Argument linking types for transitive verbs

Dieter Wunderlich (Düsseldorf) – SFB-Kolloquium Köln, 18. Mai 2001

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:

\[ [+hr] \text{ accusative (genitive)} \]
\[ [+lr] \text{ dative} \]
\[ [+] \text{ nominative} \]

This allows a correspondence-theoretical analysis

<table>
<thead>
<tr>
<th>Intransitive</th>
<th>Transitive</th>
<th>Ditransitive</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \lambda x \ \text{DANCE}(x) )</td>
<td>( \lambda y \ \lambda x \ \text{HIT}(x,y) )</td>
<td>( \lambda z \ \lambda y \ \lambda x \ { \text{ACT}(x) &amp; \text{BEC POSS}(y,z) } )</td>
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<tr>
<td>( \lambda x \ \text{FALL}(x) )</td>
<td>( \lambda y \ \lambda x \ \text{LIKE}(x,y) )</td>
<td>( \lambda z \ \lambda y \ \lambda x \ { \text{ACT}(x) &amp; \text{SEE}(y,z) } )</td>
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- 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 purely structural device, independent of semantic role.
- Typological variation: some languages exhibit ACC, others Erg, some have an ACC-ERG split; languages that lack DAT may vary with respect to how they realize the medial argument (if at all). [Stiebels 2000]
- Lexical marking: 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])

Claim: 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 Spec1 (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’.)

<table>
<thead>
<tr>
<th>‘direct’ setting</th>
<th>‘inverse’ setting</th>
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</thead>
<tbody>
<tr>
<td>( \lambda y \ \lambda x \ \text{VERB}(x,y) )</td>
<td>( \lambda y \ \lambda x \ \text{VERB}(x,y) )</td>
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</tbody>
</table>
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

<table>
<thead>
<tr>
<th>Hungarian</th>
<th>-lak/-lek</th>
<th>1sg→2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aymara</td>
<td>-yt</td>
<td>1→2</td>
</tr>
<tr>
<td>Dumi (Kiranti)</td>
<td>-n</td>
<td>1sg→2</td>
</tr>
<tr>
<td>[van Driem 1993]</td>
<td>-u</td>
<td>1sg→3</td>
</tr>
</tbody>
</table>

(2) Portmanteau-prefixes in Kiowa (Tanoan pueblos of New Mexico and Arizona) [Laurel Watkins 1984]

a. em-góp / e-góp / dā-góp / gā-góp
   pref-hit
   I hit you/him / you/he/they hit us / we/he/they hit you(sg)
   ëm <1sg→2 v 3sg>
   dā <2 v 3sg→1pl>
   gā <1pl v 3→2sg>

b. k’ā e-ð / kūt né-ð / yá-ð
   knife pref-give / book pref-give
   you/he gave me a knife / two books / some books
   ë <2 v 3sg/1sg v ë> ==
   né <2 v 3sg/1sg v dl>
   yá <2 v 3sg/1sg v pl>

c. k’ā gyá-ð / kūt nén-ð / yán-ð
   knife pref-give / book pref-give
   I gave you/him a knife / two books / some books
   gyá <1sg→2 v 3sg>
   nén <1sg→2 v 3sg v dl>
   yán <1sg→2 v 3sg v pl>

d. k’ā bā-ð / kūt bēðē-ð / bāgī-ð
   knife pref-give / book pref-give
   you (pl.) gave me/us/him a knife/two books/some books
   bā <2pl/1 v 3sg/sg> ==
   bēðē <2pl/1 v 3sg/v dl>
   bāgī <2pl/1 v 3sg/v pl>

e. k’ā ā-ð / kūt dē-ð / gyā-ð
   knife pref-give / book pref-give
   they gave me/us/him a knife/two books/some books
   ã <3pl/1 v 3sg/sg>
   dē <3pl/1 v 3sg/v dl>
   gyā <3pl/1 v 3sg/v pl>

k’ā is a class I noun (inherently sing.), kūt 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-amo-a.
   1.ACT-cry-PRES   1.INACT-swell-PRES
   'I am crying.'     'I am swelling.'

Transitive verbs

<table>
<thead>
<tr>
<th>direct setting</th>
<th>inverse setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>λy λx V(x,y)</td>
<td>λy V(y) λx V(x)</td>
</tr>
<tr>
<td>3 1</td>
<td>1 3</td>
</tr>
<tr>
<td>ACT</td>
<td>INACT</td>
</tr>
<tr>
<td>INACT</td>
<td>ACT</td>
</tr>
</tbody>
</table>

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)

<table>
<thead>
<tr>
<th></th>
<th>1sg</th>
<th>1du</th>
<th>1pl</th>
<th>2sg</th>
<th>2du</th>
<th>2pl</th>
<th>3sg</th>
<th>3du</th>
<th>3pl</th>
</tr>
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<tbody>
<tr>
<td>STAT</td>
<td>'o-'</td>
<td>ga-</td>
<td>ge-</td>
<td>u-</td>
<td>da-</td>
<td>'l-</td>
<td>na-</td>
<td>da-</td>
<td>dl-</td>
</tr>
<tr>
<td>POSS</td>
<td>din-</td>
<td>gah-</td>
<td>gih</td>
<td>'uh-</td>
<td>déh-</td>
<td>'oh-</td>
<td>'u-</td>
<td>'dén-</td>
<td>dō-</td>
</tr>
<tr>
<td>REFL</td>
<td>dēh-</td>
<td>'án-</td>
<td>'bí-</td>
<td>'bi-</td>
<td>'den-</td>
<td>'óbí-</td>
<td>'i-</td>
<td>'dén-</td>
<td>dībí</td>
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<tr>
<td>BEN</td>
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<tr>
<td>AGT</td>
<td>dō-</td>
<td>'án-</td>
<td>'í-</td>
<td>'ná-</td>
<td>'den-</td>
<td>'óbi:n-</td>
<td>'mán-</td>
<td>'den-</td>
<td>dl-</td>
</tr>
<tr>
<td>PAT</td>
<td>wó-</td>
<td>wó:bén-</td>
<td>wó:bě-</td>
<td>'o:-</td>
<td>'bén-</td>
<td>'o:bé-</td>
<td></td>
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</tbody>
</table>

Two portmanteaus: PAT wí- ↔+1/+2> dl- ↔<1,+1>

(5) a. STAT λx VERB(x)

b. POSSESS λx {VERB(x) & POSS(y,x)}

A possessor is more salient than the possessed.

c. REFLEXIVE λx VERB(x,x)

d. BEN λy λx {VERB(x,y) & POSS(z,y)}

A newly introduced argument is more salient than all others

e. AGENT λy λx VERB(x,y)

3 Agents are more salient than 3rd person patients

f. PAT λy λx VERB(x,y)

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'í-n sen-en dò-khwédi
      this-pl man-pl 1sg.atg-hit
      ‘I hit these men’
   c. he'í-n sen-en-dí di-khwédi
      this-pl man-pl-oBL 1sg.pat-hit
      ‘These men hit me’
   d. né'í-n 'ayú-n 'o:nú-n-di 'óbê-khwédi
      this-pl girl-pl that-pl boy-pl-oBL 3pl.pat-hit
      ‘Those boys hit these girls’
   e. na'in di-k'ú:wá-m
      we 1PAT-sheep-give
      ‘We were given sheep (by you or some third person)’
   f. 'u-n na:di wi-k'ú:wá-m
      you-pl I-obl 1AGT/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 LSBJ-beat-APPL-FV Lineo boys
    i. ‘Sello beats the boys for Lineo.’
    ii. ‘Sello beats Lineo for the boys.’

(9) a. Morena ő-bítsel-its-o-é baná.
    chief LSBJ-call-APPL-PASS-PAST children
    ‘The children benefitted from having the chief called.’
    b. Baná ő-bítsel-its-o-é morena.
    children II LSBJ-call-APPL-PASS-PAST chief
    ‘The chief benefitted from having the children called.’

Alternating asymmetrical object languages (Kikuyu, Lee 2000)

Salience does not play any role.

(10) a. Karioki ő:n-e-ire gari dereba.
    Karioki SBH-find-APPL-PAST car driver
    ‘Karioki found a driver for the car.’
    Karioki SBH-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-he-ir-uó ihoa ne mo:do.
       teacher FOC-SBJ-give-PASS-PAST flower by man
       ‘The teacher was given the flower by the man.’
    b. Ihoa ne-re-he-ir-uó moarimo ne mo:do.
       flower FOC-SBJ-give-PASS-PAST teacher by man
       ‘The flower was given to the teacher by the man.’

Nonalternating asymmetrical object languages (Chichewá, 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.]

       1-scare-DIRECT-1pl dog
       ‘We scare the dog’
       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→obv and 3obv→3 can be distinguished.
      (Under certain circumstances, 3obv→3obv is allowed, but never *3→3.) The least 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  siissip-a  ‘The man sees the duck (obv)’
   see-DIRECT  man    duck-OBV
   b. waapam-ik naapeew  siissip-a  ‘The duck (obv) sees the man’
   see-INVERSE man    duck-OBV
   c. waapam-eew naapeew-a siissip  ‘The duck sees the man (obv)’
   see-DIRECT man-OBV duck
   d. waapam-ik naapeew-a siissip  ‘The man (obv) sees the duck’
   see-INVERSE man-OBV duck

(15) a. direct setting  inverse setting
   \( \lambda y \lambda x \text{VERB}(x,y) \)
   +hr  +lr  3obv  3
   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 \( o\text{-stees-a} \) ‘his older brother\( _{obv} \)’ and \( o\text{-stees-iyin} \)
‘his\( _{obv} \) older brother’, proximate indicates the non-obviative person.
   a. caan waapam-eew o-stees-a w-iik-ihk   John see-DIRECT [3-brother]-OBV 3-house-at
      ‘Johnprox saw hisprox older brother\( _{obv} \) at hisprox house’
   b. caan waapam-eew o-stees-a w-iik-iyihk  John see-DIRECT [3-brother]-OBV 3-house-iyihk
      ‘John saw his older brother\( _{obv} \) at his house’

(17) Coreference with an arg. of the dependent clause in Plains Cree (Wolfart: 26)
   a. naapeew atimw-a waapam-eew ee-sipweeehtee-t
      man dog-OBV see-DIRECT CONJUNCT-leave-3
      ‘The man\( _{pros} \) saw the dog as he\( _{pros} \) left’
   b. naapeew atimw-a waapam-eew ee-sipweeehtee-yit
      man dog-OBV see-DIRECT CONJUNCT-leave-3OBV
      ‘The man saw the dog\( _{obv} \) as he\( _{obv} \) left’

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).

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 \textbf{Split case type} reflects the fact that only inverse settings must be marked.

\hspace{1cm} \textbf{direct setting} \hspace{1cm} \textbf{inverse setting} \hspace{1cm} \textbf{intransitives}
\begin{align*}
\lambda y \lambda x \text{VERB}(x,y) & \lambda y \lambda x \text{VERB}(x,y) & \lambda x \text{VERB}(x) \\
+hr  & +lr & +hr  \\
3obv & 1 & 3obv & 1
\end{align*}
Straits Salish is rather near to this ideal type of split case (Jelinek & Demers 1994).

<table>
<thead>
<tr>
<th>NOM clitics</th>
<th>ACC suffixes</th>
<th>ERG suffixes</th>
<th>POSS suffixes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1sg =sän</td>
<td>local -ŋəs</td>
<td>3 -ŋí</td>
<td>1sg na-</td>
</tr>
<tr>
<td>2sg =sxʷ</td>
<td>1pl -ŋəf</td>
<td>2sg 'an-</td>
<td></td>
</tr>
<tr>
<td>1pl =ɨ</td>
<td>refl -ŋə</td>
<td>1pl -ɨ</td>
<td></td>
</tr>
<tr>
<td>2pl =sxʰhel</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

However, ACC and ERG cannot be combined in one verb form of Straits Salish:

a. kwınız-t -ŋəs =lə =sän 'I helped you'
   help-TRANS -LOC.ACC =PAST =1.NOM
b. kwınız-t =lə =sän 'I helped him'
   help-TRANS =PAST =1.NOM
c. kʷǝniŋ-t -s =lə 'He helped him'
   help-TRANS -3.ERG =PAST
d. * kʷǝniŋ-t -ŋəs -əs =lə 'He helped me'
   help-TRANS -LOC.ACC -3.ERG =PAST
e. kʷǝniŋ-t -ŋ =lə =sän '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)

### 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

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

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

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.