which dimensions are relevant. This is clear from our initial examples. And finally, even when DOM is determined in two languages by the same dimension, languages vary with respect to the 'cut-off' point. Turkish, for example, like Hebrew, has DOM determined by the definiteness hierarchy. But while DOM distinguishes definites from indefinites in Hebrew, it distinguishes specifics from non-specifics in Turkish (Enç 1991). The challenge then is to develop a theory of DOM which expresses the generalization in (3), and at the same time allows for the various ways in which DOM can be implemented in particular languages.

An intuition which recurs in the literature on DOM is that it is those direct objects which are most in need of being distinguished from subjects that get overtly case-marked. This intuition is sometimes expressed as the idea that the function of DOM is to disambiguate subject from object. There may be cases in which DOM is motivated precisely by the need to disambiguate, but it is also clear that DOM is required in many instances where the absence of case-marking could not possibly lead to ambiguity. In a weaker form, the intuition can be understood in the following terms: the high prominence which motivates DOM for objects is exactly the prominence which is unmarked for subjects. Thus, it is those direct objects which most resemble typical subjects that get overtly case-marked. Because of the association of subjects with agenthood on the one hand, and topicality on the other, animacy and definiteness are unmarked properties for subjects (Keenan 1976). But they are not unmarked properties for objects. In fact, they

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Finnish, Kiparsky (p. 270) shows that the relevant dimension is not definiteness of the object, but aspect (what he terms 'boundedness'). (Furthermore, in contrast to the phenomenon discussed here, the choice in Finnish is between two overt case forms, not between ø and overt case.) I assume here that it is possible to distinguish DOM determined by the animacy/definiteness of the object from DOM determined by aspect, and try to deal only with the former. Assessing the relative contribution of each factor in systems where both are implicated (e.g. perhaps in Spanish, (Kliffer 1982; Torrego 1998) is an important task, made more complicated by the fact that aspect sometimes determines the definiteness or specificity of the object.

seem to be marked properties for objects, in part perhaps because of the pressure to maximally differentiate subject and object. Thus, exactly what is marked for objects is unmarked for subjects, and vice versa -- an instance of what has been termed *markedness reversal* (Battistella 1990; Croft 1990; 1996). Comrie (1979, p.19) puts it this way:

> ...in natural languages, certain grammatical relations tend to be characterized by certain features, in particular [that] subjects tend to be definite, animate, and topic (thematic); while direct objects tend to be indefinite, inanimate, and rhematic.

In later work, Comrie suggests that there is a relation between markedness reversal and markedness of structure ("A" and "P" refer to subject and object of transitive verb, respectively):

> ...the most natural kind of transitive construction is one where the A is high in animacy and definiteness, and the P is lower in animacy and definiteness; and any deviation from this pattern leads to a more marked construction. (Comrie 1989, p. 128)

This suggests a conception of DOM which is fundamentally iconic: nominals which are marked *qua* objects are morphologically more complex than ones which are unmarked *qua* objects.[4] Functionally, the overt marking of atypical objects facilitates comprehension where it is most needed, but not elsewhere. DOM systems are thus relatively economical.

  Given a characterization of the relevant prominence scales, (3) makes clear cross-linguistic predictions. If any inanimate objects are case-marked in a language with DOM, then at least some animate objects will be case-marked; if any indefinite objects are case-marked, then at least some definite objects will be marked, etc. We can think of this in terms of frequency: if there are differences in the *frequency* of overt marking among objects of different types, (3) predicts that those of higher prominence will be marked more often than those of lower prominence. This covers a wide range of cases, since objects at a particular rank may be obligatorily case-marked, optionally case-marked, or never case-marked. The boundaries which separate the obligatorily case-marked objects from those which are optionally case-marked or never case-marked may shift, but the resulting systems are apparently always consistent with (3) (Bossong 1985, p. 8). Also consistent with (3) are systems in which frequency of marking within the optional range

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[4]Hopper and Thompson (1980) suggest a different interpretation of DOM, one which is also iconic (see also Magier (1987)). In their account, DOM registers a high degree of clausal transitivity on one of the arguments of the clause. Various factors contribute to degree of transitivity, but one of them is individuation of the object. High rank on the prominence scales of (4) corresponds to a high degree of individuation. This account and the one proposed here (which is based conceptually on the approaches cited in the text) will lead to similar predictions about DOM, but they are conceptualized quite differently. The Hopper and Thompson approach is not related to markedness reversal and therefore does not, as far as I can tell, make predictions about discriminate *subject* marking systems (see section 6 below).

varies according to the prominence of the object. Given the difficulty of discovering absolute linguistic universals, this is quite remarkable, and cannot be attributed to the accident of a small number of languages with DOM. DOM is extremely widespread, found within the Indo-European family (especially in Indo-Iranian and Romance), in Pama-Nyungan, in Dravidian, Uralic, Afro-Asiatic, and elsewhere.

Within generative grammar there have recently been very interesting discussions of the relation between DOM and the interpretation of indefinites as specific or non-specific (Enç 1991; Diesing 1992; Dobrovie-Sorin 1994; de Hoop 1996; Torrego 1998). But these discussions do not extend to the broader view of DOM which has come out of functionalist and typological work, one which includes not only the way DOM distinguishes specific from non-specific indefinites, but also the way it distinguishes pronouns from non-pronouns (in some languages), humans from non-humans (in others), definites from indefinites (in yet others), and complex combinations of these.[5]

A stumbling block to a formal generative treatment of DOM is the need to refer to prominence scales. These have never been formally integrated into generative syntax, and as a consequence generalizations which depend on them cannot be fully integrated. The fact that DOM is characterized in many languages by a great deal of apparent fuzziness has perhaps reenforced the feeling that the principles underlying DOM are not part of core grammar. However, the exclusion of DOM from core grammar comes at a high cost, since it means that there is no account forthcoming from formal linguistics for what appears to be an excellent candidate for a linguistic universal.

Optimality Theory (OT) provides a way, I believe, to reconcile the underlying impulse of generative grammar to model syntax in a precise and rigorous fashion with a conception of DOM which is based on prominence scales. The purpose of the present paper is to develop an approach to this phenomenon within OT which is formal *and* at the same time expresses the functional-typological understanding of DOM. Furthermore, it does so in a way which relates DOM to markedness reversal and iconicity. Central to the analysis are constraint subhierarchies which are constructed from prominence scales like those in (4). The ranking of constraints in these subhierarchies is universally fixed, and it is this property which allows the implicational universal in (3) to be derived. At the same time, these constraints are violable, which predicts the range of observed language-particular difference.

2.   Harmonic Alignment and Markedness Reversal

If markedness reversal lies at the heart of DOM, then the ideal situation would be one in which markedness reversal somehow entered into the formal account of DOM. It is quite unclear how this could be achieved in current conceptions of generative syntax. But developments in OT *phonology*, some general, and some quite specific, provide the conceptual and technical tools to build such an account. The essential conceptual innovation is the idea that constraints are universal but violable. The essential technical

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[5] An exception is Williams (1997), which takes a broader view of DOM, one which is also based on iconicity (the association between marked expression and marked content).

tool is HARMONIC ALIGNMENT, a formal operation for deriving constraints which express markedness reversal.[6]

2.1   Harmonic Alignment

The OT account of DOM requires, first of all, constraints which characterize the relative markedness of various associations of grammatical function with animacy and definiteness. Harmonic alignment provides the right kinds of constraints (Prince and Smolensky 1993, Ch. 8). Harmonic alignment operates on pairs of scales, aligning each element on one with each element on the other, and it generates constraint subhierarchies which express the relative markedness of each such association. Harmonic alignment is proposed in Prince and Smolensky as part of their account of the relation between sonority and syllable structure. The sonority hierarchy and the various prominence scales relevant to DOM belong to distinct 'interface' systems (the acoustic/articulatory system, the system of meaning), but the structural roles that these scales play in language design are strikingly parallel. The formal operation of harmonic alignment provides the means to express this parallelism between phonology and syntax.

     The treatment of sonority and syllable structure in Prince and Smolensky is based on the idea that there are two kinds of structural positions in the syllable, the Peak and the Margin (Margin subsumes Onset and Coda), and that the unmarked situation is for the Peak to be filled by a relatively sonorous element, ideally a vowel, and the Margin by a relatively less sonorous one, ideally an obstruent. This is an instance of markedness reversal in the domain of phonology.

     Harmonic alignment operates on two scales, one of which must be binary.[7] It associates the high-ranking element on the binary scale with each of the elements on the other scale, left to right (i.e. high to low). It associates the low-ranking element on the binary scale with each of the elements on the other scale, right to left.[8] Applied to the

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[6] Recent work in OT morphology and syntax has appealed to harmonic alignment in accounts of differential effects in a number of domains: voice and subject choice (Aissen 1997, 1999; Bresnan et al. 2001; Dingare 2001; Mikkelsen 2002); word order (Lee 2001; Gutiérrez-Bravo 2002), the syntax of pronouns (Müller 2002), nominal-internal structure (Aissen 1997; O'Connor 1999; Anttila and Fong 2002), the distribution of null pronouns (Artstein 1999), agreement (Morimoto 2002), and case (Stiebels 2000a, b; Asudeh 2001; Sharma 2001; Ortmann 2002; Lee 2001, 2002, to appear).

[7] Alignment. Suppose given a binary dimension D_1 with a scale $X > Y$ on its elements $\{X, Y\}$, and another dimension D_2 with a scale $a > b ... > z$ on its elements. The *harmonic alignment* of D_1 and D_2 is the pair of Harmony scales:

$\quad\quad H_X : X/a \succ X/b \succ ... \succ X/z$

$\quad\quad H_y: Y/z \succ ... \succ Y/b \succ Y/a$

The *constraint alignment* is the pair of constraint hierarchies:

$\quad\quad C_X: *X/z \gg ... \gg *X/b \gg *X/a$

$\quad\quad C_y : *Y/a \gg *Y/b \gg ... \gg *Y/z \quad\quad\quad$ [Prince and Smolensky 1993, p. 136]

[8] One scale must be binary to uniquely determine the direction of alignment and to derive plausible universal predictions. Suppose that D_1 in the definition of fn. 7 were instead trinary, with a scale $X > Y > Z$ on its elements. X would align from left to right with the

scale on syllable position (5) and the scale on sonority (6), it yields the two markedness hierarchies in (7) (where "x >y" means "x is more prominent than y", and "x ≻ y" means "x is less marked than/more harmonic than y"):

(5)   Peak > Margin
(6)   Vowel > Sonorant > Obstruent

(7)   a.   Peak/Vowel ≻ Peak/Sonorant ≻ Peak/Obstruent
        b.   Margin/Obstruent ≻ Margin/Sonorant ≻ Margin/Vowel

According to (7a), vowels are the least marked type of peak, and obstruents are the most marked type; according to (7b), obstruents are the least marked type of margin, while vowels are the most marked. Harmonic alignment provides then for the formal representation of markedness reversal.

The hierarchies in (7) express important markedness relations underlying syllable structure. A compelling feature of OT is that these hierarchies can be interpreted as constraint hierarchies and thereby constitute the substance from which grammars are constructed. Constraint hierarchies are derived from (7a,b) by inverting their ordering, and interpreting the ranked elements as avoid constraints:

(8)   a.   *MARGIN/VOWEL » ... » *MARGIN/OBSTRUENT
        b.   *PEAK/OBSTRUENT » ... » *PEAK/VOWEL

The high-ranking constraints in (8a,b) penalize vowel margins and obstruent peaks, respectively. Crucially, (8a,b), and more generally, constraint hierarchies derived by harmonic alignment, are universal subhierarchies. Their rankings are fixed, and thus cannot be the locus of language-particular difference. In the case of syllable structure, the fixed rankings in (8a) and (8b) express the linguistic universals underlying the distribution of sonority in the syllable.

2.2   Harmonic Alignment and DOM
Harmonic alignment can likewise be used to characterize the linguistic universals which underlie DOM. In the domain of DOM, the scales which are aligned are the scale on grammatical functions (the *relational scale)* and the scales on animacy and definiteness.

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elements of D_2, Z would align from right to left. But what would determine the direction in which Y aligns? The direction of alignment could be fixed by definition (say, left to right), but this would weaken the account, since Y would then be treated exactly like X and the theory would predict no typological asymmetries between X and Y with respect to association with the properties on D_2. This is presumably undesirable, if the reasons for assuming a trinary scale, X > Y > Z, were valid in the first place. Note that a structural n-ary scale can be reduced to a set of binary scales, each of which can function as D_1 under harmonic alignment, as defined in fn. 7.

2.2.1 Animacy

Animacy plays a significant role in DOM. Following a great deal of work in diverse grammatical traditions, I assume the relational scale in (9), as well as the animacy scale from (4a), repeated below as (10):

(9)   Relational Scale: Su(bject) > Object (Oj)
(10)   Animacy Scale: Hum(an) > Anim(ate) > Inan(imate) (Croft 1988)

Harmonic alignment of grammatical function with animacy yields two hierarchies, one on subjects and one on objects; each expresses the relative markedness of possible associations with the various degrees of animacy.

(11)   a.   Su/Hum $\succ$ Su/Anim $\succ$ Su/Inan
       b.   Oj/Inan $\succ$ Oj/Anim $\succ$ Oj/Hum

The scale on subjects, (11a), says that human subjects are less marked than animate ones, which are in turn less marked than inanimate ones; the scale on objects, (11b), says the reverse. Again, these markedness hierarchies can be implemented as constraint hierarchies by reversing their rankings and interpreting the elements as avoid constraints:

(12)   a.   *SU/INAN » *SU/ANIM » *SU/HUM
       b.   *OJ/HUM » *OJ/ANIM » *OJ/INAN

According to these hierarchies, if any clauses are to be avoided because of the animacy of the subject and/or object, it will be clauses with inanimate subjects and/or human objects.

The constraint subhierarchies in (12a,b) will form the basis for the key constraints in our account of animacy-sensitive DOM, but it is important to recognize that they are independently motivated. The high-ranking constraint in (12a) is relevant in languages like Jakaltek (Craig 1977) and Halkomelem (Gerdts 1988b), which exclude inanimate subjects (in transitive clauses) altogether. These constraints are also relevant in languages like Tzotzil and Chamorro which exclude transitive clauses in which the subject is 3rd person inanimate and the object is 3rd person human (see discussion and references in Aissen (1997)).

2.2.2 Definiteness

In many languages DOM is determined entirely, or in part, by the dimension of definiteness. The Definiteness Scale, repeated below as (13), extends the familiar hierarchy on definiteness (definite > specific > non-specific) to proper names and pronouns. The short form of the hierarchy is assumed in some discussions of DOM (Comrie 1986; Croft 1988). The motivation for extending it comes from DOM itself: while it is necessary to distinguish pronouns and proper names from other definites, they are treated as the high end of the same scale. Thus, while there are languages which case-mark only personal pronoun objects, or only pronoun and proper names objects, or pronoun, proper name and definite objects, there appear to be none which case-mark just definites, excluding personal pronouns and proper names. I assume then that the

Definiteness Scale has the form in (13), with abbreviations for each element indicated underneath (note that indefinite specifics are referred to as *Spec*):

(13)   Definiteness Scale:
        Pronoun > Name > Definite > Indefinite Specific > NonSpecific
        Pro >   PN >   Def >   Spec >   NSpec

If this scale is to be part of a cross-linguistically valid approach to DOM, it is necessary that the elements which it orders be defined in a way independent of language-particular morphosyntax. Following ideas and suggestions of Farkas (1997) I suggest that the relevant scale has to do with the 'extent to which the value assigned to the discourse referent introduced by the noun phrase is fixed'.[9] In the case of 1st and 2nd person pronouns, the value is fixed by the speech situation. That of 3rd person is limited to a salient non-participant. In the case of proper names, the value is fixed by convention. In the case of definite descriptions, the hearer is not free to assign just any value to the discourse referent introduced by the noun phrase. Definites are subject to a familiarity requirement, meaning that the value is determined by previous discourse. Indefinites are subject instead to a novelty requirement, but the degree to which the value assigned to the discourse referent is fixed or free can vary. It is more fixed in the case of partitives like 'two of the girls', where the value must be chosen from a familiar set, than it is in the case of 'free choice' *any* (e.g. 'you can bring any friend'). It is also relatively fixed when used in combination with 'certain', (e.g. 'you should bring a certain friend'). 'certain' suggests that the choice of value is restricted to someone the speaker has in mind or someone who stands in a particular relation that the speaker has in mind. The restriction is often present in the form of a modifier (e.g. ...a certain friend who understands you').

The degree of freedom available in fixing the value of the discourse referent introduced by an indefinite indeed appears to be highly relevant in determining DOM for indefinites. Enç (1991) identifies two types of indefinites which carry the accusative suffix in Turkish: one is partitives like 'two of the girls'; the other is indefinites which translate 'a certain N'. She characterizes these as *specific* indefinites. In a discussion of DOM in Persian, Lazard identifies exactly these two classes of indefinites as the ones which obligatorily take the object suffix -*râ* (Lazard 1982). I will assume here that the class of specific indefinites includes these two types.

Harmonic alignment between the relational scale and the definiteness scale produces two markedness hierarchies, one on subjects and one on objects:

(14)   a.   Su/Pro ≻ Su/PN ≻ Su/Def ≻ Su/Spec ≻ Su/NSpec
        b.   Oj/NSpec ≻ Oj/Spec ≻ Oj/Def ≻ Oj/PN ≻ Oj/Pro

According to (14a), personal pronouns are the least marked type of subject, and non-specific indefinites are the most marked. This is reversed for objects, (14b): personal pronouns are the most marked type of object, and non-specific indefinites, the least

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[9] For a scale with similar form, which is motivated on different grounds, see Davison (1984). The givenness hierarchy of Gundel et al. (1993) might also provide the basis for definiteness-based differential case marking.

marked. From these markedness hierarchies, the constraint subhierarchies in (15) are derived, again by inverting the ranking and interpreting the elements as avoid constraints:

(15) a.   *Su/NSpec » *Su/Spec » *Su/Def » *Su/PN » *Su/Pro
      b.   *Oj/Pro » *Oj/PN » *Oj/Def » *Oj/Spec » *Oj/NSpec

The constraints in (15a,b) will form the basis for our account of DOM which is entirely, or in part, determined by definiteness. Like the constraints on subject and object animacy in (12a,b), those in (15a,b) are independently motivated.

        The two high-ranking constraints in (15a) penalize indefinite subjects, non-specific and specific, respectively. It is known that there are languages which exclude non-specific indefinite subjects, in compliance with the highest constraint in (15a). Diesing and Jelinek (1995) observe that Egyptian Arabic excludes indefinites in subject position ([Spec, IP]) unless they are interpreted partitively. Tagalog likewise has a well-known preference for definite subjects (Foley and Van Valin 1984; Kroeger 1993). It excludes indefinite non-specific subjects, per (15a), but apparently allows indefinites when specific (Kroeger, p. 15). There may be languages which exclude both specific and nonspecific indefinite subjects. Givón (1978, 295) claims that exclusion of indefinite subjects is a categorical constraint in most languages and a generalization which holds at the level of the text-count in others. He cites Bemba as a particular example. Keenan (1976) cites Malagasy. Neither source distinguishes specific from non-specific indefinites. The top constraints in (15a) may also be relevant in languages like Hindi where there is no definite article, and where the default interpretation for subjects (but not objects) is as definite (Singh 1994).

        The high-ranking constraint in (15b) penalizes personal pronoun objects. It is relevant in languages like Chamorro (Chung 1984, 1998), Mam (England 1983) and Halkomelem (Gerdts 1988a), all of which exclude transitive clauses in which the object is a 3rd person personal pronoun and the subject is a non-pronoun. All these languages resort to constructions other than simple transitive clauses to express the combination of non-pronoun agent and pronoun patient. The top three constraints in (15b) penalize definite objects of various types, and might be relevant in a language like Tagalog, where definite patients cannot be realized as objects, but must be subjects (Foley and Van Valin 1984; Kroeger 1993).

3.   Iconicity and Economy

The subhierarchies derived in the previous section penalize marked associations more forcefully than unmarked ones. Thus, high-ranking constraints from those subhierarchies will be relevant in languages where transitive clauses involving marked associations are avoided. However, DOM arises precisely when these marked associations are *not* avoided. Such associations are tolerated, presumably because of higher-ranked constraints that penalize clauses in which the patient is not realized as object (cf. (Aissen 1999)). In these cases, the marked transitive association is tolerated but the object is morphologically marked. Hence, what is needed at this point are constraints which characterize the relation between morphological complexity and markedness.

In thinking about how this should be implemented, it is important to focus on the morphology of DOM. In principle, there are various ways in which a language could morphologically distinguish between high- and low-prominence objects. It could mark the low-prominence ones and leave the high-prominence ones unmarked; or it could mark both, but with different morphemes. But this is not the way DOM works. *Overwhelmingly*, DOM is implemented by overtly marking the marked class of objects, and leaving the unmarked ones with no morphological mark (Bossong 1985, 125). Thus, Spanish examples like *Veo la casa* "I see the house" vs. *Veo a la mujer* "I see the woman", are typical: the low prominence (inanimate) object is unmarked (and thus identical to the subject form), while the high-prominence (human) object must be marked.

The morphology of DOM then is *privative*: zero expression contrasts with audible expression.[10] We can understand this opposition in a principled way by assuming that audible expression of case must involve a positive specification for morphological case, while zero expression need not, and often does not. More specifically, I assume that the representation of nominal arguments may include a value for the feature CASE, e.g. ACCUSATIVE, GENITIVE, DATIVE. Such specification will normally have an audible exponent. But CASE may also be left with no value, in which case there can be no audible exponent. We want then to penalize the absence of case specification most forcefully for high prominence objects. Following a suggestion of Paul Smolensky's (5/97, p.c.), I propose that the absence of case specification is penalized by the constraint in (16), $*\emptyset_C$ (read: *Star Zero)*, subscripted with *C* for CASE (see Aissen (1999)).

(16) $*\emptyset_C$ 'STAR ZERO': Penalizes the absence of a value for the feature CASE.

This constraint does not directly force audible case, but since morphological case generally has an audible exponent, it enforces it indirectly.[11]

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[10] In a number of the languages discussed below, accusative case in a DOM system is identical to dative case, e.g. Spanish, Hindi, Catalan, Yiddish. According to Bossong (1991), dative case is by far the most common source for accusative in DOM systems. Two factors favor this pathway. First, direct and indirect objects are structurally similar in being non-subject arguments (Harris and Campbell 1995). Second, indirect objects are overwhelmingly human (or animate) and definite, exactly the properties which favor DOM for direct objects. Historically, dative provides the accusative marker both for DOM systems which are primarily based on animacy (e.g. Spanish) and for ones primarily based on definiteness (e.g. various Semitic languages, also Persian, though the original dative has in many cases been replaced by other forms (Bossong, p. 157)). Other sources for accusative in DOM systems include "locatives, especially directionals, …also ablatives and existentials (presentatives)" (Bossong 1991, fn. 42). Languages in which the dative is *not* the source of accusative DOM include Romanian, Hebrew, and Turkish.
[11] Following most work in OT syntax, I assume that inputs are semantic forms or argument structures, and contain no specification of syntactic function or morphological case. The latter are added by GEN, and are thus properties of candidates (Legendre et al. 1993; Grimshaw 1997; Bresnan 2000). Enforcing the presence of morphological case cannot then fall to constraints on input-output faithfulness.

Finally we want to compel case specification (henceforth: case-marking) on the most marked objects most forcefully. Since we already have constraints which characterize the relative markedness of objects, namely the subhierarchies in (12) and (15), the question is how to link *ø$_C$ to those hierarchies. One possibility is LOCAL CONSTRAINT CONJUNCTION (Smolensky 1995).[12] If we assume that local conjunction of *ø$_C$ with the constraint subhierarchies in (12) and (15) preserves the ranking of those subhierarchies, then this operation yields new subhierarchies which characterize the relative markedness of zero case-marking for objects of different types (see Aissen (1999)). Local constraint conjunction yields the subhierarchies shown in Figure 1, arranged vertically for the sake of clarity.

Local conjunction of *ø$_C$ with the subhierarchy on object animacy (12b)	Local conjunction of *ø$_C$ with the subhierarchy on object definiteness (15b)
*OJ/HUM & *ø$_C$ » *OJ/ANIM & *ø$_C$ » *OJ/INAN & *ø$_C$	*OJ/PRO & *ø$_C$ » *OJ/PN & *ø$_C$ » *OJ/DEF & *ø$_C$ » *OJ/SPEC & *ø$_C$ » *OJ/NSPEC & *ø$_C$

Figure 1: Local conjunction of *ø$_C$ with object-oriented subhierarchies

The high-ranking constraint of the left-hand subhierarchy penalizes the absence of case on human-referring objects. Hence, in a DOM system based on animacy, if there are *any* objects that are case-marked, that set will include human objects. Likewise, the high-ranking constraint on the right penalizes the absence of case on object personal pronouns, guaranteeing that if any objects are case-marked in a definiteness-based DOM system, personal pronouns will be. The effect of local conjunction here is to link markedness of content (expressed by the markedness subhierarchies) to markedness of expression (expressed by STAR ZERO). That content and expression are linked in this way is a fundamental idea of markedness theory (Jakobson 1939; Greenberg 1966). In the domain of DOM, this is expressed formally through the constraints in Figure 1. Thus they are ICONICITY CONSTRAINTS: they favor morphological marks for marked configurations.

---

[12] The local conjunction of C$_1$ and C$_2$ in domain D, C$_1$ &$_D$ C$_2$, is violated when there is some domain of type D in which both C$_1$ and C$_2$ are violated (Smolensky 1995). For the constraints of Figure 1 (below), the relevant domain is the nominal constituent itself. It should be acknowledged that constraint conjunction is a powerful operation which, if unrestricted, will generate constraints that are clearly undesirable. For example, if the subhierarchies of (12b) and (15b) were conjoined with *STRUC$_C$, rather than with *ø$_C$, all the predictions made by the present analysis would be neutralized. One possibility is to appeal to functional reasoning (cf. Aissen 1999): although constraints formed by conjunction of the subhierarchies with *STRUC$_C$ might exist, grammars in which they were active would be highly dysfunctional since marking would be enforced most strenuously exactly where it is least needed. The bidirectional, "evolutionary" OT approach of Jäger (2002) may explain more precisely why such grammars are dysfunctional and unstable.

If we say nothing more, the subhierarchies of Figure 1 will force case on *all* objects. Since this is precisely what does *not* happen in DOM systems, some constraint must penalize case. I assume that the relevant constraint is an ECONOMY condition, a version of *STRUC which penalizes the specification of morphological CASE.

(17)   *STRUC$_C$: penalizes a value for the morphological category CASE

*STRUC$_C$ can be interpolated at any point in the subhierarchies in Figure 1, 'turning off' case-marking of all object types mentioned in the dominated constraints. However, there is no way that a less prominent object can be case-marked if more prominent ones are not case-marked. Hence, it is the interaction of the constraint hierarchies in Figure 1 with *STRUC$_C$ that constitutes the core of this account. It is this interaction which expresses the generalization in (3): *The higher in prominence a direct object, the more likely it is to be overtly case-marked.*[13]

From this perspective, DOM involves the tension between iconicity and economy, a tension which has been extensively discussed in connection with other domains in morphosyntax in (Haiman 1985a, b). Iconicity favors the morphological marking of syntactically marked configurations; economy penalizes it. The tension between these two principles is resolved in particular languages through constraint ranking. Section 4 surveys the extent to which the factorial typology defined by the interaction of the constraints in Figure 1 with *STRUC$_C$ is in fact realized. In section 5, I turn to systems in which animacy and definiteness combine to determine DOM.

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[13] Under this analysis, the presence/absence of overt case is determined solely by properties of the object. There are suggestions in the DOM literature that the predicate itself may sometimes play a role, either through its entailments or as a lexical idiosyncrasy. A role for entailment is suggested in Mohanan (1994a) which states that "the choice between ACC and NOM [i.e. overt case marking vs. no overt case marking, JA] is available only to the objects of those verbs that are neutral to the animacy of their objects. Thus, in contrast to the verb *u_t^haa* 'lift', the verb *lik^h* 'write' can only take inanimate objects, and does not allow ACC objects even when they are definite…Similarly, the verb *piit* 'beat' (more accurately, 'spank') requires animate objects, and does not allow NOM objects" [p. 81]. The observation is contradicted by various examples cited in other works. E.g. Singh (1994, 226) cites an example where *maar* 'kill' takes an object *without* overt case; Harley (1944, 33) cites one where *lik^h* 'write' takes a definite inanimate object *with* overt case. Mohanan (1993), which was written after Mohanan (1994), explicitly denies that verb meaning plays a role in DOM (p. 24). Browning and Karimi (1994) treat some verbs as lexically idiosyncratic with respect to DOM in that they require the marked form of the object, and disallow the unmarked form. Their example is *busidan* 'kill'. It is not clear from their examples, all of which have human objects, that it is exceptional, since human objects in Persian almost invariably take object marking, regardless of definiteness (see §5.3 below). (Browning and Karimi do not acknowledge a role for animacy in their description.) The possibility that the predicate itself might play a role in DOM does not seem at all outlandish, but exactly what that role might be remains to be clarified.

4.   One-Dimensional DOM

The points of possible interpolation of *STRUC$_C$ into the subhierarchies of Figure 1 define the set of possible DOM systems based on one dimension: animacy or definiteness. Here, I consider the extent to which this typology is instantiated by known languages, starting with definiteness.

4.1   Definiteness

Figure 2 shows the points where *STRUC$_C$ can be interpolated among the subhierarchy on object definiteness (Figure 1, right-hand side), and cites one language for each of the possible DOM types.

← *STRUC$_C$ [Kalkatungu, no objects case-marked]

*OJ/PRO & *Ø$_C$

| ← *STRUC$_C$ [Catalan, only pronoun objects case-marked]

*OJ/PN & *Ø$_C$

| ← *STRUC$_C$ [Pitjantjatjara, only pronoun and PN objects case-marked]

*OJ/DEF & *Ø$_C$

| ← *STRUC$_C$ [Hebrew, only pronoun, PN, and def. objects case-marked]

*OJ/SPEC & *Ø$_C$

| ← *STRUC$_C$ [Turkish, all objects case-marked except non-specifics]

*OJ/NSPEC & *Ø$_C$

← *STRUC$_C$ [Written Japanese, all objects case-marked]

Figure 2: Interpolation of *STRUC$_C$ in the subhierarchy on object definiteness

If *STRUC$_C$ dominates all the constraints on object definiteness, then case-marking is penalized for all objects. An example is a language like Kalkatungu (Pama-Nyungan), in which no objects at all are case-marked (Blake 1979). Kalkutungu is a language with ergative case-marking in which *all* transitive subjects are case-marked, but no objects or intransitive subjects. Examples (18a,b) show zero marking of the object and overt case-marking of the subject (throughout, direct objects are italicized; note also that retroflex consonants are represented by underscoring).

(18)   a.   Ma_rapai-t̲u caa *kunka* t̲umaji-n̲a.
               woman-ERG here stick   break-PAST
               The woman broke the stick.   (Blake 1979, p. 27)

       b.   ŋa-t̲u n̲an̲a *ma_rapai*...
               I-ERG   saw   woman
               I saw the woman.   (Blake 1979, p. 28)

Even very high prominence objects like the 1st person pronoun are unmarked in object function, as shown in (19) (compare with the case-marking for the 1st person subject in (18b)).

(19)   Ḷi-ji kuu-ŋku *ŋai* ŋaṉṯamaji ṯiinta
        3s-ERG rain-ERG me find   in.the.middle
        The rain caught me in the open.   (Blake 1979, p. 32)

The pronominal form *ŋai* is the citation form, as well as the form used in object and intransitive subject function. Thus I assume it has no specification for case.

    If *STRUC$_C$ is ranked one step lower, below the top-ranked constraint, it penalizes case-marking on all objects except personal pronouns. An example is Catalan, where (strong) personal pronouns must be preceded by *a*.[14,15] (Here and below, I gloss the morphology associated with DOM by *ACC*.)

(20)   a.   No   m'havien   vist *a   mi*.
                 NEG CL they.have seen ACC 1SG
                They had not seen me.   (Comrie 1979, p. 15)
        b.   Él te   telefoneará *a   ti*.
                he CL will.phone   ACC 2SG
                He'll phone you.   (Rigau 1986, p. 161)
        c.   *A   ell   no   el   vull*.
                ACC 3SG.MASC   NEG CL I.want
                Him, I don't want.   (Vallduví 1992, p. 76)

The 3rd person pronoun in (20c) requires *a* even when it occurs postverbally. Other definite objects, including proper names and definite human common noun phrases, are not preceded by *a* (whether preposed or not):

_____

[14]Thanks to Louise McNally, Josep Fontana, and Nuria Silleras for discussion of the Catalan examples. Comrie (1979) cites Catalan as a language in which DOM is driven by person (1st and 2nd versus 3rd). But examples like (20c), and the contrast with (22), show that the split is between personal pronouns (of all three persons) and all other nominals. The facts reported here correspond to those of prescriptive grammar. In the spoken language of at least some speakers, *a* is more widespread.
[15]Examples (20a-c) all contain an obligatory clitic pronoun, which doubles the strong pronominal object. This raises the possibility that it is the obligatory presence of the clitic which motivates the presence of *a* before the strong pronouns. But this cannot be all that is involved. In the left-detachment construction illustrated by (20c) and (22), a clitic always resumes a left-detached direct object. If the detached object is a strong pronoun, as in (20c), it must be preceded by *a;* if it is a non-pronoun, as in (22), *a* does not occur. Thus, while it is true that a strong pronoun object always induces an object clitic (and *a*), it is not true that a clitic always induces *a*.

(21) No havien   vist   *l'alcalde.*
      NEG they.have seen the mayor
      They had not seen the mayor.   (Comrie 1979, p. 15)

(22) ...docs *el Joan* el veiem   ben poc.
         since the John CL we.see very little
      …since John we see very little of.   (Vallduví 1992, p. 90)

Demotion of the economy condition *STRUC$_C$ below *OJ/PN & *ø$_C$ penalizes case-marking of all objects other than personal pronouns and proper names, for which case-marking is forced by higher ranked constraints. Pitjantjatjara, a Pama-Nyungan language of Australia, exemplifies this case (Bowe 1990). In Pitjantjatjara, pronouns and proper name objects are case-marked with the suffix *–nya*:[16]

(23) Tjitji-ngku *Billy-nya/ngayu-nya* nya-ngu.
      child-ERG   Billy-ACC/1SG-ACC   see-PAST
      The child saw Billy/me.

Other objects, including definite, human-referring ones, are not case-marked.

(24) a.   Billy-lu *tjitji* nya-ngu.
            Billy-ERG child see-PAST
            Billy saw the child.
      b.   Ngayulunatju *punu* kati-ngu.
            1STSG.NOM.REFL wood bring-PAST
            I brought the wood all by myself.

Further demotion of *STRUC$_C$ below *OJ/DEF & *ø$_C$ describes a language in which pronouns, proper names, and definite objects are overtly case-marked, but indefinites are not. Hebrew is such a language (Givón 1978). In Hebrew, the preposition *'et* is obligatory with definite objects, including inanimates, and does not occur with indefinites.[17,18]

(25) a.   Ha-seret her'a *'et-ha-milxama.*
            the-movie showed ACC-the-war
            The movie showed the war.
      b.   Ha-seret her'a *(*'et-) milxama.*
            the movie showed (ACC-)war
            The movie showed a war.

---

[16] Bowe glosses the case marker on the object *ABS* (for absolutive). I am systematically using *ACC* for this function.

[17] Thanks to Edit Doron for these examples.

[18] There is one exception to this which involves the dimension of animacy. The interrogative pronoun "who" is obligatorily case-marked with '*et*. The inanimate interrogative is not marked; neither are the pronouns "someone" and "noone". Yehuda Falk and Hagit Borer each brought this to my attention.

Example (25a) is ungrammatical without *'et*, while (25b) is ungrammatical with it. That the relevant property is definiteness rather than specificity is shown by the fact that (26b) disallows *'et* even though the object refers to a specific doctor.[19]

(26) a.   Hu mexapes *'et-ha-rofe*.
              he is.looking ACC-the-doctor
              He's looking for the doctor.
      b.   Hu mexapes *(*'et) rofe 'exad*.
              he is.looking (ACC) doctor one
              He's looking for a certain doctor.

Turkish is like Hebrew in that all definite objects are obligatorily case-marked, whether they are personal pronouns, proper names, or definite common nouns, and irrespective of animacy:

(27) a.   Zeynep *Ali-yi   /on-u   /adam-ɨ /o masa-yɨ*   gördü.
              Zeynep Ali-ACC/him-ACC/man-ACC/that table-ACC saw
              Zeynep saw Ali/him/the man/that table.
      b.   *Zeynep *Ali / o / adam / o masa* gördü.   (Enç 1991)

Turkish differs from Hebrew, though, in that some indefinites are case-marked. Enç (1991) characterizes this class as *specific*. Notably, the class includes partitive indefinites. Thus, the sentence *Several children entered my room* can be followed by (28), in which the object may be case-marked or not.

(28) Iki *kɨz /kɨz-ɨ*   tanɨyordum. (Enç 1991, ex.17, 18)
      two girl/girl-ACC I.knew
      I knew two girls.

The version with the case marker is 'about two girls who are included in the set of children, established by the [previous, JA] utterance… the version without 'is about two girls who are excluded from the original set of children' [Enç 1991, p. 6]. The class of specifics also includes cases in which the speaker has a specific referent in mind. Enç cites the examples in (29a,b), with the translations indicated:

(29) a.   Ali *bir kitab-ɨ*   aldɨ.   (Enç 1991, ex. 14)
              Ali one book-ACC bought
              A book is such that Ali bought it.
      b.   Ali *bir kitap* aldɨ.   (Enç 1991, ex. 15)
              Ali one book bought
              Ali bought some book or other.

---

[19] Specificity is marked by *'exad*, the "gender inflected numeral 'one'" (Givón 1978, p. 303). This element is not limited to objects.

The difference between Turkish and Hebrew can be characterized by the ranking of
*STRUC$_C$ relative to *OJ/SPEC & *Ø$_C$. In Hebrew, *STRUC$_C$ is ranked above it, favoring
economy, i.e. no case-marking on specific indefinites; in Turkish, it is ranked below it,
favoring iconicity, i.e. case-marking on specific indefinites.

  At this point, it might be helpful to show some tableaux which illustrate this
analysis. The tableaux in (30)-(31) contrast the treatment of indefinite, specific direct
objects in Hebrew and Turkish. The input is the same in both cases: the nominal is
specified for semantic role (ARG) and degree of definiteness (DEF). Here, I consider only
those candidates in which the grammatical function (GF) of the nominal is direct object
(OJ), and the top three constraints on object definiteness are encapsulated and represented
by *OJ/DEF & *Ø$_C$. In each case, there are two candidates, one with a value for CASE
specified (as *ACC)* and one with no value specified. In both cases, the top three constraints
are irrelevant. In Hebrew, *STRUC$_C$ eliminates the candidate specified for CASE, leaving
the unspecified candidate as winner.

(30)

ARG: PATIENT DEF: SPECIFIC, INDEFINITE	*OJ/DEF & *Ø$_C$	*STRUC$_C$	*OJ/SPEC & *Ø$_C$	*OJ/NSPEC & *Ø$_C$
GF: OJ DEF: SPECIFIC, INDEFINITE CASE: ACC		*!		
☞ GF: OJ DEF: SPECIFIC, INDEFINITE CASE:			*	

Tableau 1: Hebrew

In Turkish, the candidate with no value specified for CASE is eliminated by *OJ/SPEC &
*Ø$_C$, leaving the candidate specified for CASE as winner (see (31)). The winner violates
the economy condition *STRUC$_C$ but this violation is necessary in order to ensure
compliance with *OJ/SPEC & *Ø$_C$, a higher ranked constraint.

(31)

ARG: PATIENT DEF: SPECIFIC, INDEFINITE	*OJ/DEF & *Ø$_C$	*OJ/SPEC & *Ø$_C$	*STRUC$_C$	*OJ/NSPEC & *Ø$_C$
☞ GF: OJ DEF: SPECIFIC, INDEFINITE CASE: ACC			*	
GF: OJ DEF: SPECIFIC, INDEFINITE CASE:		*!		

Tableau 2: Turkish

  Finally, ranking *STRUC$_C$ below the full subhierarchy yields a language with non-

differential object marking, one in which all objects are overtly case-marked. Written Japanese is apparently such a language, as is Dhalandji (Australia) (Austin 1981). Example (32), from Dhalandji, shows overt case-marking for both primary and secondary object, one high in prominence (the personal pronoun), the other low in prominence (indefinite, probably non-specific) (PURP.DS = purposive, different subject):

(32)　　…wantha-rrpuka *ngatha-nha　papa-nha.*
　　　　give-PURP.DS　me-ACC　　water-ACC
　　　[I am waiting for the whiteman] to give me water.　(Austin 1981, p. 223)

　　　This account predicts then that if a language case marks any objects, it will case-mark definite ones. A language may mark specific objects, and leave non-specific ones unmarked. But no language will case-mark specific indefinites, but not definites. These predictions appear to be borne out.[20]

4.2　　Animacy
Interpolation of *STRUC$_C$ into the subhierarchy on object animacy (Figure 1, left-hand side) predicts two types of languages with animacy-sensitive DOM: languages in which only objects referring to humans are case-marked, and languages in which only objects referring to animates (including humans) are case-marked. As noted at the outset, there are languages in which only animate-referring direct objects can be overtly case-marked. Sinhalese is an example, though in Sinhalese, case-marking is optional. It is difficult, however, to find languages in which all and only human-referring objects are case-marked. The reason is that in individual languages, animacy-sensitive DOM frequently extends beyond, or retracts within, the human category. Interestingly, it does so in ways that are clearly culturally determined.
　　　In Yiddish, DOM is restricted to humans, but does not cover the entire category. Among common nouns, overt case-marking is restricted to eight common nouns, most of which denote individuals worthy of respect. This set contains three masculine nouns which are obligatorily case-marked (*tate* "father", *zeyde* "grandfather" and *rebe* "teacher"), two masculines which are optionally case-marked (*Yid* "Jew" and *mentsh*

---

[20] An anonymous reviewer asks whether Inuit is a counterexample to the claims made here about DOM. In Inuit, narrow scope (often non-specific) objects are morphologically marked, while wide scope (specific) objects are unmarked (exactly what the relevant distinction is is not settled; I will refer to it here as specificity). This would be a counterexample if nominals of both types are indeed objects. However, it has often been proposed for Inuit that in clauses with specific patients, the patient is the most prominent argument in the clause -- depending on one's analytical assumptions, the subject, the pivot, or the occupant of [Spec, IP] ((Bok-Bennema 1991; Johns 1992; Bittner 1994; Manning 1996)). This realization of a specific patient as subject rather than object would be accounted for in my terms if the constraint penalizing specific objects (*OJ/SPEC) was ranked high enough to bleed DOM. As for the morphologically marked non-specifics, these have been analyzed as simple accusative marked objects (Bok-Bennema 1991) and also as obliques in an antipassive construction. See Manning (1996) and references therein.

"person") and three feminine nouns, which are optionally case-marked (*mame* "mother", *bobe* "grandmother", *mume* "aunt").[21] In both Ritharngu and Hindi, DOM leaks across the human-animate boundary, but in different ways. In Ritharngu, all human-referring direct objects are case-marked but so are a few nouns referring to 'higher animals' like kangaroos, dogs, and emus. In contrast, nouns referring to fish and raccoons are not case-marked in object function (Heath 1980). In Hindi, DOM likewise extends beyond the human-animate boundary, but according to Mohanan (1993, 28), the higher animals include elephants and lions, and exclude peacocks and mice. Leakage across the animate-inanimate boundary is also found. In Bayungo, all animate direct objects (including humans) are overtly case-marked, but so are two inanimate nouns, *murla* 'meat' and *thanuwa* 'vegetable food' (Austin 1981).

There are two ways to analyze these cases. It might be that the three basic categories HUMAN, ANIMATE, and INANIMATE are understood differently in particular languages. Or it might be that they are understood in basically the same way, but that there is further language-particular ranking within the basic categories. On this view, DOM would make the cut somewhere within the basic category, rather than at its boundary. I assume this is the case. First of all, it seems unlikely that speakers of any language do not distinguish between humans and animals. Second, there is a parallel within the category of PERSON. While all languages apparently rank the local persons (1st and 2nd) over 3rd, languages vary in ranking of the local persons themselves. In some languages, 1st person outranks 2nd; in others, 2nd outranks 1st. Language-particular articulation within the category of LOCAL PERSON must then be permitted, and this constitutes a precedent for permitting language-particular ranking within the categories of HUMAN, ANIMATE, and INANIMATE.

Figure 3 then represents this conception. Interpolation of $*\text{STRUC}_C$ at various points yields different DOM systems based on animacy. Languages which instantiate the various types are indicated, but I forgo examples. See references cited above and in fn. 22.[22]

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[21]As predicted by the definiteness scale, personal pronouns are case-marked. So, generally, are names. According to Katz (1987), the likelihood of object marking on names correlates with the degree of familiarity with the name. For the Yiddish data, I have relied on Katz (1987) and Birnbaum (1979). Thanks to Ellen Prince for bringing the Yiddish data to my attention, to Jim Matisoff for suggestions regarding spelling, and to David Perlmutter for discussion. Perlmutter (p.c.) has suggested that the optionality of overt case with the two masculines mentioned in the text might be linked to definiteness.
[22] For Bayungo, Dhargari, and Dhalandji, see Austin (1981).

```
              ← *STRUC_C  [Kalkatungu, no objects]
*OJ/HUM & *Ø_C
     ⋮
                   ← *STRUC_C [Yiddish, only some human objects]
     ⋮

*OJ/ANIM & *Ø_C      *STRUC_C [Sinhalese, all animates, optionally]

     ⋮
                   ← *STRUC_C [Ritharngu, all human objects and some animates]
     ⋮
                      ← *STRUC_C [Dhargari, all animate objects ]

*OJ/INAN & *Ø_C
     ⋮
                      ← *STRUC_C [Bayungo, all animates and some inanimates]
     ⋮
                       ← *STRUC_C [Written Japanese, Dhalandji, all objects]
```
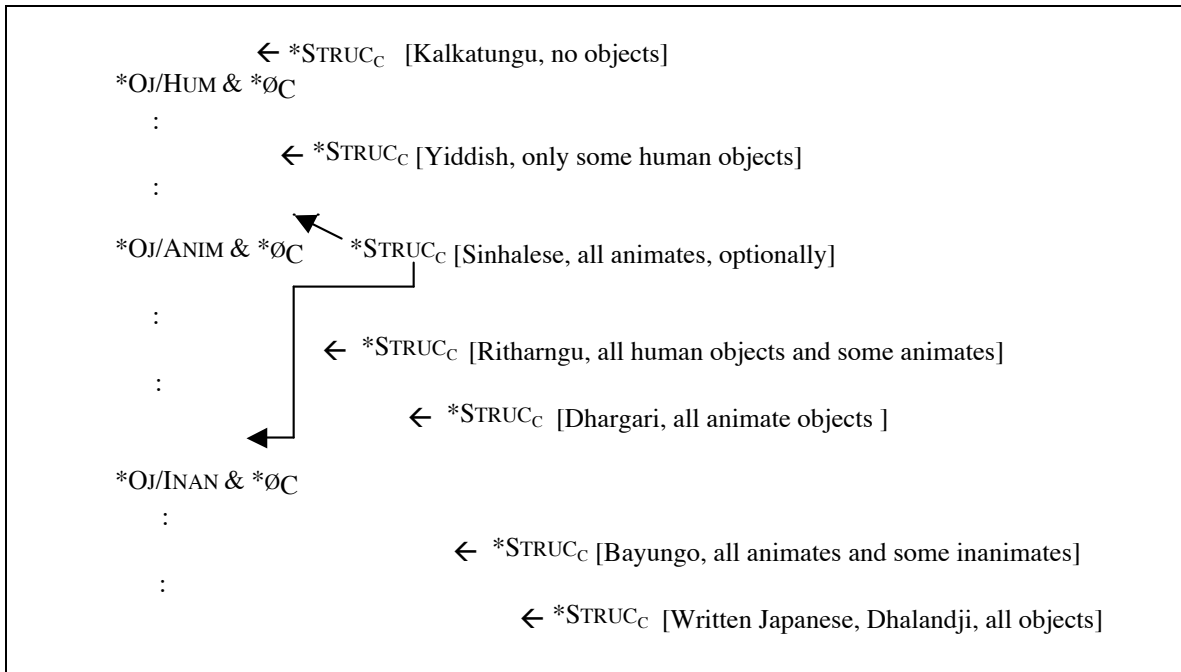
Figure 3: Interpolation of *STRUC_C in the subhierarchy on object animacy

The languages cited in Figure 3 are all consistent with the generalization that case-marking of relatively low prominence objects entails the possibility of case-marking of objects higher in prominence. This accounts predicts that the reverse is not found, e.g. languages in which only inanimates are case-marked, or only non-humans. To my knowledge, no such languages exist.

5   Two-Dimensional DOM

So far we have focused on languages in which DOM is determined by a single dimension of prominence, either animacy or definiteness. However, it is common for DOM to be determined by both. In Romanian, the possibility of DOM is largely restricted to objects which are both animate-referring *and* specific. However, within this space, distinctions in degree of definiteness are relevant to whether DOM is obligatory or optional: it is obligatory for pronouns or proper names, but optional for definites and indefinite specifics. In Hindi, both animate and inanimate objects can be case-marked, but case-marking of inanimates is possible only for definites, while case-marking of humans (and some animates) is possible for indefinites as well. Further, case-marking for human (and some animates) is generally obligatorily, while case-marking of inanimates is generally optional. Characterizing these systems then requires reference both to degree of animacy and degree of definiteness.
        The most straightforward approach to two-dimensional DOM involves the ranking of a set of composite properties, formed by crossing the animacy scale and the definiteness scale. The result is shown in Figure 4, which is constructed by taking the cross-product of those two scales. Each cell represents an expression which is classified

with respect both to animacy and to definiteness. Figure 4 represents the partial ranking of those expressions. [23]

Most marked for objects → Human Pronoun

Human PN   Animate Pronoun

Human Definite   Animate PN   Inanimate Pronoun

Human Specific   Animate Definite   Inanimate PN

Human Non-Specific Animate Specific Inanimate Definite

Animate Non-Specific   Inanimate Specific

Inanimate Non-Specific   ← *Least marked for objects*
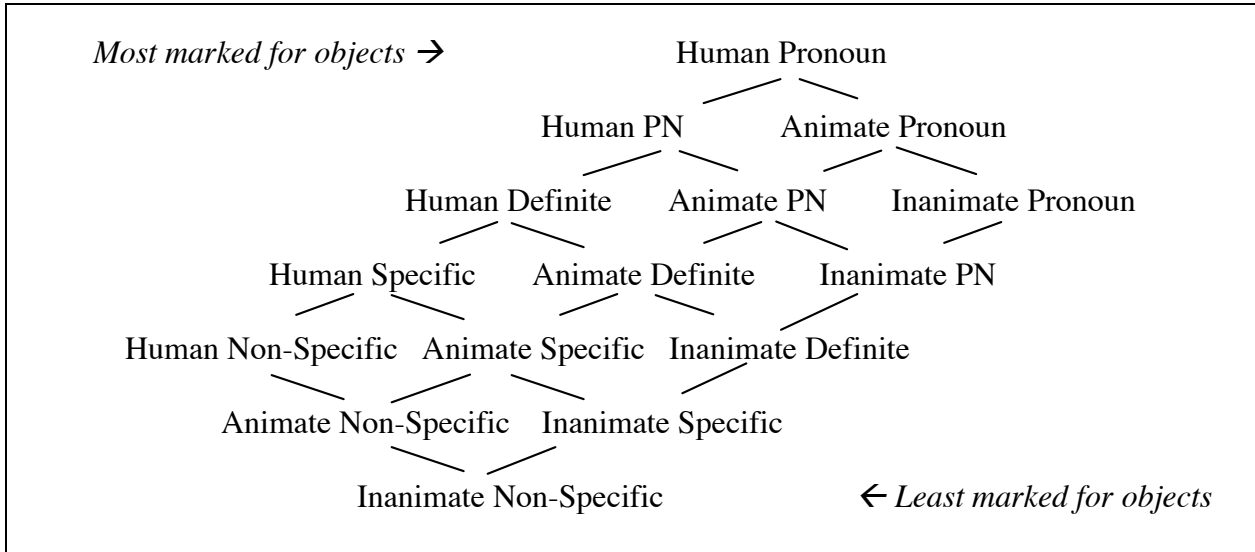

Figure 4: Relative markedness on the dimensions of animacy and definiteness

Universally, human-referring pronouns outrank all other expression types because HUMAN outranks all other values on the animacy scale, and PRONOUN outranks all other values on the definiteness scale. The ranking is partial because there is, for example, no universally fixed ranking between human proper names and animate pronouns: the first outranks the second with respect to animacy, but the second outranks the first with respect to definiteness. The ranking can be fixed in particular grammars; we will see an example below.

Recalling the basic principles underlying DOM from (3) (*the higher in prominence a direct object, the more likely it is to be overtly case-marked),* Figure 4 can be interpreted as a hypothesis about the distribution of two-dimensional DOM. Higher (dominating) elements are more likely to be case-marked *qua* objects than lower (dominated) elements. Intuitively, DOM should flow from the top of this structure down. Human pronouns outrank all other elements and should be the most susceptible, cross-linguistically, to DOM; inanimate non-specifics are outranked by all other elements, and should be least susceptible. More generally and precisely,

(33)   If in Figure 4, α dominates β, then:
   a. if an object of type β may be case-marked, then all objects of type α may be case-marked.
   b. if an object of type β must be case-marked, then all objects of type α must be case-marked.

---

[23] More precisely, if *a* ranges over values on one scale, and *b* over values on the other, then a pair $\langle a_1, b_1 \rangle \geq \langle a_2, b_2 \rangle$ iff $a_1 \geq a_2$ and $b_1 \geq b_2$.

c. if no object of type α can be case-marked, then no object of type β can be case-marked.

As noted, the structure in Figure 4 involves a partial ranking. Elements at the same level horizontally have no fixed relative ranking, e.g. human indefinite specifics and inanimate proper names have no fixed ranking since the former outrank the latter on the dimension of animacy, while the latter outrank the former on the dimension of definiteness. Thus, Figure 4 predicts that there could be two dimensional DOM systems in which human indefinites are case-marked, but inanimate-referring proper names are not (Romanian is an example), and as well as systems in which inanimate proper names are case-marked, but human indefinites are not (Hebrew is a near candidate, if we see Hebrew as a two-dimensional system per fn.18).

This account (i.e. (33)) makes a general claim about the distribution of case-marking in two-dimensional DOM systems: if an inanimate object at some degree of definiteness (e.g. pronoun, proper name, definite) can be case-marked, then so can a human and so can an animate at that same degree. In other words, case-marking of inanimate definites entails case-marking of *all* definites. However, case-marking of a human object at some degree of definiteness does not entail case-marking of non-human object at the same degree. Thus, Figure 4 predicts a situation which in fact seems to be common, one in which *all* objects at some degree of definiteness can be case-marked, but only human (or animate) objects at lesser degree of definiteness. In Romanian, for example, case-marking for humans and animates extends down to indefinite specifics, but in the case of inanimates, it extends only as far as pronouns. In Hindi, case-marking for humans and animates extends to indefinites, but for inanimates, it extends only to definites.

Figure 4 provides the right kind of structure for characterizing two other features of two-dimensional DOM systems, a property we will exploit below. One is the fact that these systems generally define three categories of objects: those for which case-marking is obligatory, those for which it is optional, and those for which it is impossible. These categories can be mapped onto zones in Figure 4: the first class occupies some upper region of that structure, the third class occupies some lower region, and the middle, optional, class occupies a middle region.[24] This is the case in Romanian, in 12th century Spanish, and in Hindi (see below for details on the latter two languages). And second, even in zones where DOM is optional, it is often the case that the probability of case-marking varies depending on the particular properties of the object. Again, Figure 4 provides the right structure: higher (dominating) elements are more likely to be case-

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[24] Where case-marking is optional (by virtue of animacy/definiteness), its presence or absence may be determined by other factors. In Spanish, object marking is optional for animate (non-human) definites and for human indefinites. Weissenrieder (1990) argues that topicality is relevant to whether marking occurs with the first class (animate definites); Torrego (1998) argues that the (a)telicity of the predicate is relevant in the marking of the second (indefinite humans). Since telicity plays no role when the object is definite (Torrego, p. 17), it is worth considering whether telicity only indirectly determines case-marking via its effect on specificity (see fn. 3).

marked than lower (dominated) elements. We will see below how these properties of Figure 4 play a role in the evaluation of candidate sets.

In order to implement the structure in Figure 4, we need a constraint set which corresponds to it. Such a set can be straightforwardly derived via two applications of constraint conjunction. The first conjoins the subhierarchy on object animacy (12b) with the subhierarchy on object definiteness (15b). This yields a set of constraints which corresponds exactly to Figure 4: the highest ranked constraint is *OJ/PRO & *OJ/HUM, and the lowest ranked is *OJ/NSPEC & *OJ/INAN. These constraints differentially penalize objects depending on features of both animacy and definiteness, independent of what case marking they may carry. The high-ranking constraint, *OJ/PRO & *OJ/HUM, penalizes highly prominent objects, and plays a role in voice systems which preclude an object which is pronominal and human, but not one which is pronominal and inanimate (this is the case in Chamorro, for example, when the subject is lexical (Chung 1984)). To make these constraints relevant to case-marking, the entire, partially ranked subhierarchy is conjoined with *ø$_C$. The result maintains the partial ranking of the input subhierarchy. Thus, the highest ranked constraint is [[*OJ/PRO & *OJ/HUM] & *ø$_C$] (abbreviated below *OJ/PRO-HUM & *ø$_C$), and the lowest is [[*OJ/NSPEC & *OJ/INAN] & *ø$_C$]. The full subhierarchy is shown in Figures 6-9 below.

Assuming that DOM can 'cut off' at any point consistent with (33), the structure in Figure 4, and the constraint set which implements it, defines a very large set of possible DOM case systems. It is premature to assess the extent to which these possibilities are actually realized, but some examples of how DOM structures the space defined by the structure in Figure 4 will illustrate the nature of two-dimensional DOM systems. The following sections treat the DOM systems of 12th century Spanish (as attested in the epic poem *Cantar de Mío Cid*), Hindi, and Persian – a set of languages which vary in interesting ways with respect to the class of objects which can be case-marked. With very few exceptions, 12th c. Spanish permits case-marking only of animates, but definiteness plays a role in restricting its scope. In Hindi, DOM is 'driven' primarily by animacy, but there is significant incursion into the class of inanimates. In Persian, DOM is primarily driven by definiteness, but animacy also plays a role.

A caveat is necessary here: the data around two-dimensional DOM systems is complex and relevant literature is sometimes incomplete or contradictory. The following discussions are based on my understanding of the source material, but no doubt they are inaccurate and/or oversimplified in some respect(s). Hence, they should be regarded as approximations, or sketches, subject to clarification and correction.

5.1   Spanish of El Cantar de Mío Cid

Like Modern Spanish, the Spanish of the *El Cantar de Mío Cid* (henceforth *CMC*) marked some direct objects, but not all, with the preposition *a* (the same preposition used for marking indirect objects), i.e. it had DOM. This stage of the language distinguishes three categories of direct object: (i) those which must be case-marked, (ii) those which cannot be case-marked, and (iii) those which are optionally case-marked. Obligatorily marked are those direct objects which are (strong) personal pronouns and proper names

of both persons and animals (Melis 1995).[25] The category of optionally marked objects comprises common noun phrases referring to humans, both definites and indefinites (Melis 1995). Thus, as in Modern Spanish, a definite human-referring direct object may be case marked (34a). But unlike the modern language, it need not be, (34b).

(34) a. …rreciba *a   mios yernos*   como él pudier mejor.
          receive ACC *my sons-in-law as   he can   best*   CMC 2637
          [ask that] he receive my sons-in-law as best he can.
      b. …quando dexaron *mis fijas*   en el rrobredo de Corpes… CMC 3151
          when   they.left my daughters in the oak-forest of Corpes

Names of geographic places are also optionally marked (Monedero Carrillo de Albornoz 1978). I treat the latter as inanimate-referring proper names. Inanimate-referring common noun phrases are not case-marked. With some assumptions addressed below, this is mapped onto Figure 4 as shown in Figure 5.
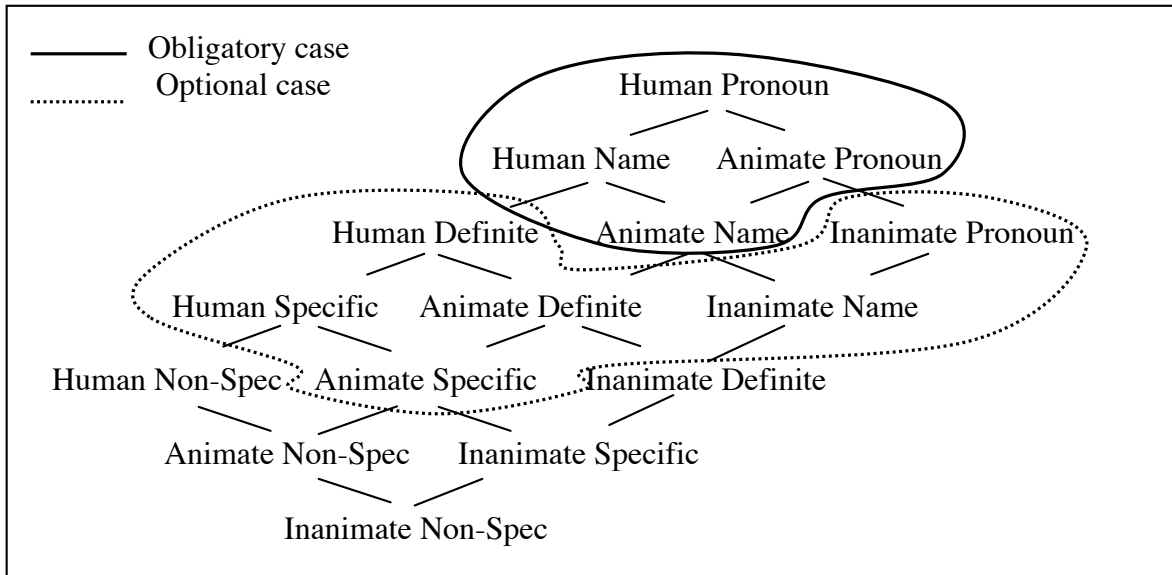

Figure 5: Object case-marking in Spanish of *Cantar de Mío Cid*

Figure 5 goes beyond what was described above in two respects. First, it includes inanimate pronouns in the class of optionally marked object directs. In fact, as in Modern Spanish, strong personal pronouns do not refer to inanimates at all in direct object function (Ramsden 1961), so there is no way to know whether they would be case-marked. Our account predicts that if they occurred, they would be case-marked. Second, Figure 5 distinguishes specific indefinites from non-specific indefinites, and asserts that the latter are never case-marked. According to García and van Putte (García and Putte 1995, p.124), only 22% of human-referring indefinites in the CMC are marked with *a*,

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[25] There is a slight idealization here. Personal pronoun objects are marked with *a* 100% of the time (13 instances). Personal names are marked 98% of the time (there are 52 instances, and 51 of them are marked). See García and van Putte (1995) for discussion.

and marking of indefinite singulars (35%) is more likely than marking of indefinite plurals (18%). The former are more likely to be specific than the latter. Further, *a* is more likely in 12th c. Spanish with objects denoting discoursally prominent arguments (Melis 1995). Cutting the data this way is also in line with the situation in Modern Spanish, where specific indefinites, but not non-specifics, occur with *a*. Not explicitly represented in Figure 5 is that case-marking is more likely for a human-referring common noun phrase which is definite (46%) than for one which is indefinite (22%), i.e. the probability of DOM decreases as one descends the structure in Figure 5. This situation is characterized by the constraint ranking shown in Figure 6 (see discussion above for how this partially ranked subhierarchy is derived).
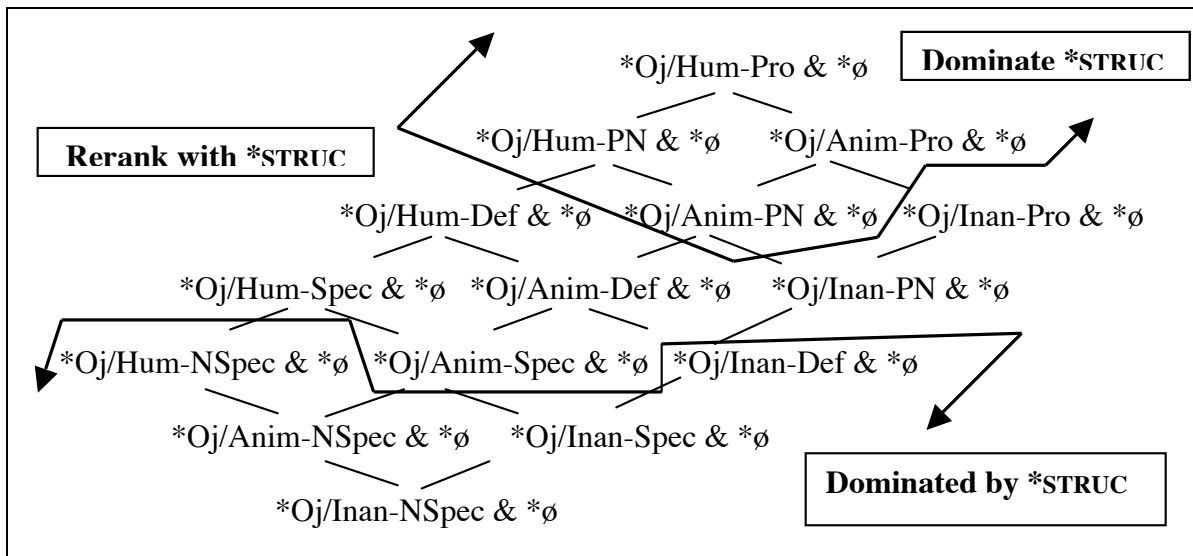

Figure 6: Characterizing DOM in the *Cantar de Mío Cid*

In the Spanish of the CMC, the four constraints at the top which favor case-marking of high prominence objects are strictly ranked above *STRUC$_C$. This guarantees overt case-marking for human and animate pronouns and proper names. The swathe of constraints at the bottom which favor case-marking for low-prominence objects are all dominated by *STRUC$_C$. This precludes case-marking for such objects. The constraints in the middle band govern case-marking of intermediate prominence objects. For these, case-marking is optional. This can be modeled by allowing *STRUC$_C$ to rerank with respect to each of these constraints. For each such constraint, there will be evaluations in which it outranks *STRUC$_C$, and evaluations in which it is outranked by *STRUC$_C$. Evaluations of the first type will yield winning candidates with case-marking, those of the second type will yield winners without case-marking. For the language as a whole, the result is the appearance of optionality (for discussion of optionality in syntax in classic (non-stochastic) OT, see (Müller 2003) and references cited therein). Further, it may be possible to characterize the diminishing frequency of optional case as one descends the structure in Figure 4 if the grammar is equipped with an algorithm for computing the probability of particular constraint rankings. The STOCHASTIC OT approach of (Boersma 1997), which involves probabilistic constraint ranking, seems to give the right kinds of results for two-dimensional DOM, and can account both for the optionality of case-

marking in the middle zone, and for the decreasing likelihood of overt case as one descends the hierarchy.[26]

The system of DOM attested in 12th c. Spanish is very close to that of modern Romanian, which, however, uses an entirely distinct preposition to mark the direct object (*pe*, from Latin *per*) (Farkas 1978; Dobrovie-Sorin 1994). As in 12th c. Spanish, the direct objects for which DOM is obligatory are the human- and animate-referring pronouns and proper names; the ones for which it is optional are the human and animate definites and indefinite specifics. Some inanimate pronouns can be marked with *pe*, but not inanimate (geographic) proper names, or any other inanimates. Both 12th century Spanish and Romanian then largely restrict DOM to humans and animates, with very limited incursion into the class of inanimates, and with definiteness playing an important role in restricting the extent of DOM (on the situation in Modern Spanish, see §5.4 below).[27]

5.2   Hindi[28]

Hindi marks some direct objects, but not all, with the postposition *ko* (again, the same postposition used for indirect objects). In general, Hindi permits more overt case-marking of objects than 12th c. Spanish (or modern Romanian) does. On the one hand, it requires overt marking in places that 12th c. Spanish permits (but does not require) it; on the other, it permits overt marking in domains where 12th c. Spanish disallows it. These differences should be describable by demoting $*\text{STRUC}_C$ among the constraints in Figure 6.

Hindi requires extensive case-marking for human-referring objects. As in 12th c. Spanish, case-marking is obligatory with human-referring personal pronouns and proper names (see, for example (Junghare 1983; Butt 1993) and other references in fn. 28.

(35)   *Adnaan-ne Naadyaa-ko/*Naadyaa bazaar-mẽ dek^haa.*
        Adnaan-ERG Naadyaa-ACC/Naadyaa market-in saw.PERF
        Adnaan saw Naadyaa in the market place.   (Butt 1993, p. 96)

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[26] In Boersma's approach, constraints are ranked on a continuous scale, rather than discretely. Hence two constraints may be relatively close or relatively distant. The grammar is also stochastic: at each evaluation, the constraint ranking is slightly perturbed. This has the consequence that when constraints are sufficiently close, alternative rankings are possible, resulting in variable outputs. In the present case, $*\text{STRUC}_C$ needs to be close enough in ranking to the entire set of constraints in the 'optional' zone that it can rerank with each of them. For a study of differential case marking in Korean in a Stochastic OT framework, see Lee (to appear).

[27] Spanish was discussed here rather than Romanian because of the very close relation in Romanian between DOM and clitic doubling. It appears to be true that every direct object which is doubled by a clitic is also marked with *pe*, though the reverse is not true. Hence, the description of DOM in Romanian might be parasitic on a description of clitic doubling.

[28] On DOM in Hindi, see Butt (1993), Junghare (1983), Magier (1987), Masica (1982), Mohanan (1993; 1994a; 1994b), and Singh (1994). The grammars of McGregor (1972), and Kellogg (1938) are also informative.

But it is also obligatory with human-referring definite descriptions, and appears to be the rule for indefinites as well. Mohanan (1994a, 80) cites (36a) below showing that a human object must be case-marked, whether it is interpreted as definite or indefinite; Comrie (1989, p. 133) cites (36b) to show that case-marking is preferred in this situation.

(36)   a.   Ilaa-ne *bacce-ko/*baccaa* u<u>t</u>^haayaa.
                I.-ERG   child-ACC/ child   lift.PERF
                Ila lifted a/the child.
       b.   ?Aurat   *baccaa* bulaa rahii   hai.
                woman child   calling PROG is
                The woman is calling a child.

Mohanan's discussion implies that even non-specific (referential) indefinites require *ko* when they refer to humans. However, Masica (1982) cites text examples of this sort without *ko*, so I will assume that case-marking is obligatory with specific indefinites, but optional with non-specifics, when these are human-referring.

The two languages contrast sharply in their treatment of inanimates. 12th c. Spanish does not permit overt case-marking for inanimates except for proper names. In Hindi, overt marking is an *option* for inanimates, but *only when definite*.[29] Thus, both (37a,b) are possible, and while the object in (37a) can be interpreted as either indefinite or definite, the case-marked one in (37b) must refer to an already mentioned banana:

(37)   a.   Ravii-ne *kaccaa kelaa*   kaa<u>t</u>aa.
                Ravi-ERG unripe banana cut
                Ravi cut the/an unripe banana.
       b.   Ravii-ne *kacce   kele-ko*   kaa<u>t</u>aa.
                Ravi-ERG unripe banana-ACC cut.PERF
                Ravi cut the unripe banana.   (Mohanan 1994a, pp. 87-88)

Object marking has quite a different function then for inanimates than it has for humans: in the case of inanimates only, it marks *definiteness*. The claim that *ko* is possible with indefinite animates, but not indefinite inanimates, is supported by Singh's observation that the indefinite marker *ek* may occur with *ko* marked objects if they refer to animates (38a), but not inanimates (38b) (1994, p. 227). Analogous data is cited in Mohanan (1994a, p. 79).

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[29] Hindi sources vary considerably on the status of overt object marking on inanimates. Most suggest it is restricted to *definites,* However, Butt (1993) claims that it is possible for specific indefinite inanimates as well, and cites several examples. In contrast, Singh (1994) implies that some speakers disallow *ko* with inanimates altogether. Whether this is due to dialect variation or to factors not controlled for needs to be clarified. This is a complex domain since context, word order, and aspect (in addition to overt case) all play roles in fixing the specificity of inanimate direct objects in Hindi (Mahajan 1990; Butt 1993; Mohanan 1993, 1994a; Singh 1994).

(38) a.   Laṛke-ne aaj   subah   *ek laṛkii-ko* dekʰaa.
          boy-ERG   today morning one girl-ACC see.PERF
          The boy saw a girl this morning.
     b.   *Laṛke-ne aaj *ek pʰuul-ko*   dekʰaa
                        one flower-ACC
          (The boy saw a flower this morning.)

Figure 7 characterizes the distribution of *ko*.

Figure 7: Characterizing DOM in Hindi

Figure 7 defines three zones for overt case-marking in Hindi: an obligatory zone (defined by the constraints in the upper third of the structure), an optional zone (defined by the constraints in the middle zone), and an excluded zone (the two constraints at the bottom). All human-referring constraints fall in the obligatory zone, except for the one which involves non-specifics, which falls in the optional zone. No inanimate-referring constraints fall in the obligatory zone. Those which refer to definite inanimates fall in the optional zone, and the others fall in the excluded zone. The facts for animates have been less discussed in the literature, so the treatment in Figure 7 is somewhat arbitrary. As noted earlier, Mohanan reports that some animals are treated like inanimates, in the sense that the presence of *ko* entails definiteness, while others (e.g. lions and elephants) are treated like humans. I have assumed that if animals are referred to by personal pronouns or proper names, that they will assimilate to the human class and require overt case-marking; animate definites are included in the optional zone, perhaps an oversimplification.

As noted at the outset, on the whole, Hindi allows for more overt case-marking of objects than does 12th c. Spanish . Obligatory marking is found with a larger class of objects in Hindi than in 12th c. Spanish: it is optional with human definites in 12th c. Spanish, and obligatory in Hindi. This is reflected by the ranking of *STRUC$_C$ in Figures 6 and 7. In Hindi, the constraint which penalizes zero marking of human definite objects (*OJ/HUM-DEF & *Ø$_C$) is among those which strictly dominate *STRUC$_C$. In 12th c. Spanish, it is among those which rerank with *STRUC$_C$. Furthermore, case-marking is

extended to definite inanimates in Hindi, but not in 12th c. Spanish. Hence, the constraint which penalizes zero-marking of inanimate definites strictly outranks *STRUC$_C$ in 12th c. Spanish, but the same constraint reranks with *STRUC$_C$ in Hindi. Despite the differences, both languages are consistent with the basic hypothesis: if overt marking is possible with direct objects with property α, then it is possible with direct objects with property β, where β dominates α in Figure 4.

5.3   Persian[30]

Lazard (1984) observes that Persian and Hindi are languages in which both definiteness and animacy play a role in determining DOM, but he suggests that the two languages differ in how each of the dimensions is weighted: animacy is 'stronger' than definiteness in Hindi, while in Persian, definiteness is 'stronger' than animacy. If this is correct, it should correspond to a difference in constraint ranking. We are fortunate in having Lazard (1982), a thorough and thoughtful discussion of DOM in Persian (see also Bossong (1985, pp. 57ff)).

Persian uses the suffix *-râ* to mark some but not all direct objects. Lazard distinguishes three values for definiteness, which correspond to what I am calling DEFINITE, SPECIFIC, and NON-SPECIFIC. He observes (p. 181) that all definites are obligatorily suffixed with *-râ*, regardless of animacy, e.g.

(39)   *Ketâb-râ*   xândam.
        book-ACC I.read
        I read the book.

Indefinites are optionally marked, but according to Lazard, specific indefinites are, as a rule, marked (p. 183). He notes two classes of specific indefinites: those which have a partitive sense, and those with the sense of *a certain*. Both classes require the suffix *-râ*, exactly as both classes require the accusative suffix in Turkish.

(40)   *Yeki   az ân   ketâbhâ-râ* xândam.
        INDEF of DEM   books-ACC I.read
        I read one of these books.
(41)   *(Yek) ketâb-i-râ   xând   ke…*
        INDEF book-INDEF-ACC he.read which
        He read a certain book which…

 In contrast to both Spanish (12th c. and Modern) and Hindi, this is so irregardless of the animacy of the object. Persian, like Turkish then, requires case-marking for all specific objects.

With respect to other non-specific indefinites, however, Persian appears to be different from Turkish. For the class as a whole, case-marking is optional, but within the class of non-specifics, the distribution of case-marking is determined by animacy. According to Lazard, the probability of case-marking decreases sharply as one moves

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from human to inanimate. The result is that marking is found generally with humans or animates, but not with inanimates. Lazard cites three minimal pairs as evidence (Lazard 1982, 185-6), all examples in which the objects seem to be equivalent with respect to definiteness, but not with respect to animacy. In (42), Lazard notes a *preference* to include *-râ* when the object is human and a *preference* to omit it when the object is inanimate.

(42)   a.   *Mard-i-râ*   did.
                man-INDEF-ACC he.saw
                He saw a man.
        b.   *Medâd-i*   xarid.
                pencil-INDEF he.bought
                He bought a pencil.

Example (43) conflates two examples, which differ only with respect to animacy of the object:[31]

(43)   Çah-e   tork nazd-e   emperâtur-e rum *qâsed-i-râ* /   *payâm-i*
            king-EZ Turk before-EZ emperor-EZ Rome messenger-INDEF-ACC/ *message-INDEF*
            ferestâd tâ bâ   u   hamdast çavad.
            he.sent so with him ally   he.became
            The king of the Turks sent a messenger /a message to the Roman emperor in order to ally with him.

In the first version of (43), with a human-referring object, *-râ* could be omitted, but it is preferably present; in the second, the suffix 'ne pourrait guère accompagner *payâm-i*' [could scarcely accompany *payâm-i*, JA]. The final example is one in which case-marking the object alters the sense in a direction that correlates with animacy (Lazard does not suggest that the count/mass distinction which is also present in this pair is relevant):

(44)   a.   *Xarguç-râ* dust dâram
                rabbit-ACC liking I.have
                I like rabbits.
        b.   *Xarguç* dust dâram.
                rabbit liking I.have
                I like rabbit.

      In general, there is more obligatory object marking in Persian than in either 12th c. Spanish or Hindi. This is reflected in Figure 8 by the fact that *STRUC$_C$ is outranked by a significantly larger set of constraints than in either of the other two languages. Since overt case-marking is required for specific inanimates, * STRUC$_C$ must be dominated by

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[31] 'EZ' in (43) glosses the clitic *–e* (the *ezafe*), which occurs between a nominal head and post-head modifiers.

*Oj/Inan-Spec & *ø. This means that it is dominated by every constraint which dominates *Oj/Inan-Spec & *ø.
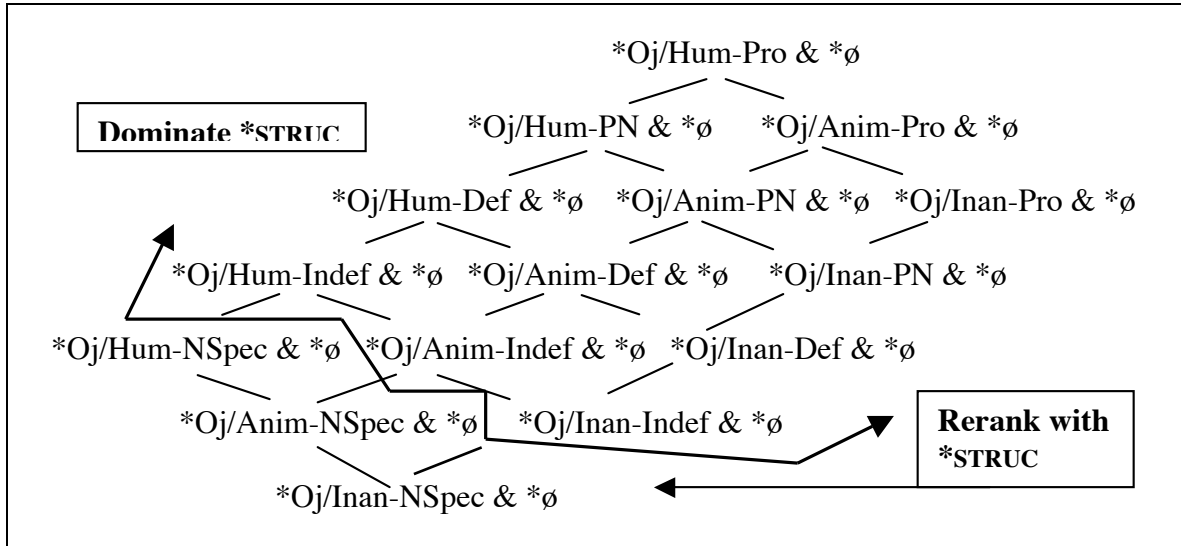

Figure 8: Characterizing DOM in Persian

Animacy comes into play, according to Lazard's description, only with low-salience indefinites, where case-marking is optional, but where the probability of case-marking declines as one descends from humans to inanimates. In Figure 8, the relevant constraints are the three below the line, which form a subhierarchy which is strictly ranked. Each of the three constraints reranks with *STRUC$_C$, but the probability of dominating *STRUC$_C$ sharply decreases as one descends the subhierarchy, a fact which can be expressed in Stochastic OT by fixing appropriately the relative closeness of the four constraints involved.

5.4   The spread of DOM

This account also makes some predictions about the historical expansion of DOM. If DOM is correctly characterized in terms of the constraint hierarchy in Figure 6 and the ranking of *STRUC$_C$ with respect to that hierarchy, then DOM should expand (and retract) along the paths defined in that figure. While the actual conditions on DOM may vary from one period to another, the generalization that more prominent direct objects are always more likely to be case-marked than ones of lower prominence should hold at all stages. I do not know of cases of retraction, but Spanish and Persian are both languages in which the expansion of DOM has been documented, and each is consistent with the scenario sketched above.

    DOM occurs widely in Romance today, but it was not a feature of Latin. The preposition *a* first appeared as a direct object marker with the personal pronouns and with proper names (García and Putte 1995; Melis 1995; Pensado 1995a). As noted above, in 12th c. Spanish, it was obligatory with these categories of direct object, and clearly optional with human/animate common nouns. The situation in Modern Spanish is complex, but one difference is clear: *a* is now essentially obligatory with definite and

indefinite-specific, human-referring direct objects.[32] For example, *a* is required in (45), but was not required in 12th c. Spanish (cf. example (34a)).

(45) Dejaron *(a) *mis hijas*   en el bosque.
      they.left   ACC *my daughters in the woods*

      The difference in constraint ranking between these two periods of the language can be (partly) characterized as demotion of the economy constraint *STRUC$_C$ below the constraints which penalize zero marking for definite and specific human-referring objects. This is shown in Figure 9 (the dotted line shows the ranking posited earlier for the Spanish of the CMC).
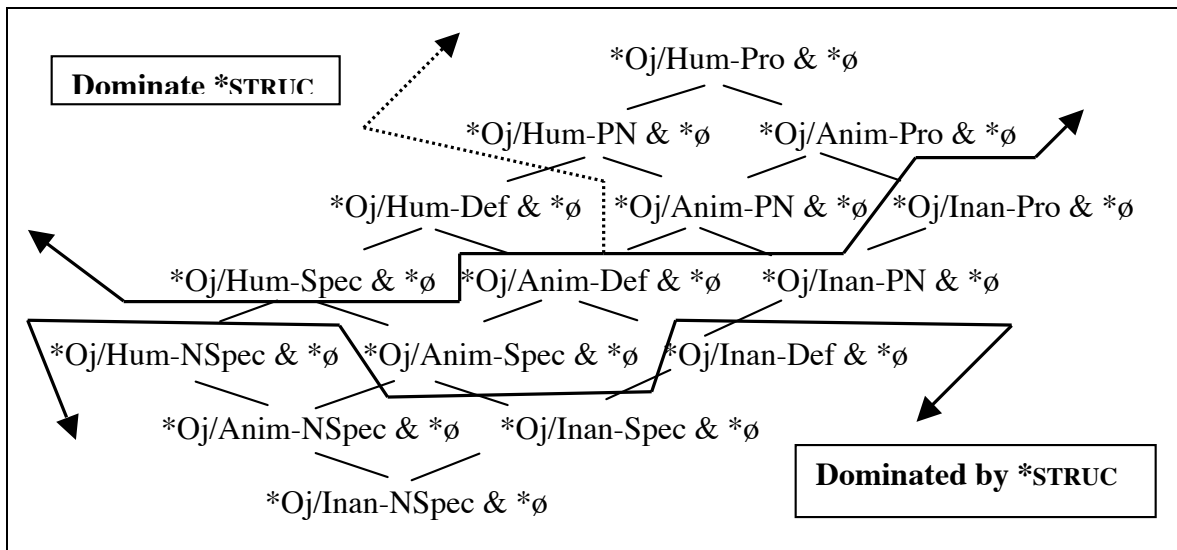
Figure 9: The spread of DOM from Old to Modern Spanish

Although Figure 9 oversimplifies in some respects (e.g. inanimate common noun objects are in some contexts case-marked (see especially Weissenrieder (1985)), it does characterize fairly accurately one important change in the distribution of DOM in Spanish.

      DOM was first documented in Persian in documents of the 9th and 10th centuries; it had not been a feature of Middle Persian (Bossong 1985, pp. 58ff.). In its first documentation, DOM was found only with definite objects, and it was optional. At present, DOM is obligatory with definite objects, and furthermore, it has extended into the class of indefinite objects. For some of these, it is apparently obligatory; for others, it

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[32] On DOM in Spanish, see Isenberg (1968), Kliffer (1982), Laca (1995), Pensado (1995b), Torrego (1998), and Weissenrieder (1985; 1990; 1991) as well as standard textbooks like Ramsey (1894/1956) and Butt and Benjamin (1988). On the historical development of DOM in Spanish, see Laca (2001).

is optional. In Persian too, then, the historical expansion of DOM can be expressed as demotion of the economy condition, *STRUC$_C$, among the constraints in Figure 6.[33]

6.   Harmonic Alignment and Differential Subject Marking

This analysis developed in this paper is based on a conception of DOM which is well-developed in the functional and typological literature cited earlier. In that conception, DOM involves the morphological marking of those nominals which are most marked as objects. The goal here has been to show that this conception can be expressed quite directly within a formal approach to grammar based on Optimality Theory. Central to the account is the operation of *harmonic alignment* which derives constraints that express the relative markedness of the various nominal types in the grammatical *object* function.

However, by definition (see fn. 7), harmonic alignment does more than this: it automatically derives a set of constraints which express the relative markedness of exactly the same nominal types in the grammatical *subject* function. Hence, this account predicts that there should be case-marking systems in which some subjects are marked, but not all and it predicts that the factors that favor differential subject marking (DSM) will be the mirror image of those that favor DOM. That both types of systems exist and that they are in a mirror image relation was the main point of Silverstein's original work on this subject (1976; 1981). Hence, harmonic alignment succeeds in capturing Silverstein's generalization.

Figure 4 predicts that if any subjects are case-marked, it will be common noun subjects, and within that class, inanimate, indefinite ones. Least likely to be case-marked are human-referring personal pronouns, especially 1st and 2nd person. These predictions are realized in languages like Guugu Yimidhirr (Pama-Nyungan) in which all transitive subjects are overtly case-marked *except* personal pronouns (Haviland 1979), as well as in Punjabi (Indo-European) and Dyirbal (Pama-Nyungan), where all subjects *except* 1st and 2nd person pronouns are case-marked (Dixon 1972; Bhatia 1993). (DSM is widely known as 'split ergative' case-marking, but this is a confusing misnomer, since it has nothing to do in any significant sense with ergativity (on this point, see especially Goddard (1982)).) The prediction may also realized in languages like Lakhota in which inanimate agents are marked with the instrumental postposition (if these are subjects) (Van Valin 1985).

Woolford (2001, 535) suggests that differential marking of subjects is not related to DOM, citing the fact that the former does not make reference to multiple dimensions, i.e. to both animacy and definiteness. It is true that complex systems of the sort found in Spanish, Hindi, and Persian DOM are hard to find for DSM, but it does not seem to be true that they do not exist. In Fore, for example, neither personal pronouns *nor* proper names may be marked in subject function, but inanimates must be (Scott 1978; Donohue 1999). These correspond respectively to the least marked and the most marked subjects

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[33] Romanian and Afrikaans are other languages in which the spread of DOM can be documented (Manoliu-Manea 1993; Ponelis 1993, 265ff.). According to Bossong (1991), the usual scenario with DOM is expansion, not retraction. DOM may expand to cover all objects as it apparently has in Japanese, thereby ceasing to be differential. If case-marking is lost, for whatever reason, a new DOM system may develop.

(see Figure 4). Elements between the two extremes may, and under some circumstances must, be marked as subjects. The present account predicts that such systems should exist. Central to their description will be the constraint hierarchies on *subject* definiteness and *subject* animacy, conjoined with Star Zero.

It is right though to ask why DSM is so much less common than DOM. There are asymmetries between subject and object which may be relevant. One factor is that subject agreement is more widespread than object agreement, and this formal relation serves to identify the subject. Another is that on the whole, the preference for unmarked subjects (with respect to animacy and definiteness) appears to be more rigorously enforced than the preference for unmarked objects (Woolford 2001). In the domain of animacy, the linking principles based on semantic role are already biased towards animate and especially human *subjects*, while there is no corresponding bias for inanimate *objects. (*See the Proto-Agent and Proto-Patient properties of Dowty (1991)).[34]) As noted in §2.2.2, a constraint proscribing indefinite subjects is common. To the extent that marked subjects are excluded, the domain for DSM is reduced, and this may account for why differential marking of subjects is less common and less elaborated than that of objects.

7.   Other Expressions of Markedness Reversal

This paper has focused on one of the ways that markedness reversal in the association of grammatical function with animacy and definiteness is expressed, namely overt, morphological case. No doubt, there are others. Given the parallel between case and agreement, it would be surprising if similar patterns were not expressed in agreement systems. Indeed, as is well-known, object agreement is realized differentially in a number of languages, along the dimensions of person, animacy, and definiteness. Bantu is a clear example (see, for example, Hawkinson and Hyman (1974), Morolong and Hyman (1977), and Kidima (1987), as well as Morimoto (2002) (which is framed in terms like those of the present paper), and the references therein.

Another way in which these reversals might be expressed is through word order. One of the important results of generative work on this topic is the idea that DOM is related to the phenomenon of object shift. In a number of languages, local movement of the object to a higher position has some of the same interpretive effects as DOM, particularly with respect to the dimension of definiteness. In a number of languages,

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[34] Dowty's Proto-Agent entailments include (a) volitional involvement, (b) sentience, (c) cause of an event or change of state, (d) movement, (e) existence independent of the event named by the verb. Properties (a) and (b) are characteristic of animates, but not inanimates; (c) and (d) tend also to be associated with animates. Proto-Patient entailments are (a) change of state, (b) incremental theme, (c) causally affected, (d) stationary, (e) existence dependent on the event, (f) sentience/perception not entailed. Properties (a), (c), (d), and (f) involve no inanimacy bias; (b) and (e) may be biased to inanimates, and are associated with verbs which select inanimate objects.

definite objects can in general shift, but shifting an indefinite is possible only when it can be interpreted as specific. This is apparently so in Persian (Browning and Karimi 1994; Karimi 1999), Dutch (de Hoop 1996), Icelandic (Diesing and Jelinek 1995), and Hindi (Mahajan 1990; Butt 1993). There are also languages in which only object pronouns can shift, e.g. Danish (Holmberg 1986). The fact that object shift makes some of the same distinctions as DOM has been seen as evidence that DOM is the visible marking of Case which is assigned in the higher, shifted position and associated with particular interpretive effects.

The analysis developed here does not draw a connection between DOM and object shift. This is not because the basic ideas are incompatible with such a connection, but because the OBJECT relation is taken to be a primitive; case-marked and non-case-marked objects are assumed to have the same syntactic status, i.e. both are OBJECTS. Nonetheless, the essential conclusions reached here should be compatible with a variety of representational frameworks, including ones in which grammatical relations are interpreted phrase structurally, and where case-marked objects are associated with a relatively high phrase structural position and non-case-marked ones with a lower one (see Woolford (1995) for one implementation; see also Sells which suggests an approach to object shift in terms of harmonic alignment).

The interesting question is whether it is in fact correct to see DOM and object shift as reflections of the same underlying principles. This link seems to predict that the parallel between DOM and object shift which has been observed in the case of specificity should in fact hold more widely. In particular, we should find overt object shift constrained by animacy, and by various combinations of animacy and definiteness. The existence of animacy-sensitive object shift would strengthen the case for relating DOM to object shift. If it is not found, we need to ask why DOM is sensitive to both the dimension of animacy and definiteness, while object shift is sensitive only to the latter.

8.   Conclusion

Figure 4, and the corresponding constraint hierarchy in Figure 6 (ignoring the specific positioning of *STRUC$_C$), provides the basis for an account of DOM. The basic generalization is that direct objects are more likely to be overtly case-marked if they are positioned high in that figure than low. This likelihood is expressed not only cross-linguistically, but within individual languages. Case-marking may be possible (obligatory or optional) for a high prominence object but not a lower one. Or it may be obligatory for a high prominence object, but optional for a lower one. Or it may be possible for both, but with significant differences in attested frequency which correlate with degree of prominence. Once the constraint structure in Figure 6 is given, it is the ranking of *STRUC in that structure which accounts for all of these patterns. The same structure predicts the way that DOM systems expand historically.

The basic idea which underlies this analysis is there are two ways of dealing with marked structure in syntax. On the one hand, it can be avoided. Structures which are marked by virtue of containing high prominence objects and/or low prominence subjects, for example, can be avoiding by resorting to passive clauses. On the other hand, when marked structure is not avoided, it can be morphologically marked. DOM comes into

play when high prominence objects are not avoided, and thus surface. In the analysis developed here, it is the initial constraint hierarchies derived by alignment of prominence scales which enforce avoidance of marked structure (see §2.2). It is the conjunction of these same subhierarchies with the constraint *ø (STAR ZERO) (i.e. the subhierarchies of Figure 1, and that shown in Figure 6) which enforce morphological marking of marked structure.

David Pesetsky (1997; 1998) has suggested that Optimality Theory is a theory of constraint interaction in *phonology,* and that it is relevant to syntax only in the domain of pronunciation. The results achieved in the present analysis are possible only because it is articulated within a theory in which constraints are universal and violable. The question is whether this analysis deals with what is essentially pronunciation. It is true that DOM involves always the choice between audible case-marking and no case-marking, clearly a matter of pronunciation. But the analysis depends crucially on markedness constraints which have to do with aspects of syntax which are much deeper, i.e. transitivity and voice, phenomena which are not simply a matter of pronunciation.

The relevance of hierarchy alignment to both syntax and to phonology does, however, suggest a parallelism between these components. Many of the basic elements of phonology and syntax are different. Articulatory and acoustic parameters, syllable structure, and other low levels of prosodic organization are relevant to phonology but not syntax; grammatical relations, definiteness, and animacy are relevant to syntax but not to phonology. However, at a more abstract level there are fundamental similarities in the way that these elements associate. The basic principle is that prominent structural positions attract elements which are prominent on other dimensions. In phonology, the peak of the syllable is more prominent than the margins, and it attracts elements which are relatively high in sonority, leaving elements of lesser sonority to function as margins. In syntax, the subject is the most prominent argument position, and it attracts elements which are relatively prominent on one of various dimensions, e.g. semantic role, animacy, definiteness, person, topicality, leaving less prominent elements to function as non-subjects. In both domains, there is alignment of prominent substance with prominent structure.

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