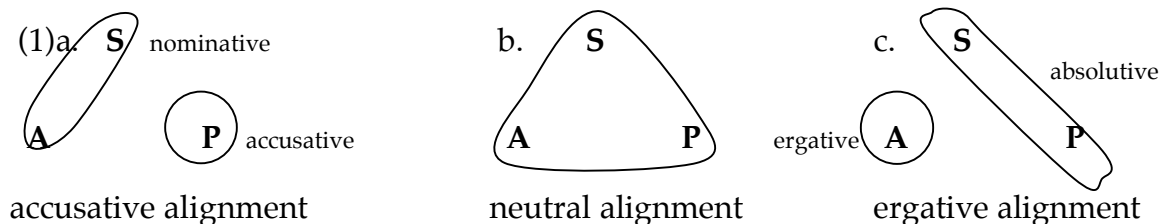


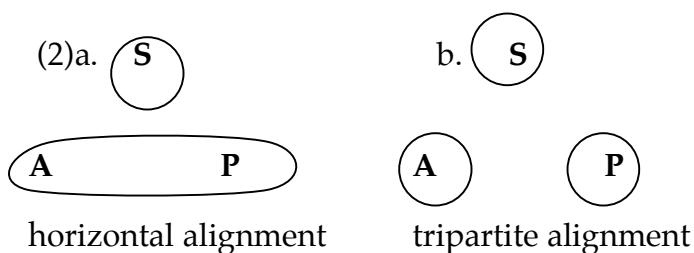
Explaining Syntactic Universals
 (MARTIN HASPELMATH, LSA Institute, MIT, LSA.206, 21 July 2005)
2. Universals of differential case marking

1. The major (monotransitive) alignment types



S = the single argument of an intransitive clause
 A = the most agent-like argument of a transitive clause
 P = the most patient-like argument of a transitive clause

two further logical possibilities, hardly attested:



Universal 4:

Case alignment is practically always neutral, accusative, or ergative. Horizontal alignment and tripartite alignment are extremely rare.

Explanation in terms of efficiency:

- The **horizontal** alignment type requires the same coding effort as the accusative and ergative alignments, but fails to make the important distinction between A and P. It is equally costly but less distinctive, and therefore clearly less efficient.
- The **tripartite** alignment requires more coding effort, but the distinction between S and A, and S and P is redundant because S+A and S+P do not occur together in the same clause. It is more costly but not more distinctive, and therefore clearly less efficient.

Universal 5:

In neutral alignment, the single case is always zero-coded; in accusative alignment, the nominative case is usually zero-coded; in ergative alignment, the absolutive case is almost always zero-coded.

Explanation in terms of efficiency:

In all these cases, the zero-coded case is by far the **most frequent** case. The most frequent case is the one hearers expect, and efficient coding systems only use overt coding for unexpected meanings.

2. Differential Object Marking (DOM)

= a difference in the form of overt case marking that depends on the intrinsic properties of the (*direct*) *object*, not on its semantic or syntactic role

(more precisely: Differential P Marking)

Universal 6:

UA#217

If any P is overtly case-marked, then all Ps that are higher on the animacy scale, the definiteness scale, or the person scale are marked at least to the same extent.

(Silverstein 1976)

2.1. The animacy scale: human > animate > inanimate

- (3) Spanish (only human)
El director busca el carro/el perro/a su hijo.
 'The director is looking for the car/the dog/his son.'
- (4) Russian (animate and human)
Miša uvidel dom/kot-a/brat-a.
 'Misha saw the house/the cat/the brother.'
- (5) Hungarian (inanimate, animate and human -- no split!)

	human	animate	inanimate
Vietnamese	–	–	–
Spanish	m	–	–
Russian	m	m	–
Hungarian	m	m	m

2.2. The definiteness scale: pronoun > proper noun > definite > specific > nonspecific

- (6) English (only pronoun)
Leyla saw hi-m/Yusuf/the boy/a boy.
- (7) older German (pronouns, proper nouns)
Friedrich sah ih-n/Gertrud-en/das Kind/ein Kind.
 'Friedrich saw him/Gertrud/the child/a child.'
- (8) Persian (pronouns, proper nouns, and definite)
Hasan u-ra/ Ali-ra/ ketab-ra/ ketab did.
 Hasan he-ACC Ali-ACC book-ACC book saw
 'Hasan saw him/Ali/the book/a book.'

Table 2.

	pronoun	proper n.	definite	specific	nonspecif.
Vietnamese	–	–	–	–	–
English	m	–	–	–	–
older German	m	m	–	–	–
Persian	m	m	m	–	–
Turkish	m	m	m	m	–
Hungarian	m	m	m	m	m

2.3. The person scale: 1st/2nd person > 3rd person

(9) Dyirbal (1st/2nd person only)

nad^a *ninu-na/* *balagara* *balgan*
 I.NOM you-ACC they.DU hit
 'I hit you/ them.'

Table 3.

	1st/2nd	3rd
Vietnamese	–	–
Dyirbal	m	–
Hungarian	m	m

2.4. Older explanations for differential marking of animate/definite objects

Caldwell (1856: 271)

"...the principle that it is more natural for rational beings to act than to be acted upon; and hence when they do happen to be acted upon – when the nouns by which they are denoted are to be taken objectively [i.e. are used as objects] – it becomes necessary, in order to avoid misapprehension, to suffix to them the objective case-sign."

Thompson (1912:75)

"...wenn die Sprache ein transitives Verb besitzt, in gewissen Fällen der Patiens als solcher durch sprachliche Mittel zur Unterscheidung von Agens gekennzeichnet werden muß, weil er sonst vom Hörer als Agens aufgefaßt werden würde. Zu dieser fälschlichen Auffassung ist der Hörer öfter dann disponiert, wenn das Objekt eine bestimmte Person bezeichnet. Ist andererseits die Person oder ein Tier Agens und ein unbelebtes Ding Patiens, so ist auch ohne sprachliche Bezeichnung ein solches Mißverständnis fast ganz ausgeschlossen."

[...if a language has a transitive verb, in certain cases the patient needs to be marked as such by linguistic means to distinguish it from the agent, because otherwise the hearer would interpret it as agent. The hearer is frequently inclined toward this wrong interpretation if the object denotes a definite human being. If, on the other hand, the human being or an animal is the agent and an inanimate thing is the patient, such a misunderstanding is almost completely excluded even without any linguistic marking.]

(Caldwell and Thompson cited after Filimonova 2005)

Silverstein (1976:113)

"This hierarchy expresses the semantic naturalness for a lexically-specified noun phrase to function as agent of a true transitive verb, and inversely the naturalness of functioning as patient of such."

Comrie (1989:128)

"...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... the construction which is more marked in terms of information flow should also be more marked formally"

Dixon (1994:85):

"Those participants at the left-hand end of the hierarchy are most likely to be agents..., and those at the right-hand end are most likely to be patients..."

(the term *differential object marking* is from BOSSONG 1985, 1991, 1998; see also Croft 1988, 2003:166-75, Lazard 2001)

3. Aissen's (2003) explanation in terms of "iconicity constraints" and an "economy constraint"

"The challenge then is to **develop a theory of DOM** [=differential object marking] which expresses the generalization in [Universal 3], and **at the same time** allows for the various ways in which DOM can be **implemented in particular languages.**" (p. 437)

i.e. Aissen wants to conflate explanation of universals with language-particular description, in the manner characteristic of generative linguistics.

This is typical of Optimality Theory more generally:

McCarthy (2002:1)

"One of the most compelling features of OT, in my view, is the way that **it unites description of individual languages with explanation of language typology...** OT is inherently typological: the grammar of one language inevitably incorporates claims about the grammars of all languages. This joining of the individual and the universal...is probably the most important insight of the theory."

Aissen simply presupposes that the universals should be explainable by generative linguistic theory:

"The fact that DOM is characterized in many languages by a great deal of apparent fuzziness has perhaps reinforced 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.**"

OT's strategy in many cases: take a known typological generalization, turn it into an OT constraint, and account for cross-linguistic variation by inserting counteracting constraints in different positions.

McCarthy (2002:40)

"Descriptive universals rarely make good constraints, but descriptive tendencies often do. Indeed, the success of OT in incorporating phonetic or functional generalizations is largely a consequence of its ability to give a fully formal status to the otherwise fuzzy notion of a cross-linguistic tendency. **Tendencies, then, are a good place to start theorizing about constraints...**"

Aissen starts with the Relational scale and the Animacy scale:

"The analysis rests on a set of proposed universal prominence scales which are part of universal grammar." (AISSSEN 1999:679):

- (10) Relational scale: **Su > Oj** (Subject > Object)
 (11) Animacy scale: **Hum > Anim > Inan** (Human > Animate > Inanimate)

"Harmonic alignment" yields "markedness hierarchies" (increasing markedness of associations from left to right):

- (12) a. Su/Hum > Su/Anim > Su/Inan
 b. Oj/Inan > Oj/Anim > Oj/Hum

Markedness hierarchies can be "implemented" as fixed/universal constraint subhierarchies (p. 443):

- (13) a. *SU/INAN >> *SU/ANIM >> *SU/HUM
 b. *OJ/HUM >> *OJ/ANIM >> *OJ/INAN

This expresses the fact that inanimate subjects and human objects are generally disfavored. But in fact they do occur, though languages pay the price of additional marking. What's really excluded is "marked" associations of relation and animacy that is not case-marked:

implemented as local conjunction with * \emptyset_{CASE} ("STAR ZERO CASE"):

- (14) *OJ/HUM & * \emptyset_{CASE} >> *OJ/ANIM & * \emptyset_{CASE} >> *OJ/INAN & * \emptyset_{CASE}

- (15) *OJ/PRO & * \emptyset_{CASE} >> *OJ/PN & * \emptyset_{CASE} >> *OJ/DEF & * \emptyset_{CASE}
 >> *OJ/SPEC & * \emptyset_{CASE} >> *OJ/NSPEC & * \emptyset_{CASE}

"The effect of local conjunction here is to link **markedness of content** (expressed by the markedness subhierarchy) to **markedness of expression** (expressed by * \emptyset). That content and expression are linked in this way is a fundamental idea of markedness theory (Jakobson 1939; Greenberg 1966). In the domain of Differential Object Marking, this is expressed formally through the constraints [shown immediately above]. Thus they are **ICONICITY CONSTRAINTS**: they favor morphological marks for marked configurations." (Aissen 2003:448)

"Iconicity" must be limited by "economy", otherwise all objects would get case. Hence, we need an economy constraint: *STRUC_{case} ("STAR STRUCTURE CASE").

This constraint is inserted among the constraints of the subhierarchy, thus yielding the different language types:

(16) a. Vietnamese

$\boxed{*STRUC_{case}} \gg *OJ/HUM \& * \emptyset_{CASE} \gg *OJ/ANIM \& * \emptyset_{CASE} \gg *OJ/INAN \& * \emptyset_{CASE}$

b. Spanish

$*OJ/HUM \& * \emptyset_{CASE} \gg \boxed{*STRUC_{case}} \gg *OJ/ANIM \& * \emptyset_{CASE} \gg *OJ/INAN \& * \emptyset_{CASE}$

c. Russian

$*OJ/HUM \& * \emptyset_{CASE} \gg *OJ/ANIM \& * \emptyset_{CASE} \gg \boxed{*STRUC_{case}} \gg *OJ/INAN \& * \emptyset_{CASE}$

d. Hungarian

$*OJ/HUM \& * \emptyset_{CASE} \gg *OJ/ANIM \& * \emptyset_{CASE} \gg *OJ/INAN \& * \emptyset_{CASE} \gg \boxed{*STRUC_{case}}$

A language such as "Anti-Spanish", which only case-marks inanimate objects, **cannot be described** in this system, because the constraints in the subhierarchy cannot be reranked.

Thus, Aissen achieves **explanation by constrained description**.

Method:

- Use the concepts of functional-typological linguistics (*scales, harmonic association, iconicity, economy*),
- translate them into OT (e.g. by adjusting the TYPEFACE),
- and claim that progress has been made.

"OT provides a way...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 ... is to develop an approach... that is formal and at the same time **expresses the functional-typological understanding of DOM**" (Aissen 2003:439)

But why do we need "constrained description"? Why not opt for a division of labor? (some universals are explained functionally, others in terms of innate constraints of the cognitive code/UG)

Different **underlying impulses** of generative grammar:

- (– use fancy abbreviations and notational conventions)
- explain as many facts as possible with the generative method ("explain universals")
- focus on arguments from the poverty of the stimulus ("explain acquisition")
- reduce the formal apparatus of UG as much as possible ("explain UG")

If Aissen's story differential object marking is successful, it could itself be an argument in favor of the general approach.

4. Problems with Aissen (2003)

(i) How are exceptions dealt with?

- Aissen seems to think that no exceptions exist (cf. p. 439: "absolute linguistic universals"), but see Filimonova 2005 (e.g. Nganasan: definite nouns have an accusative case, but personal pronouns lack it).

(ii) How are language-particular idiosyncrasies dealt with?

e.g. in German, DOM in noun inflection is found only in one small subclass of masculine nouns (Haspelmath 2002:245):

	MASCULINE			FEMININE		NEUTER	
NOMINATIVE	<i>Löwe</i>	<i>Mann</i>	<i>Garten</i>	<i>Frau</i>	<i>Nase</i>	<i>Kind</i>	<i>Buch</i>
ACCUSATIVE	<i>Löwe-n</i>	<i>Mann</i>	<i>Garten</i>	<i>Frau</i>	<i>Nase</i>	<i>Kind</i>	<i>Buch</i>
	'lion'	'man'	'garden'	'woman'	'nose'	'child'	'book'

(iii) The contrast may not be zero-overt, but short-long:

Dyirbal:	NOM	ACC	
1sg	<i>ɲadya</i>	<i>ɲayguna</i>	
2sg	<i>ɲinda</i>	<i>ɲinuna</i>	(cf. Carnie 2005)

(iv) Carnie 2005:4:

"From the standpoint of generative grammar, it isn't at all clear what the grammatical status of the [scales] is. They aren't constraints, procedures or rules. How the restrictions are imposed on the grammar isn't at all clear."

– but let us grant that the scales and the mechanisms for turning them into the right constraints (harmonic alignment, subhierarchies) are part of UG

(v) How do we know how the scales are aligned harmonically?

Answer: "The basic principle is that prominent structural positions attract elements which are prominent on other dimensions." (p. 476)

– This principle needs to be part of UG as well, and we need a general definition of "prominence" across the scales.

(vi) What is "markedness"? Aissen treats it as a primitive concept that everyone understands and that everyone agrees on.

"The OT account of DOM requires...constraints which characterize the relative **markedness** of various associations of grammatical function with animacy and definiteness." (p. 440)

– But in fact, the term "markedness" stands for a highly diverse range of different (often related) concepts, none of which is needed (see Haspelmath 2006). In this case, "markedness of associations of grammatical function with animacy/definiteness" can easily be replaced by "rarity".

Oj/Inan > Oj/Anim > Oj/Hum = human objects are rarer than inanimate objects

(vii) Iconicity: "Iconicity constraints: they favor morphological marks for marked configurations" (p. 448)

– But there is no need for a concept or principle of "**iconicity as markedness matching**"; all such cases can be explained by appealing to frequency and economy (Haspelmath 2003)

(viii) Iconicity would have to be built into the OT machinery (i.e. into UG) as well for Aissen's system to work:

"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 [4] were conjoined with *STRUC_{case} rather than with *Ø_{case}, all the predictions made by the present analysis would be neutralized. One possibility is to appeal to functional reasoning: although constraints formed by conjunction of the subhierarchies with *STRUC_{case} 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. (Aissen 2003:447-8, n. 12)"

In other words: Aissen's system is not restrictive enough, but **overgenerates vastly**. To explain why certain languages predicted by her OT account do not exist, she needs to "appeal to functional reasoning".

This totally undermines the whole effort, because it is **far simpler** to "appeal to functional reasoning" from the very beginning (thus dispensing with all the constraints, the prominence principle, the alignment mechanism and the subhierarchies).

5. Differential object marking as efficient coding

5.1. The fundamental insight: statistical associations in language use

The non-harmonic associations of syntactic role and animacy/definiteness are rare in discourse. Therefore more overt coding of non-harmonic situations is efficient. Inefficient languages are unattested or rare because they are inefficient, not because they are not learnable.

statistical data:

Thompson 1909 (for Russian): agents: 75% human
inanimates: 10% agents (cf. Filimonova 2005:78)

Zeevat & Jäger 2002, Jäger 2004: SAMTAL corpus of spoken Swedish

Table 4.

	animate	inanimate	pronoun	NP	definite	indefinite
subject	2948	203	2984	167	3098	53
object	317	2834	1512	1639	1830	1321

$p < 0.01\%$

5.2. In what sense is DOM efficient?

Frequencies lead to expectations, e.g. animate arguments are mostly subjects, and only rarely objects. Hence hearers expect an animate NP to be a subject. Object marking tells us then that against their expectations, the NP is to be understood as an object.

Inanimate arguments are mostly objects, so that hearers expect an animate argument to be an object. Marking it as such is relatively redundant. A coding system that exploits the redundancy is **efficient**.

5.3. Does DOM serve ambiguity avoidance?

Aissen (2003:437)

"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.**"

No, the threat of ambiguity is not sufficient:

(continued:) "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.**"

And of course many languages tolerate an amount of ambiguity, because the context usually gives enough further clues.

DOM is about maximizing distinctiveness with minimal effort, or minimizing confusion with maximal economy:

Comrie (1977:9)

"Given the general tendency in languages [for subjects to be definite/animate and objects to be indefinite and inanimate], instances where **confusion** will be particularly likely will be where one has either indefinite...and/or inanimate subjects, or where one has definite...and/or animate direct objects."

5.4. How do languages come to have efficient case-marking?

The functional factors assert themselves in language use. Language use affects language structure through language change. Where they have a choice, speakers will tend to prefer more efficient coding strategies, and these usage preferences may become part of language structure.

– *Morphosyntactic innovations tend to eliminate inefficient patterns created by phonological change* (cf. Bossong 1985):

	Latin	>	Old French	>	Middle French	
NOM	<i>mur-us</i>		<i>mur-s</i>		<i>mur</i>	'wall'
ACC	<i>mur-um</i>		<i>mur</i>		<i>mur</i>	

– *Introduction of more distinctive patterns may be limited by perceived redundancy:*

e.g. Spanish introduced a new direct-object marker *a* (by semantic extension from the dative *a*) which is first used where it is most needed (with personal pronouns), then spreads to all animate objects, but hasn't spread further yet.

<i>Veo a ti.</i>	<i>Veo a Juan.</i>	<i>Veo a mi marido.</i>	<i>*Veo a mi perro.</i>
'I see you.'	'I see Juan.'	'I see my husband.'	'I see my dog.'

e.g. Old High German extended the accusative suffix *-an* from pronouns to personal names, where it is most needed, but not further.

NOM	<i>er</i>	<i>dese</i>	<i>hwer</i>		<i>Hartmuot</i>	>	<i>Hartmuot</i>
ACC	<i>inan</i>	<i>desan</i>	<i>hwenan</i>		<i>Hartmuot</i>		<i>Hartmuot-an</i>
	'he'	'this'	'who'				

– *Elimination of distinctive patterns may be limited by non-redundancy:*

e.g. in the Old High German *n*-declension, animate and inanimate nouns alike had a distinction between nominative and accusative (cf. 15). Then the nominative-accusative distinction was lost in inanimate nouns (following the pattern of the other declension types), and in Modern German only animates preserve the zero-marking in the nominative (Haspelmath 2002:245).

(17)			Old High German	>	Modern German
	NOM.SG	<i>affo</i>	<i>knoto</i>		<i>Affe</i> <i>Knoten</i>
	ACC.SG	<i>affon</i>	<i>knoton</i>		<i>Affen</i> <i>Knoten</i>
		'ape'	'knot'		'ape' 'knot'

5.5. How does the efficiency-based approach avoid the problems of Aissen 2003?

(i) Exceptions: Exceptional languages are inefficient with respect to a given aspect of structure, but not unacquirable. Exceptions may arise if other motivating factors happen to create a system that is inefficient from a case-marking point of view, e.g. phonological factors:¹

¹ Another example is the use of genitive case for animate objects in Russian:

Miša uvidel stol-Ø/kot-a/brat-a/stol-y/ptic-Ø
'Misha saw the table/ the cat/ the brother/ the birds.'

NOM	<i>stol</i>	<i>kot</i>	<i>brat</i>	<i>picc-y</i>	<i>ptic-y</i>
ACC	<i>stol</i>	<i>kot-a</i>	<i>brat-a</i>	<i>picc-y</i>	<i>ptic</i>
GEN	<i>stol-a</i>	<i>kot-a</i>	<i>brat-a</i>	<i>picc</i>	<i>ptic</i>
	'table'	'cat'	'brother'	'pizzas'	'birds'

In animate nouns whose accusative would otherwise be identical to the genitive, the accusative *consistently* adopts the form of the genitive. Almost always, this leads to a longer form than the nominative, but occasionally, the genitive is zero, so that DOM is zero-coded.

	Latin	>	Old French
NOM	<i>mur-us</i>		<i>mur-s</i>
ACC	<i>mur-um</i>		<i>mur</i>

(ii) Language-particular idiosyncrasies: No problem, because the explanation is separate from the description.

(iii) Zero-overt vs. short-long: The efficiency explanation predicts short-long, and zero-overt only as a special case of this.

(iv) Status of the scales: They are convenient tools for the cross-linguistic generalizations made by linguists and have no status for the speakers. No scales are needed for language-particular descriptions.

(v) How do we predict harmonic associations? The explanation uses observed text distributions as a point of departure. It would also work if we had no explanation for the text distributions.

But it's easy to speculate about explanations: Humans are more interested in events initiated by humans, so they talk much more about such events than about other types of events. Agents tend to be topics and therefore definite because when we talk we adopt the point of view of the agent, etc.

(vi) The role of markedness. "Markedness" plays no role.

(vii-viii) The role of iconicity. Iconicity plays no role.

5.6. Conclusion

– Aissen's story on DOM is not successful.

– Hence, there is no reason not to adopt Caldwell's (1856) and Thompson's (1909/1912) approach and explain DOM in functional, efficiency-based terms.

If desired, this old functionalist approach can be formalized in terms of

- plain (functional) OT (Zeevat & Jäger 2002),
- bidirectional stochastic OT (Jäger 2004, Morimoto & de Swart 2005)
- Evolutionary Game Theory (Jäger 2005+)

6. Differential Subject Marking

mirror image of Universal 6:

Universal 7:

UA#217

If any A is overtly case-marked (with "ergative" case), then all Ps that are lower on the animacy scale, the definiteness scale, or the person scale are marked at least to the same extent.

(Silverstein 1976)

Table 5.

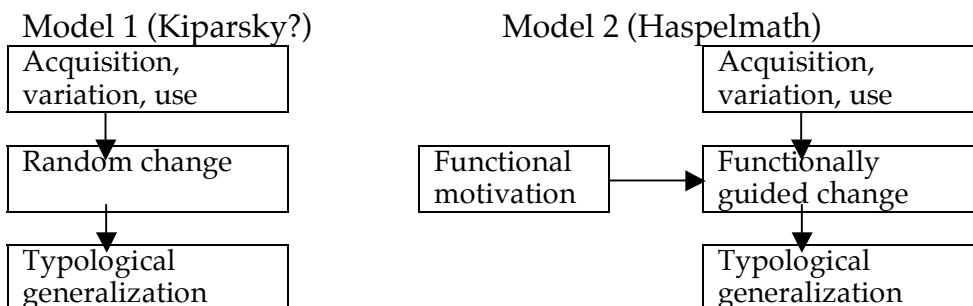
	1st/2nd	3rd	proper	human	inanimate
Lezgian	m	m	m	m	m
Dyirbal	–	m	m	m	m
Guugu Yimidhirr	–	–	m	m	m
Gumbainggir	–	–	–	m	m
Lakhota	–	–	–	–	m
Hungarian	–	–	–	–	–

Kiparsky 2004: argues extensively against Garrett's (1990) proposal that "NP-split ergativity" (=differential use of overt ergative case only for lower NP types) has a **purely diachronic explanation**

"All diachronic roads lead to the same synchronic Rome, where ergative case is lacks a morphological mark in high-D nominals. Far from explaining this syncretism pattern, the various changes themselves **require a motivation for the pattern as part of their explanation**. The "invisible hand" of historical evolution nudges morphological systems towards certain **optimal states**, and part of the job of **morphological theory** is to say what those states are...

Historical mechanisms by themselves cannot explain why languages undergo the particular kinds of reanalyses that result in split ergativity but not other, a priori equally imaginable kinds of reanalyses. The D-hierarchy must in some sense be part of the **design of language**. (Kiparsky 2004:§3.2)"

Two models of "change resulting in typological generalization":



"(continued:) The D-hierarchy is a linguistic universal and SHOULD be expressed in **the synchronic theory of grammar** because:

- (23)
- a. The hierarchy is inviolable.
 - b. There are multiple sources of split ergative case marking.
 - c. The hierarchy is a pathway of analogical change.
 - d. The hierarchy is manifested spontaneously in child language.
 - e. The hierarchy must be encoded in the grammar because it intersects with other hierarchies (notably definiteness) and because it plays a role in the distribution of other morphological categories (notably number and agreement)."

- the hierarchy is NOT inviolable (various exceptions have been noted to DOM and DSM)
- the hierarchy must be part of a ("synchronic") functional motivation (and in this sense perhaps part of the "design of language"), **but it need not be part of the cognitive code/Universal Grammar!**

References

- Aissen, Judith. 1999. "Markedness and subject choice in Optimality Theory." *Natural Language and Linguistic Theory* 17: 673-711.
- Aissen, Judith. 2003. "Differential object marking: Iconicity vs. economy." *Natural Language and Linguistic Theory* 21.3: 435-483.
- Bossong, Georg. 1985. *Differenzielle Objektmarkierung in den neuiranischen Sprachen*. Tübingen: Narr.
- Bossong, Georg. 1991. "Differential Object Marking in Romance and Beyond." In D. Wanner and D. Kibbee (eds.), *New Analyses in Romance Linguistics: Selected Papers from the XVIII Linguistic Symposium on Romance Languages, Urbana-Champaign, April 7-9, 1988*. Amsterdam: Benjamins, 143-170.
- Bossong, Georg. 1998. "Le marquage différentiel de l'objet dans les langues d'Europe". In: Feuillet, Jack (ed.) *Actance et valence dans les langues de l'Europe*. Berlin: Mouton de Gruyter, 193-258.
- Caldwell, Robert. 1856. *A comparative grammar of the Dravidian or South-Indian family of languages*. London: Harrison.
- Carnie, Andrew. 2005. "Some Remarks on Markedness Hierarchies: A Reply to Aissen 1999 and 2003." *Coyote Working Papers in Linguistics* 14. (available from <http://dingo.sbs.arizona.edu/~carnie/Pages/Papers.html>)
- Comrie, Bernard. 1977. 'Subjects and direct objects in Uralic languages: a functional explanation of case-marking systems'. *Études Finno-Ougriennes* 12 (1975): 5-17.
- Comrie, Bernard. 1981/1989. *Language Universals and Linguistic Typology*. Oxford: Blackwell.
- Croft, William. 1988. Agreement vs. case marking in direct objects. In Barlow, M. and Ferguson, C. A., editors, *Agreement in Natural Language: approaches, theories, descriptions*, pages 159-80. Stanford: CSLI.
- Croft, William. 2003. *Typology and universals*. 2nd ed. Cambridge: Cambridge University Press.
- de Hoop, Helen & Andrej Malchukov. 2005. "Case Marking Strategies." Paper presented at the Workshop on Recent Developments in OT Syntax & Semantics, Harvard University, 2 July 2005.
- Dixon, R.M.W. 1994. *Ergativity*. Cambridge: Cambridge University Press.
- Filimonova, Elena. 2005. "The noun phrase hierarchy and relational marking: problems and counterevidence." *Linguistic Typology* 9.1: 77-113.
- Garrett, Andrew. 1990. The Origin of NP Split Ergativity. *Language* 66: 261-296.
- Greenberg, Joseph. 1966. *Language Universals with Special Reference to Feature Hierarchies*, Mouton, The Hague.
- Haspelmath, Martin. 2002. *Understanding morphology*. London: Arnold.
- Haspelmath, Martin. 2003. "Against iconicity and markedness". Handout of talk at Stanford University, 6 March 2003.
- Haspelmath, Martin. 2006. "Against markedness (and what to replace it with)". To appear in *Journal of Linguistics* 42.1
- Jäger, Gerhard. 2004. "Learning constraint sub-hierarchies: The Bidirectional Gradual Learning Algorithm." In R. Blutner & H. Zeevat (eds.), *Pragmatics in OT*. Palgrave MacMillan, 251-287

- Jäger, Gerhard. 2005+. "Evolutionary Game Theory and Typology. A Case Study." Unpublished, available from <http://www.uni-bielefeld.de/lili/personen/gjaeger/>
- Jakobson, Roman. 1939. 'Signe Zéro', *Melanges de Linguistique Offerts à Charles Bally sous les Auspices de la Faculté des Lettres de L'université de Genève por des Collegues, des Confrères, des Disciples Reconnaissants, Georg et cie, s.a., Genève.*
- Kiparsky, Paul. 2004+. "Universals constrain change, change results in typological generalizations." Stanford University.
- Lazard, Gilbert. "Le marquage différentiel de l'objet." In: Haspelmath, Martin et al. (eds.) *Language typology and language universals: an international handbook*. Vol. II. Berlin: de Gruyter, 873-85.
- McCarthy, John J. 2002. *A thematic guide to Optimality Theory*. Cambridge: Cambridge University Press.
- Morimoto, Y. & P. de Swart. 2005. "Modelling Synchrony and Diachrony of Differential Object Marking." Paper presented at the Workshop on Recent Developments in OT Syntax & Semantics, Harvard University, 2 July 2005.
- Silverstein, Michael. 1976. "Hierarchy of features and ergativity." In: Dixon, R.M.W. (ed.), *Grammatical categories in australian languages*, 112-171. Canberra: Australian Institute of Aboriginal Studies.
- Thompson, Alexander. 1909/1912. "Beiträge zur Kasuslehre I/IV." *Indogermanische Forschungen* 24:293-307/30:65-79.
- Zeevat, Henk & Gerhard Jäger. 2002. "A reinterpretation of syntactic alignment." In D. de Jongh, H. Zeevat and M. Nilsenova (eds.), *Proceedings of the 3rd and 4th International Symposium on Language, Logic and Computation*. Amsterdam: ILLC. (available from: <http://www.uni-bielefeld.de/lili/personen/gjaeger/>)