Argument linking types for transitive verbs
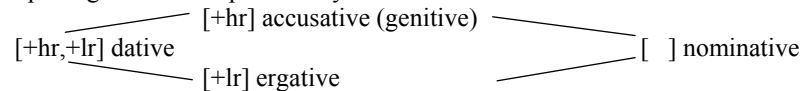
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Introduction: state of the art

a. Abstract case has been assumed a universal feature determining the way in which the arguments of a predicate are realized morpho-syntactically.
   - morphologically:
     either on the head (clitics, pronominal affixes, agreement morphemes)
     or on the dependent (morphological case),
   - syntactically: by position with respect to the predicate expression.

b. In Lexical Decomposition Grammar (LDG), abstract case is encoded by means of two relational features associated with theta-roles (= λ-abstractors for argument variables) (i.e., [+hr] 'there is a higher role', [+lr] 'there is a lower role') – either based on the semantic hierarchy of arguments (unmarked), or assigned lexically ('lexical case'). [See work by Wunderlich, Stiebels, Joppen, and others]

   Morphological case is specified by the same features:

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                  ——— [+hr] accusative (genitive) ———
   [+hr,+lr] dative                                      [   ] nominative
                  ——— [+lr] ergative ———
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   This allows a correspondence-theoretical analysis

intransitive	transitive		ditransitive		
λx DANCE(x)	λy	λx HIT(x,y)	λz	λy	λx {ACT(x) & BEC POSS(y,z)}
λx FALL(x)	λy	λx LIKE(x,y)	λz	λy	λx {ACT(x) & SEE(y,z)}
−hr	+hr	−hr	+hr	+hr	−hr
−lr	−lr	+lr	−lr	+lr	+lr
NOM	ACC	NOM	ACC	DAT	NOM
NOM	NOM	ERG	NOM	DAT	ERG

   - **Generalized case**: no important distinction is made between morphological case and morphemes realized on the head– all of these can be characterized as DAT, ERG/ACC, or NOM. [Kiparsky 1992, Wunderlich 1997]
   - Generalized case is a <u>purely structural device</u>, independent of semantic role.
   - <u>Typological variation</u>: some languages exhibit ACC, others ERG, some have an ACC-ERG split; languages that lack DAT may vary with respect of how they realize the medial argument (if at all). [Stiebels 2000]
   - <u>Lexical marking</u>: overrides argument hierarchy (often motivated semantically) by assigning the features [+hr] or [+lr] to semantic classes or individual items.
       [+hr] for the highest role induces DAT (experiencer verbs).
       [+lr] for the lowest role induces DAT (
   Many more lexical cases in German and Icelandic. [Wunderlich 2000]

c. Positional type of argument linking
   - Last resort universally: The syntactic ordering of complement NPs reflects the argument hierarchy, with the highest argument first and the lowest argument last.
   - Restricted positions   Symmetric objects (Kichaga, Sesotho)

[−hr]	V	[+hr]		[−hr]	V	[+hr]	[+hr]
Subj		Obj		Subj		Obj	Obj

     Asymmetric objects (Chichewa, Kikuyu, Chinese, English):

[−hr]	V	[+hr]	[+hr, +ho]
Subj		primO	secO

     = restricted object in Lexical Mapping Theory (Bresnan)
   - Differs from the generalized case type, where the medial argument is more marked than the lowest one (namely by DAT); here, it is less marked (becomes subject under passive).

<u>**Claim**</u>: There are more argument linking types than 'generalized case' and 'positional linking'. Contrary to the assumptions of many theories of grammar, neither of these types themselves belong to UG. - UG only incorporates the idea of relational predicates whose arguments are ordered. All linking types are invented by cultural evolution, on the basis of some universal factors:
   - Semantic roles (proto-agent, proto-patient)
   - Salience of arguments (person: 1, 2 > 3, number: pl, du > sg, animacy: +anim > −anim , specificity: +spec > −spec)
   - Hierarchy of arguments

Grammatical relations such as 'subject' cannot serve for typological needs. 'Subject' can be the highest argument (semantically), the nominative argument (morphologically), or the argument designated for SpecI (syntactically).

Among the constraints for the realization of arguments are the following:
   - Mark person.
   - Mark number.
   - Avoid converse settings to be identically marked. (The most important subcase of 'Avoid ambiguity'.)

'direct' setting			'inverse' setting		
λy	λx	VERB(x,y)	λy	λx	VERB(x,y)
3	1		1	3	

1. Portmanteau type (rare in its pure form, uneconomical): Affixes on the verb specify both arguments simultaneously.

Notation: x→y, with x being the higher and y the lower argument.

(1)   Single portmanteau-suffixes

Hungarian	-lak/-lek	1sg→2
Ayacucho and Cuzco Quechua	-yki	1→2
Dumi (Kiranti language in Nepal)	-n	1sg→2
[van Driem 1993]	-u	1sg→3

(2)   Portmanteau-prefixes in Kiowa (Tanoan pueblos of New Mexico and Arizona)
        [Laurel Watkins 1984]
    a. èm-góp // é-góp // dɔ́-góp // gɔ̀-góp
        pref-hit
        I hit you/him // you/he hit me // you/he/they hit us // we/he/they hit you(sg)
            èm   <1sg → 2 ∨ 3sg>
            é   <2 ∨ 3sg → 1sg>
            dɔ́   <2 ∨ 3 → 1pl>
            gɔ̀   <1pl ∨ 3 → 2sg>
    b. k'ɔ̂   é-ɔ́   // kút   né-ɔ́ / yá-ɔ́
        knife pref-give // book pref-give
        you/he gave me a knife / two books / some books
            é   <2 ∨ 3sg/ 1sg/ sg ∨ ∅>
            né   <2 ∨ 3sg/ 1sg/ dl>
            yá   <2 ∨ 3sg/ 1sg/ pl>
    c. k'ɔ̂   gyá-ɔ́   // kút   nén-ɔ́/ yán-ɔ́/
        knife pref-give // book pref-give
        I gave you/him a knife / two books / some books
            gyá   <1sg/ 2 ∨ 3sg/ sg>
            nén   <1sg/ 2 ∨ 3sg/ dl>
            yán   <1sg/ 2 ∨ 3sg/ pl>
    d. k'ɔ̂   bâ-ɔ́   // kút   bédê-ɔ́ / bágî-ɔ́
        knife pref-give // book pref-give
        you (pl.) gave me/us/him a knife/two books/some books
            bâ   <2pl/ 1 ∨ 3sg/ sg>
            bédê   <2pl/ 1 ∨ 3sg/ dl>
            bágî   <2pl/ 1 ∨ 3sg/ pl>
    e. k'ɔ̂   â-ɔ́   // kút   dê-ɔ́ / gyâ-ɔ́
        knife pref-give // book pref-give
        they gave me/us/him a knife/two books/some books
            â   <3pl/ 1 ∨ 3sg/ sg>
            dê   <3pl/ 1 ∨ 3sg/ dl>
            gyâ   <3pl/ 1 ∨ 3sg/ pl>

k'ɔ̂ is a class I noun (inherently sing.), kút is a class II noun (inherently dual/plural).
Note: Watkins derives the shape of prefixes from an underlying form (intransitive prefix + agent/patient role + number of inanimate object) by a series of phonomorphological rules.

2. Active type (e.g. Carib languages): Affixes on the verb specify for the more salient argument whether it is active (agent-like) or inactive (patient-like); the same affixes are used for intransitive verbs. [Problems in the classification of verbs]

(3)   Dekwana (Carib, Hall 1988, cited from Derbyshire 1999:34/35)
    a. w-edant(ö)-a.   b. y-edant(ö)-a.
        1.ACT-meet-PRES   1.INACT-meet-PRES
        'I meet him/her.'   'He/she meets me'
    c. w-amo-a.   d. y-a:wo-a.
        1.ACT-cry-PRES   1.INACT-swell-PRES
        'I am crying.'   'I am swelling.'

Transitive verbs   Intransitive verbs
direct setting   *inverse setting*
λy   λx   V(x,y)   λy   λx   V(x,y)   λy V(y)   λx V(x)
3   1   1   3   1   1
     ACT   INACT   INACT   ACT

3. Salience type (e.g. Tanoan languages): Affixes on the verb specify the more salient argument; some affixes also specify whether a more salient argument is added to the verb.

(4)   Arizona Tewa has seven distinct sets of person prefixes (Kroskrity 1985)

	1sg	1du	1pl	2sg	2du	2pl	3sg	3du	3pl
STAT	'o-	ga-	gi-	'u-	da-	'i-	na-	da-	di-
POSS	dín-	gáh-	gíh-	'úh-	déh-	'óh-	'u:-	dén-	dó:
REFL	déh-	'an	'íbi-	bi-	den-	'óbí-	'i-	den-	díbí-
BEN	??								
AGT	dó-	'án-	'í:-	ná:-	den-	'obí:n-	mán-	den-	dí:-
PAT				wó:-	wó:bén-	wó:bé-	'o:-	'o:bén-	'o:bé-

Two portmanteaus: PAT   wí- <+1/+2>
                      dí- <−1,+1>

(5)   a. STAT   λx VERB(x)
      b. POSS   λy λx {VERB(x) & POSS(y,x)}
          A possessor is more salient than the possessed.
      c. REFL   λx VERB(x,x)
      d. BEN   λz λy λx {VERB(x,y) & POSS(z,y)}
          A newly introduced argument is more salient than all others
      e. AGT   λy λx VERB(x,y)
                       3
          Agents are more salient than 3rd person patients
      f. PAT   λy   λx VERB(x,y)
                    3(obl)
          But patients (in particular those being 1,2) can be more salient than agents.
          The less salient syntactic argument must be marked oblique.

(6) Arizona Tewa
    a. semele   dín-han
       pot   1sg.POSS-break
       'My pot broke'
    b. he'i-n   sen-en   dó-k^{hw}έdi
       this-pl   man-pl 1sg.AGT-hit
       ' I hit these men'
    c, he'i-n   sen-en-di dí-k^{hw}έdi
       this-pl   man-pl-OBL 1sg.PAT-hit
       'These men hit me'
    d. nέ'i-n   'ayú-n 'o:'i-n 'enú-n-di 'ó:bé- k^{hw}έdi
       this-pl   girl-pl   that-pl boy-pl-OBL 3pl.PAT-hit
       'Those boys hit these girls'
    e. na:'in   dí-k'ú:wá-mέgí
       we   1.PAT-sheep-give
       'we were given sheep (by you or some third person)'
    f. 'u-n   na:di wí-k'ú:wá-mέgí
       you-pl I-obl 1.AGT/2.PAT-sheep-give
       'You (pl.) were given sheep (by me)

At the other ~~extreme.~~ purely structural in syntax.

4. Positional type (e.g. Bantu languages): The argument hierarchy is mapped to syntactic positions, with the highest argument first and the lowest argument last. [This is also the last resort of all other types.]

(7)	λz	λy	λx VERB(x,y,z)	Syntactic positions :
symm. objects	+hr	+hr	−hr	[−hr] – V – [+hr] – [+hr]
asymm. objects	+ho			[−hr] – V – [+hr] – [+hr,+ho]
LMT (Bresnan)	+o	+o	−o	
	+r	−r	−r	

Symmetrical object languages (Kichaga, Kinyarwanda, Marathi, Sesotho)
Salience plays a role: animates < inanimates

(8) Sesotho (Lee 2000)
    Sello o-shap-el-a   Lineo bashanyana. / bashanyana Lineo.
    Sello I.SBJ-beat-APPL-FV Lineo boys
    i. 'Sello beats the boys for Lineo.'
    ii. 'Sello beats Lineo for the boys.'
(9) a. Morena ó-bítsel-íts-o-é   baná.
       chief   I.SBJ-call-APPL-PASS-PAST children
    b. Baná   ba-bítsel-íts-o-é   morena.
       children II.SBJ-call-APPL-PASS-PAST chief
    i. 'The children benefitted from having the chief called.'
    ii. 'The chief benefitted from having the children called.'

Alternating asymmetrical object languages (Kikuyu, Lee 2000)
Salience does not play any role.
(10)   a. Karioki ɔ:n-ε-irε   gari dereba.
       Karioki SBJ.find-APPL-PAST car driver
       'Karioki found a driver for the car.'
    b. Karioki ɔ:n-ε-irε   dereba gari.
       Karioki SBJ.find-APPL-PAST driver car
       'Karioki found a car for the driver.'
(11) Alternating passive is possible if the semantic roles of the participants
     can be uniquely determined:
    a. Moarimo ne-a-hε-ir-uɔ   ihoa   ne mo:do.
       teacher   FOC-SBJ-give-PAST-PASS flower by man
       'The teacher was given the flower by the man.'
    b. Ihoa   ne-re-hε-ir-uɔ   moarimo   ne mo:do.
       flower   FOC-SBJ-give-PAST-PASS teacher   by man
       'The flower was given to the teacher by the man.'
Nonalternating asymmetrical object languages (Chicheŵa, Swahili)

5. Inverse type (Algonquian languages): Affixes on the verb encode whether the higher or the lower argument is more salient (direct vs. inverse marker), i.e. relative salience is assigned in the context of argument hierarchy. [Computationally, this is the most complex type because it maps two hierarchies onto each other.]

(12) Plains Cree (Wolfart 1981, Fabri 1996)
    a. Ni-seekih-aa-naan   atim.
       1-scare-DIRECT-1pl dog
       'We scare the dog'
    b. Ni-seekih-iko-naan atim.
       1-scare-INVERSE-1pl dog
       'The dog scares us'

Corollaries:
1. Salience must be made explicit in every transitive setting (a disadvantage).
    a. 1→2 and 2→1 cannot be expressed alike, one person must be the higher one.
       Algonquian: a further pair of direct/inverse voice markers (with 2 > 1) is introduced. [replaces portmanteaus]
    b. In the setting 3→3 (where both are human or animate), one person must be the lower one (the obviative), so that 3→3obv and 3obv→3 can be distinguished. (Under certain circumstances, 3obv→3obv is allowed, but never *3→3.) The less salient argument is marked by obviative in such a case.

(13) Local person in Plains Cree:
    a. ki-waapam-i-naan   'We see you (sg/pl)'
       2-see-DIRECT-1pl
    b. ki-waapam-i-naan   'You (sg/pl) see us'
       2-see-INVERSE-1pl

(14) Obviative in Plains Cree (Wolfart 1981:30)
    a. waapam-**eew** naapeew siisiip-**a**   'The man sees the duck (obv)'
       see-DIRECT   man   duck-OBV
    b. waapam-**ik**   naapeew siisiip-**a**   'The duck (obv) sees the man'
       see-INVERSE man   duck-OBV
    c. waapam-**eew** naapeew-**a** siisiip   'The duck sees the man (obv)'
       see-DIRECT   man-OBV duck
    d. waapam-**ik**   naapeew-**a** siisiip   'The man (obv) sees the duck'
       see-INVERSE man-OBV duck

(15) a.   *direct setting*   *inverse setting*

$$\begin{array}{llll} \lambda y & \lambda x & \text{VERB}(x,y) & \lambda y \quad \lambda x \quad \text{VERB}(x,y) \\ +hr & +lr & & +hr \quad +lr \\ 3obv & 3 & & 3 \quad\;\; 3obv \\ +hs & & & \qquad\;\; +hs \\ \text{DIRECT} & & & \text{INVERSE} \end{array}$$

    b. Obviative marking on the lower syntactic argument may get reinterpreted as accusative case on independent nouns.

2. The reference to person (rather than abstract case) allows reference-tracking across clause boundaries (especially when obviative marking is involved). [Can be reinterpreted as 'same subject' vs. 'different subject'.]

(16) Coreference with a possessor in Plains Cree (Wolfart 1981: 26)
    Note the difference between *o-stees-a* 'his older brother$_{obv}$' and *o-stees-iýiw* 'his$_{obv}$ older brother'. prox(imate) indicates the non-obviative person.
    a. caan waapam-eew   o-stees-a   w-iik-ihk
       John see-DIRECT   [3-brother]-OBV 3-house-at
       'John$_{prox}$ saw his$_{prox}$ older brother$_{obv}$ at his$_{prox}$ house'
    a. caan waapam-eew   o-stees-a   w-iik-**iý**-ihk
       John see-DIRECT   [3-brother]-OBV 3-house-OBV.POSS-at
       'John saw his older brother$_{obv}$ at his$_{obv}$ house'

(17) Coreference with an arg. of the dependent clause in Plains Cree (Wolfart: 26)
    a. naapeew   atimw-a   waapam-eew ee-sipweehtee-t
       man   dog-OBV   see-DIRECT   CONJUNCT-leave-3
       'The man$_{prox}$ saw the dog as he$_{prox}$ left'
    b. naapeew   atimw-a   waapam-eew ee-sipweehtee-**yi**t
       man   dog-OBV   see-DIRECT   CONJUNCT-leave-3OBV
  'The man saw the dog$_{obv}$ as he$_{obv}$ left'

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6. Generalized case type (predominant): Affixes on the verb, as well as morphological cases on the complement, encode argument hierarchy. It is possible to encode argument hierarchy in the context of salience values (split case).
[This is the most effective type: It is structural but does not need to map hierarchies onto each other.]

A precise definition can be given for the following notions.
- Structural case: realizes features of argument hierarchy ([+hr] 'there is a higher role', [+lr] 'there is a lower role').
- Lexical case: realizes the same type of features, which, however, are lexically assigned (often motivated semantically) rather than licensed by argument hierarchy.
- Semantic case: realizes arguments in an adjunct-like way by adding a semantic relation that characterizes the semantic role.

The relevant constraints follow from the harmonic alignment of scales (Prince & Smolensky 1993, Stiebels 2000a/b; Aissen 1999a for a different account).

(18) Fundamental asymmetry. The direct setting is more natural than the inverse setting because local person tends to be an agent. Therefore, the inverse setting is more likely to be marked morphologically.

(19) Harmonic alignment for generalized case:
    a. +hr > +lr   Morphological marking by [+hr] is more effective than that by [+lr].
       +loc > −loc   Person hierarchy (1 > 3)

    b. Case in the context of person values
       +hr/+loc ≻ +hr/−loc
       +lr/−loc ≻ +lr/+loc

    c. Markedness hierarchies
       *(+hr)/−loc » *(+hr)/+loc   Accusative for a 3rd person is more marked (less likely) than accusative for the 1st person.
       *(+lr)/+loc » *(+lr)/−loc   Ergative for the 1st person is more marked (less likely) than ergative for a 3rd person.

The **Split case type** reflects the fact that only inverse settings must be marked.

direct setting		*inverse setting*		*intransitives*
λy λx VERB(x,y)		λy λx VERB(x,y)		λx VERB(x)
+hr +lr		+hr +lr		−hr,−lr
3 1		1 3		1
NOM		ACC ERG		NOM

(20) **Straits Salish** is rather near to this ideal type of split case (Jelinek & Demers 1994)

NOM clitics		ACC suffixes		ERG suffixes		POSS affixes	
1sg	=sən	local	-oŋəs	3	-(ə)s	1sg	nə-
2sg	=sxʷ	1pl	-oŋəɬ			2sg	'ən-
1pl	=ɬ	refl	-oŋət			1pl	-ɬ
2pl	=sxʷhelə					-	-(ə)s

(21) However, ACC and ERG cannot be combined in one verb form of Straits Salish:
   a. kʷəniŋ-t -oŋəs =lə =sən   'I helped you'
       help-TRANS -loc.ACC =PAST =1.NOM
   b. kʷəniŋ-t =lə = sən   'I helped him'
       help-TRANS =PAST =1.NOM
   c. kʷəniŋ-t -s =lə   'He helped him'
       help-TRANS -3.ERG =PAST
   d. * kʷəniŋ-t -oŋəs -əs =lə   'He helped me'
       help-TRANS -loc.ACC -3.ERG=PAST
   e. kʷəniŋ-t -ŋ =lə =sən   'I was helped'
       help-TRANS -PASS =PAST =1.NOM
   All inverse settings with a local person must be expressed in the passive (possibly because only one personal suffix can follow the verb).

Analysis of the inverse type

The **Inverse type** encodes the salience hierarchy in a transitive verb (rather than using salience values as the context for case). Conversely to split case, salience is here realized in the context of abstract case. This ingenious solution in its pure form is only found in the Algonquian languages (but with many lexicalized forms, especially in the dependent, so-called conjunct clauses).

    a. Salience features: [+hs] 'there is a more salient argument'
                       [+ls] 'there is a less salient argument'
   b. Direct voice: [+hs]/+hr   or   [+ls]/+lr   (=harmonic alignment)
       Inverse voice: [+hs]/+lr   or   [+ls]/+hr   (=disharmonic alignment)

(22) Harmonic alignment for the inverse type:
   a. +ls > +hs   Salience hierarchy (1 > 3)
       +hr > +lr   The morphological marking by [+hr] is more
                      effective than that by [+lr].
   b. Salience in the context of abstract case
       +ls/+hr ≻ +ls/+lr
       +hs/+lr ≻ +hs/+hr

    c. Markedness hierarchies
       *(+ls)/+lr » *(+ls)/+hr   Direct voice is more marked (less likely) than
       *(+hs)/+hr » *(+hs)/+lr   indirect voice.
   d. A language with both direct and inverse markers:
           Max(+ls) » *(+ls)   or   Max(+hs) » *(+hs)
       A language with inverse marker only:
           *(+ls)/+lr » Max(+ls)   or   *(+hs)/+hr » Max(+hs)

Summary

Universally, two scales are relevant for argument linking. The way in which these scales are used offers three typological options:

    1. Inverse type: both salience and argument hierarchy are relevant;
             no generalization regarding one of these

'direct' setting			'inverse' setting		
λy	λx	VERB(x,y)	λy	λx	VERB(x,y)
3	1		1	3	
+hr	+lr		+hr	+lr	
+hs	+ls		+ls	+hs	
DIRECT			INVERSE		

    2. Salience type: generalization of salience
           in the context of argument hierarchy

'direct' setting			'inverse' setting		
λy	λx	VERB(x,y)	λy	λx	VERB(x,y)
3	1		1	3	
+hr	+lr		+hr	+lr	
AGENT			PATIENT		

    3. Generalized case type: generalization of argument hierarchy
           in the context of salience

'direct' setting			'inverse' setting		
λy	λx	VERB(x,y)	λy	λx	VERB(x,y)
3	1		1	3	
+hr	+lr		+hr	+lr	
			ACC	ERG	

Note: Contrary to what many researchers assume, semantic roles (such as proto-agent and proto-patient) are relevant for the shape of individual predicates (agents tend to be the highest argument, patients tend to be the lowest argument), but less relevant for argument linking itself.