Incorporation beyond the object:
Interpretation and compositionality in polysynthesis

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1 Introduction

The interpretation of incorporation has gaps

We can fill those gaps with mediating relations

Whose necessity is evident when we look at non-object incorporation

These relations will help understand the structures requisite in complex verbs

The focus is on the Kiowa language of Oklahoma

Aim for breadth; more details in McKenzie (2019), McKenzie (2021)

2   The interpretation of incorporation is weakly compositional

The interpretation of incorporation is weakly compositional (Pirrelli 2002)

The meanings of the parts contribute to the meaning of the whole, but do not fully compose it.

Noun incorporation: A noun combines syntactically with a verb into a complex 'word' (Mithun 1984, Baker 1988)

(1)   Kalaallisut / West Greenlandic (Van Geenhoven 1998: 99)

Suluut **timmisartu+** liur –puq
S.ABS   **airplane+**   make–IND:INTR:3s

'Suulut made an airplane.'

(2)   a. $[\![timmisartu]\!] = \lambda x_e \lambda w_w.\ \text{airplane}(x)(w)$ $\langle e, wt \rangle$

       b. $[\![liur]\!] = \lambda x_e \lambda e_s \lambda w_w.\ \text{make}(x)(e)(w)$ $\langle e, \langle s, wt \rangle \rangle$

       c. $[\![timmisartu{+}liur]\!] =$
          $\lambda e_s \lambda w_w.\ \exists x [\ \text{airplane}(x)(w) = 1\ \&\ \text{make}(x)(e)(w) = 1\ ]$ $\langle s, wt \rangle$

NB: We'll say "noun incorporation" even though there is undoubtedly more structure than a simple root, at least in some languages (Farkas & de Swart 2003, Barrie & Mathieu 2016).

3 Sourcing the existential quantifier

Van Geenhoven 1998: Semantic Incorporation. The verb lexically shifts to one that takes a property as its argument.

(3)   a. $[\![\textit{timmisartu}]\!] = \lambda x_e \lambda w_w.\ \text{airplane}(x)(w)$ $\langle e, wt \rangle$

          b. $[\![\textit{liur}]\!] = \lambda \mathbf{f_{et}} \lambda e_s \lambda w_w.\ \exists x[\ \mathbf{f}(x)(w)\ \&\ \text{make}(x)(e)(w)\ ]$ $\langle et, \langle s, wt \rangle \rangle$

          c. $[\![\textit{timmisartu}+\textit{liur}]\!] =$

              $\lambda e \lambda w.\ \exists x[\ \text{airplane}(x)(w)\ \&\ \text{make}(x)(e)(w)\ ]$ $\langle s, wt \rangle$

Also for pseudo-incorporation: Farkas & de Swart (2003), Dayal (2011)

Incorporated nouns usually have the following properties:

· The noun is number-neutral if morphological singular

· It has low scope with respect to other quantifiers

· It is discourse transparent, introducing referents

However

· It closes off further modification and doubling

· it isn't likely in languages where IVs are open class

4 An alternate means of procuring a binder

Chung & Ladusaw 2006: Restrict. The noun conjoins with the verb (via range restriction).

(4) hayi gǎi +patgun si Carmen
who have+child DET Carmen
'Whose child is Carmen?' (lit. who child+has Carmen)

(5) a. $[\![patgun]\!] = \lambda x_e.$ child(x) $\langle e, t \rangle$
b. $[\![gǎi]\!] = \lambda x_e \lambda e_s.$ have(x)(e) $\langle e, st \rangle$
c. $[\![gǎi{+}patgun]\!] = \lambda x_e \lambda e_s.$ child(x) & have(x)(e) $\langle e, st \rangle$

· Does not require the lexicon

· Does not saturate the entity. Allows "doubling", where a full DP is used with NI.

· But: Does not offer a source for the $\exists$

· Assumption: every element in the semantics is mapped to by an element in the LF

5   The process needs more to it

These processes were developed for object incorporation.
Notwithstanding any formal composition problems,

they are empirically insufficient.

· Non-objects routinely incorporate – they need a thematic role

(6)   Mohawk (Mithun 2004: 7)

wak–	**kont'sher**+	rh	–on
1S.PAT–	**paint**+	coat–	STATIVE

'I have paint-coated it/painted it.'

· Some nouns are intensional – they need a world binder

(7)   Kiowa (field notes)

á=	**cául**$_*$+	è+	bà	–hèl
3EMPS=	**buffalo**+	hunt+	go.PFV–	HSY

'They went to hunt buffalo.'

5 The process needs more to it

· Sometimes they need both

(8) Kiowa (Watkins 1990: 417)

góm+	já̧gá	á=	dá̧umê	gàu	∅=	**báuláu**_*+	fà̧ulè
wind+grease	3SGS.3SGD=be.HSY	and.SS	3SGA.3SGO=**butter**+	eat:IPFV.HSY

'He had mentholatum and was eating it like butter.' *: tone lowered for rest of word

6   The gaps that need to be filled

There is also adverb incorporation and verb incorporation.

Semantically, these constructions are weakly compositional

They need pieces to fill in the gaps. For noun incorporation, those are:

- · an existential quantifier over entities   (often)
- · a thematic role or other relation   (often)
- · a quantifier over possible worlds (*i.e.,* a modal)   (sometimes)

Intuitively that makes sense: Incorporation is often modeled such that a nominal element lacking the necessary functional information in its own projections gets them from the verb's.

How does the verbal projection carry the nominal functional load?

7 Focus on non-object incorporation

This talk we focus on Kiowa language (kio)

- Endangered language of the Kiowa Tribe of Oklahoma
- Kiowa-Tanoan language (Harrington 1910, Hale 1967, Sutton 2014)
- native speakers in the dozens maybe, all elderly
- several hundred heritage speakers

Ideal for this study because Kiowa generally bars object incorporation (with certain exceptions)

(9) Compare the placement of the object *kɫ́u* 'shawl':

a. Belle àn **kɫ́u** ∅= ą̂umàu
   B.   HAB **shawl** 3SGA.3SGO=make.IPFV

   'Belle makes shawls.' (Adger et al. 2009)

b. *Belle àn ∅= **kɫ́u**$_*$+ ą̂umàu
   B.   HAB 3SGA.3SGO=**shawl**+ make.IPFV

kɫ́u 'shawl' triggers singular agreement

$_*$: tone lowered for rest of word

Meanwhile, non-objects incorporate routinely and productively.

8   Non-object incorporation

Non-object incorporation corresponds to a free form as well.

(10)   The free form requires a postpositive

     a.   **thópòt**$_*$**–cà** dè=   áu$_*$+   sàugà
         shade –**at**   1SG.REFL=awhile+sit down.PFV

        'I sat down in the shade for a while'

     b.   ***thópòt**   dè=   áu$_*$+   sàugà
        shade   1SG.REFL=awhile+sit down.PFV

(11)   The incorporated form cannot bear a postpositive

     a.   dè=   áu$_*$+   **thòpòt**$_*$+ sàugà
        1SG.REFL=awhile+**shade**+   sit down.PFV

        'I sat down in the shade for a while'

     b.   ***dè=**   áu$_*$+   **thòpòt**$_*$**–cà**+ sàugà
        1SG.REFL=awhile+**shade**–   **at**+ sit down.PFV

⇒ The thematic role expressed is the event's location

9 Some other thematic roles

A wide variety of roles are attested, including but not limited to:

role	Kiowa	gloss	English
instrument	tó_*+gòp	club+hit	'hit with a club'
goal	jò+bá–	house+go	'go home'
source	jó_*+zòn–	shoe+remove from	'take out of a shoe'
natural cause	góm+qâubè–	wind+fall over	'fall over from the wind'
vehicle/means	kâu_*+hò+chàn–	car+travel+arrive	'arrive by car'
source material	tháp+kàui_*+àum–	[deer+hide]+make	'make out of buckskin'
affected body part	ául_*+sò–	hair+brush	'brush x's hair'
similarity	màyí_*+àgà	woman+be sitting.SG/DU	'be sitting like a woman'
kin relation	fábì_*+qàu	brother+be lying.SG/DU	'be x's brother'
existential	sésè_*+sàul	arrowhead+be set.SG/DU	'have an arrowhead in it'

In line with long-standing observations of oblique or non-object incorporation (Spencer 1995, Mithun 2004, i.a.).

10 Mediating relation, alternative numeration

Q: How does a verbal complex provide the missing functional load?

A: A relation mediates between verb and noun

The relation (M_N) is hosted by a functional head inside the verb's projection, rather than by a dedicated head that projects adjuncts to the clause.

The difference begins in the numeration; instead of choosing P° to provide this information, the speaker chooses Z°.

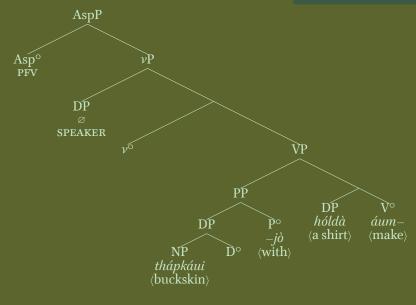We assume a base-generation account for the building of incorporates, at least for Kiowa.

(12)

PP
DP P°
NP D°
R

⇔

V°
Z° V°
N° Z°
M_N

11 Material in the nominal domain

(13) a. **tháp**+**káui**$_*$–**jò**   hóldà gàt=   ấumế
    deer+**hide** –**with**$_{inst}$ shirt 1sGA.3plO=make.pfv

   'I made a shirt with/out of buckskin.'

   hóldà 'shirt' is lexically pl

b.

```
                        AspP
                       /    \
                   Asp°      vP
                   PFV      /  \
                          DP    \
                          ∅      \
                       SPEAKER    \
                             \     \
                              v°    VP
                                   /  \
                                 PP    \
                                /  \    \
                              DP    P°   DP      V°
                             /  \   –jò  hóldà   áum–
                           NP   D°  ⟨with⟩ ⟨a shirt⟩ ⟨make⟩
                       thápkáui
                       ⟨buckskin⟩
```
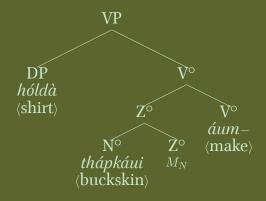
(14)   a.   hóldà   gàt= $\begin{bmatrix} \textbf{tháp} + \textbf{káui}_* + \\ \textbf{deer} + \textbf{hide} + \end{bmatrix}$ ằumề
           shirt   1SG.3PL=   make.PFV

       'I made a shirt with/out of buckskin.'

(15)

```
                              VP
                        ╱           ╲
                     DP               V°
                   hóldà          ╱       ╲
                  ⟨shirt⟩       Z°           V°
                             ╱    ╲        áum−
                           N°      Z°     ⟨make⟩
                        thápkáui   M_N
                        ⟨buckskin⟩
```

13 The mediating relation

(16) $⟦ M_N ⟧ = \lambda P_{ewt}\lambda e_s\lambda w_w.\ \exists y[\ P(y)(w) =1\ \&\ \text{ROLE}(y)(e)(w) =1\ ]$ $⟨⟨e, wt⟩, ⟨s, wt⟩⟩$

READ: *Given a property of entities, and event, and a world:*
There is an entity with that property playing a particular role in that event in that world

- The role is chosen contextually by the speaker. ROLE results from a choice function over the set of thematic roles.
- the selection is subject to semantic, pragmatic, and certain systematic exceptions that we will address

14 Composition with mediating relations

In the semantic interpretation, the noun is interpreted as an argument of M_N.

(17) $\qquad\qquad \lambda e_s \lambda w_w.\ \exists y[\ \text{buckskin}(y)(w)\ \&\ \textsc{Role}(y)(e)(w)\ ]$

$\qquad\qquad\qquad \lambda x \lambda w.\ \text{buckskin}(x)(w) \qquad [\![\ M_N\ ]\!]$

The result can conjoin with the verb through Event Identification (Kratzer 1996).

(18) $\qquad \lambda x_e \lambda e_s \lambda w_w.\ \text{make}(x)(e)(w)\ \&\ \exists y[\ \text{buckskin}(y)(w)\ \&\ \textsc{Role}(y)(e)(w)\ ]$

$\qquad \lambda e_s \lambda w_w.\ \exists y[\ \text{buckskin}(y)(w)\ \&\ \textsc{Role}(y)(e)(w)\ ] \quad \lambda x_e \lambda e_s \lambda w_w.\ \text{make}(x)(e)(w)$
$\qquad\qquad\qquad\qquad = (17)$

The structure requires a relation or it is uninterpretable, rather than ungrammatical.

15 Limits on thematic roles

Agents cannot be selected by ROLE. Cross-linguistically the norm, thought to derive from height.

(19) a. **qáhî** é= góp!
man 3SGA.1SGO=hit.PFV
'A man hit me!'

b. *é= **qáhî**$_*$+ gòp!
3SGA.1SGO=**man**+ hit.PFV

However, benefactive, comitatives, or recipients cannot be selected either (Barrie & Li 2015)

(20) Benefactive

a. **cóm** gáu= áumé
friend 1SGA:3INVO:3SGD=make.PFV
'I made it for a friend'

b. *gáu= **cóm**+ áumé
1SGA:3INVO:3SGD=**friend**+ make.PFV

INV: inverse number; here SG

15 Limits on thematic roles

(21) Receptive

    a. **cóm**   áu=   ậu   –jầu
        friend 3SGA:3INVO:3SGD=give.PFV–MOD.VT

        'She will give it to a friend.'

    b. *áu=   **cóm**+   ậu   –jầu
        3SGA:3INVO:3SGD=**friend**+ give.PFV–MOD.VT

(22) Comitatives employ conjunction anyways, let's set those aside.

    a. qậhî gàu **á**_*– **chàu**   –**dè** è=   chán
        man and **3P–mother**–BAS 3DU=arrive.PFV

        'A man came with his mother.'

> BAS: basic number; here SG

    b. *qậhî è=   **cháu**_*   chàn
        man 3DU=**mother**+ arrive.PFV

16   Limits to alternative numeration

Why agents, benefactives, and receptives? With NI, the thematic role is assigned by Z°, rather than by P°.

Rephrased: Why can't these roles be alternatively numerated ?

Answer: Features cannot be alternatively numerated on their own; only contentful heads can.

* * *

Barrie & Li (2015) suggest that the heads introducing these roles are linked to specific thematic roles, while a head like P° is not.

Agents are introduced by v° or Voice° which carries an agentive feature [AG], and assigns accusative case [ACC].

17   Restriction is not due to thematic restriction

But in Kiowa, benefactives and recipients are introduced by Appl° (Harbour 2003, 2008), along with possesors of objects, affected parties, the person you take something from, objects of locatives (like *tái* 'on top'), and even subjects of out-of-control constructions— none of which can be incorporated.

Appl° does affect argument structure; it's glossed as D 'dative' but applies to any of these roles.

(23) a. báɔ̀ **nèn**=   fàu+ câunmàu
          cat **1SGA:3DUO**= lead+bring.IPFV

          'I am bringing two cats.'

      b. báɔ̀ **mén**=   fàu+ câunmàu
          cat **1SGA:3DUO:2DUD**= lead+bring.IPFV

          'I am bringing you (2) guys two cats.'

18 Irreplaceable syntactic heads

Barrie & Li were on the right track: The way that a head provides thematic information matters.

A P° head carries lexical content that assigns a thematic role. The Z° head replaces this content.

v° and Appl° are dedicated to carrying thematic roles, but they are also generally devoid of overt content.

The heads are not alternatively numerated; their content is. There is no content in the heads besides the features themselves, yet those are linked to these heads.

(24)

NB: It may also matter that a.n.-able heads see their complements incorporated, while non-a.n. heads would see their specifiers incorporated

19   ...what about objects?

Kiowa generally disallows incorporation of objects.

Why? M_N allows choice, restricted if the role cannot be alternatively numerated.

If that is what blocks Theme, how would object incorporation ever work, much less be common?

Thus, object incorporation cannot involve M_N. We need a different mechanism.

To see what that is, look at Kiowa

Kiowa actually does allow object NI productively in some environments

These will show that another mechanism is at play

One where the mediating relation sits above the verb, rather than below it.

20   Kiowa allows object incorporation

Kiowa generally disallows object incorporation but does allow it very easily in three specific structural contexts.

1. Derived lexical items
2. when the incorporating verb is embedded in a nominal
3. when the incorporating verb is itself incorporated, in control-like structures

exception	Kiowa	gloss	English
derived lexical item	**ì**+xɔ́	offspring$_C$+put down.SG	'have a baby'
embedded in nominal	**són**$_*$+tà+qàudàl	grass+cut+vehicle	'lawn mower'
control-like	**káu**$_*$+àum+chàn	shawl+make+arrive	'come to make shawls'

Each of these independently requires a mediating relation

That relation can bind the entity argument

21 Exception 1: Derived lexical items

A number of expressions involve object incorporation with 'nameworthy' phenomena (Mithun 1984)

The verb still shows agreement from the object.

(25) ∅= **ì**+ xótjàu
 3SGA.3SGO=**offspring**_C+ put down.SG.IPFV
 'She is having a baby.' (Harrington 1928: 85)

(26) gàt= **é**+ zậuimàu
 1SGA.3PO=**bread**+ mash.IPFV
 'I am kneading the dough.'

There is no structural reason NI should work here and not with other cases.

But their 'nameworthiness' suggests that interpretation matters.

22   A verbal mediating relation

A mediating relation M_V takes the combined N+V and adds the quantifier.

N° can combine with the verb via Restrict or some other form of conjunction.

(27) $⟦ M_V ⟧ = \lambda P_{e,swt} \lambda e_s \lambda w_w. \exists y[\ P(y)(e)(w) = 1\ ]$ $⟨⟨e, swt⟩, ⟨s, wt⟩⟩$

$⟦ M_V [dough\,knead] ⟧ =\ \lambda e_s \lambda w_w. \exists y[\ dough(y)(w)\ \&\ knead(y)(e)(w)\ ]$

$⟦ M_V ⟧$ (via Restrict) : $⟨e, ⟨s, wt⟩⟩$
                              $\lambda y_e \lambda e_s \lambda w_w. dough(y)(w)\ \&\ knead(y)(e)(w)$

                    $\lambda x_e \lambda w_w. dough(x)(w)$ $\lambda y_e \lambda e_s \lambda w_w. knead(y)(e)(w)$

23   A categorizing head above the verb

M_V must be introduced by some syntactic head.

In this case, instead of a functional head that replaces P°, the head is categorizing.

As something becomes nameworthy, it becomes lexicalized. During the lexicalization process, a category head is added to the N+V complex.

(28)

```
                    V_b°
                  /      \
              V_b°        V_a°
              M_V        /    \
                       N°      V_a°
                       |        |
                     dough    knead
```

NB: This structure is built in the syntax, not the lexicon

Speakers can store these in the lexicon, not to build with, but to compare against

24   Exception 2: Verbs embedded within nominals

M_V can also be used with a nominalizing head

overt nominal compounds

é+qú$_*$+jò	bread+set down.PL$_C$+house	'granary, silo'
són$_*$+tà+qàudàl	grass+cut+vehicle	'lawn mower'
tháp+é$_*$+qì	deer+hunt+man	'deer hunter'

non-overt nominal compounds

chát$_*$+tè̀dà	door+remove$_C$	'key'
dàum+sá	ground$_C$+shatter	'plow'
háu$_*$+cù̀	metal+strike$_C$	'telegraph' (later 'telephone')

> Note the incorporated forms ($_C$), showing that there is some other head to the expression.

(29)

$$\text{N}_b°$$
$$\text{V}° \qquad \text{N}_b°$$
$$\text{N}_a° \qquad \text{V}° \qquad \varnothing_{\text{nom}}$$
$$M_V$$

chát   *hɛ́dè*
⟨door⟩   ⟨remove⟩

M_V is a complex relation in these cases. It has to take a verbal predicate, here the set of door-opening events, and provide a property of entities such that when the entity is used for its designed purpose, there are events with that predicate.

25   Decomposing complex relations

We can perhaps decompose this complexity at LF so that M_V quantifies over the entity argument, and the nominalizing $\varnothing_{\text{nom}}$ adds the modal component.

(30)   a. $[\![\varnothing_{\text{nom}}]\!] = \lambda P_{e,swt} \lambda x_e \lambda w_w. \forall w'[\ \text{Circ}(w)(w') \ \& \ x \text{ is used for its purpose in } w' \rightarrow \exists e'[\ \text{instrument}(x)(e')(w') \ \& \ P(e')(w')\ ]]$
READ: *In all circumstantial worlds where x is used for its purpose, there are events of P of which x is the instrument.*

b. $\lambda y_e \lambda w_w. \forall w'[\ \text{Circ}(w)(w') \ \& \ y \text{ is used for its purpose in } w' \rightarrow \exists e'[\ \text{instrument}(y)(e')(w') \ \& \ \exists x[\ \text{door}(x)(w') \ \& \ \text{open}(x)(e')(w')\ ]]]$

$[\![Z^\circ]\!] : \langle s, wt \rangle$
$\lambda e_s \lambda w_w. \exists x[\ \text{door}(x)(w) \ \& \ \text{open}(x)(e)(w)]$

$[\![\varnothing_{\text{nom}}]\!]$

$[\![N^\circ {+} V^\circ]\!] : \langle e, swt \rangle$
$\lambda x_e \lambda e_s \lambda w_w. \text{door}(x)(w) \ \& \ \text{open}(x)(e)(w)$

M_V

26 Exception 3: Verb under verb

A third exception that allows objects is when the verb is itself incorporated

(31) Recall that incorporating objects is generally rejected

    a. Màyóp   àn   **káu** á$_*$=   àumàu
      woman.INV HAB **shawl** 3EMPA.3SGO=make.IPFV

    'The ladies make shawls.'

INV: inverse number, here plural
EMP: empathetic plural

    b. *Màyóp   àn   á$_*$=   **kàu**+   àumàu
       woman.INV HAB 3EMPA.3SGO=**shawl**+ make.IPFV

(32) The same incorporation works if the verb is incorporated (32b)

    a. Màyóp   àn   **káu** á=   áum+ chánmà
      woman.INV HAB **shawl** 3EMPS=make+arrive.IPFV

    'The ladies come to make shawls.'

    b. Màyóp   àn   á=   **káu**$_*$+ àum+ chànmà
      woman.INV HAB 3EMPS=**shawl**+ make+arrive.IPFV

    'The ladies come to make shawls.'
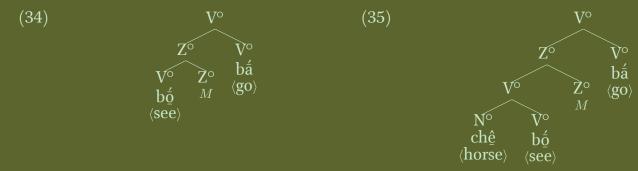
This structure is 'control-like' in meaning (but lacks PRO)

The incorporated verb does not show in the main verb's argument structure, and its event is intensional; true in worlds where the subject's intent comes true

(33) áuphầu   á=   **fɔ́**+ bắ,   né háun gáu=   bɔ́mâu
      out there 3EMPS=**see**$_c$+go.PFV but not   3EMPA.2SGO=see.NEG

      'They went there to see you, but they didn't see you.'

The incorporated verb does not share a world or event argument with the main verb →
mediating relation (M) between them. This can bind an incorporated noun (35)

(34)

```
              V°
             /  \
           Z°    V°
          /  \   bá
        V°   Z°  ⟨go⟩
        bɔ́   M
       ⟨see⟩
```

(35)

```
                    V°
                   /  \
                 Z°    V°
                /  \   bá
              V°   Z°  ⟨go⟩
             /  \   M
           N°   V°
           chê  bɔ́
        ⟨horse⟩ ⟨see⟩
```

28 Medial sum-up

Let's take stock.

- · The meaning of NI structures has gaps
- · Nouns require a quantifier, a thematic role and sometimes a world binder
- · Mediating relations fill these gaps

1. A relation between N and V
   - supplied by alternative numeration
   - provides a thematic role
   - freely selected role, if a.n. is possible
   - verbal functional heads, no a.n.
   - so nouns with those roles don't incorporate

2. A relation above N+V
   - supplied by a categorizing head in Kiowa
   - perhaps light verbs as well (Johns 2007)
   - or verbal mediating relation
   - does not provide a thematic role
   - licenses object incorporation

- · Suggestion to follow up on: The availability of incorporation depends on the presence of these heads

29 Argument structure in object incorporation

The extra verbal head can help us understand a key point of variation in object incorporation

Cross-linguistically, languages vary as to whether object NI affects argument structure

In Kiowa and some languages object NI verbs are still transitive, but in many languages they become intransitive

(36) Transitive object NI: Southern Tiwa (Kiowa-Tanoan, New Mexico US)
a–   diru+   k'ar–hi
2sA.3sO– chicken+eat –FUT
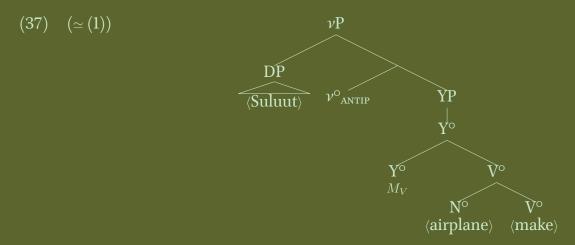
'You will eat the chicken' (Allen et al. 1984: 296)

(1) Intransitive object NI: Kalaallisut / West Greenlandic

Suluut timmisartu+liur –puq
S.ABS   airplane+   make–IND:**INTR**:3s

'Suulut made an airplane.' (Van Geenhoven 1998: 99)

The v° head calls for an agent but does not assign ACC case; the 'antipassive' in a broad sense (Polinsky 2017, Baker 1988, Rosen 1989, Coon 2017)

(37)   ($\simeq$ (1))

vP
DP ⟨Suluut⟩
v° ANTIP
YP
Y°
Y° M_V
V°
N° ⟨airplane⟩
V° ⟨make⟩

How is transitive object NI ruled out in these languages?
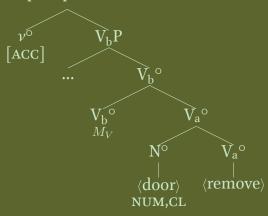
When transitive object incorporation occurs, the agentive v° assigns [ACC] case, and the nominal triggers agreement features.

But what does v° assign case to? The incorporated noun lacks functional material needed for receiving case.

(38)   bé=   chát$_*$+hè̱dè
       2SGA.3INVO=door+ remove.PFV.IMPER

       'open the door! / open the tipi flap!'
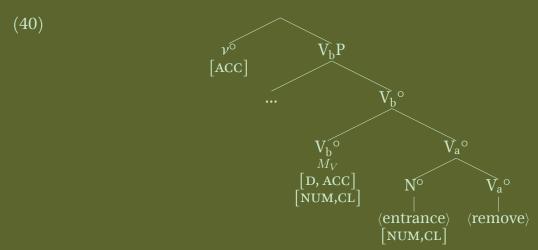
(39)

32 Verbal determiner features

With NI, the 'verb' bears the noun's functional load.
The mediating head does the work of the determiner, so the mediating head is the target.

(40)

v°
$[\text{ACC}]$

V_bP

...

V_b°

V_b°
M_V
$[\text{D, ACC}]$
$[\text{NUM,CL}]$

V_a°

N°
⟨entrance⟩
$[\text{NUM,CL}]$

V_a°
⟨remove⟩

33 Forcing transitive or detransitive object NI

Case assignment and φ-feature transmission are linked to [D] features.

In a language where the categorizing head...

- · can bear a [D] feature → object NI is transitive
- · cannot bear a [D] feature → object NI is intransitive

With no [D]-bearing head to send case to, v°_{AG}'s [ACC] would violate the Case Filter.

Only an agentive head with no case assigner is available— the antipassive.

34 Verb incorporation

Mediating relations can also help understand verb incorporation.

Verb incorporation is common in Kiowa

Manner modifiers are just conjunction, all the argument are shared

(41) a. áuihyầu ∅= xóidé$_*$ –hèl nègáu á$_*$= **kùi+** hầfè –hèl
there   3SGS=land.PFV−EVID and then.DS 3EMPA.3SGO=**drag**+raise.PFV−EVID

'It fell there and they dragged it off.' (Saumty, Goodnight Show)

b. ⟦ *kúi+hầfè* ⟧ = λx$_e$λe$_s$λw$_w$. drag(x)(e)(w) & raise(x)(e)(w) ⟨e, ⟨s, wt⟩⟩

34 Verb incorporation

Ability modals and inchoatives seem to take verbal complements

(42) yá̃= **cûn**_*+ ténxò+dàu
3PLS:1SGD=**dance**_C+allow+be

'I am allowed/permitted to dance.'

(43) è̠= **sál**+ àumà
3DUS=**be hot**+make.DETR.IPFV

'They are catching a fever.'

> the detransitive of 'make' = 'become'

Some have more complicated semantics

(44) á̃ –dàu è= góm+ **bôn**_*+ dàu
stick–INV 3INVS=wind+**bend**+be

'The stick is bent from the wind.'

(45) á= **fó̠**+ bá̃
3EMPS=**see**_C+go.PFV

'They went to see you.'

35 Control-like incorporation

The subject of the embedded verb is 'controlled' by an argument of the main verb.

Resembles Landau (2015)'s logophoric control

(46) èm= qájái$_*$+**fó**+ bá
      2SGS=chief+ **see**$_c$+go.PFV

      'You went to see the chief.' $\simeq$ subject control

(47) èm=   qí+   **kâu**$_*$+jòtjàu
      1SGA.2SGO=firewood+**get**$_c$+ send.IPFV

      'I'm sending you to get firewood.' $\simeq$ object control

35   Control-like incorporation

The embedded arguments do not affect the main verb's argument structure, but can be overt

(48)   a.   à=   chán   ⌈èm=   bǫ́   –jáu*   =dèfèdò ⌉
              1SGS=arrive.PFV ⌊1SGA.2SGO=see.PFV–MOD.VT=in order to⌋

       'I have come to see you.'

       b.   à=   **fǫ́**+   chán
              1SGS=**see**c+ arrive.PFV

       'I have come to see you/ him/ them/ her/ it'

(49)   a.   zébàut   é=   áum   –hêl
              arrow.INV 3SGA:3INVO=make.PFV–EVID

       'He made an arrow.'   INV number is SG here

       b.   zébàut   gà=   **áum**+ mǎuhól   –hèl
              arrow.INV 3SGA:3PLO=**make**+ prepare.PFV–EVID

       'He got ready to make an arrow.'   *mǎuhól* 'prepare' has PL obj
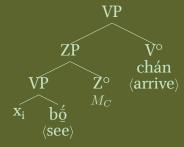
36 A 'control' mediating relation

The verb's event, entity, and world arguments need binders

Its agent or subject needs to be linked to a matrix argument

Mediating relation between V and VP (M_C)

(50) **ám/qáhį̂** à= fǫ́+ chán
you/man 1SGS=see$_C$+arrive.PFV

'I have come to see you/ (a/the) man.'

(51)

VP
├── ZP
│   ├── VP
│   │   ├── x_i
│   │   └── bǫ́
│   │   ⟨see⟩
│   └── Z°
│ M_C
└── V°
    chán
    ⟨arrive⟩

36 A 'control' mediating relation

What does this M_C relation contain? There is an attitude associated with the main event, and if the content of that attitude holds, the embedded VP does, too.

(52)   Purpose relation and associated attitudes

    a.   **Associated attitude**
For any event e, let a_e be an attitude associated with e, held by the agent or acting participant of e.

    b.   **Content relation**
For any worlds w, w', $Cont_w(a_e)(w') = 1$ iff w' is compatible with the content of a_e in w.

    c.   **Mediating relation**
$[\![M_C]\!] = \lambda P_{s,wt} \lambda e_s \lambda w_w. \forall w'[\, Cont_w(a_e)(w') \rightarrow \exists e'[\, \text{the agent of } e' = \text{the holder of } a_e \,\&\, P(e')(w')\,]\,]$
READ: *In all worlds where the attitude content associated with e comes true, there's an event whose agent is that attitude's holder, which has the property P*

    d. $[\![à f \acute{\breve{o}} chán]\!]$ = I arrived, and in all worlds where the attitude content associated with that arrival comes true, there's an event of seeing you whose agent is that attitude's holder

(53)   á   –dàu è=   **têm**$_*$+ còt
      stick–INV 1INVS=**break**+ be hard

      'The stick is hard to break.'   INV here = SG

Recent accounts of *tough*: A modal operator introduces a judge and binds arguments in embedded clause (Keine & Poole 2017, Gluckman 2018)

(54) The stick is tough Op$_1$ [PRO to break x$_1$] $\simeq$ The stick is such that if someone tried to break it, such an event would be tough to accomplish.

McKenzie (2019): A state with an associated attitude allows for a judge

(55)   **Defining a 'special state'**
SpSt(x) = { ⟨s, w⟩ | s is a state that holds of x in w, and ∃b[b = a_s] }

(56)   **Tough predicates include a judge argument and take events**
⟦ *cót* ⟧ = λe_sλj_eλs_s.λw_w. tough(e)(j)(s)(w)
READ: *s is a state of e being strong according to j in w.*

(57)   **The toughness-mediating relation**
⟦ M_T ⟧ = λ$P_{e,swt}$λ$Q_{s,wt}$λx_eλs_sλw_w. SpSt(x)(s)(w) &

$$\forall w' \left[\begin{array}{l} w' \in \text{content}_w(a_s) \rightarrow \\ \forall e[\ P(x)(e)(w') \rightarrow Q(e)(\text{holder}(a_s))(w')\ ] \end{array} \right]$$

READ: *s is a state of x such that in all worlds w' where a relevant judgment in w is accurate, any event of P involving x in w' is Q according to the holder of a_s.*

38 Do complement verbs need mediating relations?

Decomposed attitude predicates (Kratzer 2006, Moulton 2009)

The modal is below the attitude verb, which mainly supplies the modal base

(58) *Sam believes that it is raining*

(59) classic version (Karttunen)

   a. ⟦ *believe* ⟧ = $\lambda p_{wt} \lambda x_e \lambda w_w.$ $\forall w'[\text{Dox}_x(w)(w') \rightarrow p(w')]$ $\langle wt, \langle e, wt \rangle \rangle$

   b. ⟦ *that* ⟧ = $\lambda p.\ p$

(60) decomposed version (Kratzer)

   a. ⟦ *believe* ⟧ = $\lambda x_e \lambda s_s \lambda w_w.$ $\text{believe}(x)(s)(w)$ $\langle e, \langle s, wt \rangle \rangle$

   b. ⟦ *that$_{log}$* ⟧ = $\lambda p_{wt} \lambda x.$ $\forall w'[\text{compatible}(x)(w') \rightarrow p(w')]$

   c. ⟦ *that$_{fact}$* ⟧ = $\lambda p_{wt} \lambda e.$ p exemplifies e

Essentially, the complementizer hosts a mediating relation, or some head in that layer (cp. Landau (2015)'s operator with logophoric control).

39 Decomposing VI with attitudes

Incorporation with these predicates can work likewise.

The attitude holder in Kiowa is typically Applicative, so not an argument of the verb.

(61)　é=　　　　　**cûn**$_*$+　tèndɛ̀u
　　　3sGS.1sGD=**dance**$_C$+want

　　　'I want to dance'

If ⟨want⟩ has a simple meaning, then M_C can be used

(62)　⟦ *téndɛ̃u* ⟧ = λs$_s$λw$_w$. want(s)(w)　　　　　　　　　　　　　　　　⟨s, wt⟩

(63)　⟦ *cûntèndɛ̀u* ⟧ = λs$_s$λw$_w$. want(s)(w) & ∀w′[Cont$_w$(a$_s$)(w′) →
　　　　　　　　　　　　　∃e′[the agent of e′ = the holder of
　　　　　　　　　　　　　a$_s$ & dance(e′)(w′)]]

　　　READ: *s is a state of wanting, and in all worlds compatible with the content of the attitude associated with that wanting, there is a dancing event whose agent is the wanter*

40   Other kinds of complex predicates

Do other complex predicates work with or require mediating relations?

Some restructuring involve multiple clauses, while others involve V+VP structure, where the embedded VP lacks functional material Wurmbrand (2015)

The latter is diagnosed with long object movement/long passive construction (which does not apply in Kiowa)

- matrix subject raised from theme of embedded verb
- matrix verb is passive
- embedded verb is infinitival

(64)   Japanese (Kubota 2014: 1172)
sono hon –wa   ooku –no   hito   –ni   yon –te   mi–rare   –ta
that book–TOPIC many–GEN person–DAT read–TE try–PASSIVE–PAST

lit.: 'That book was attempted to read by many people'

(65)   German (Wurmbrand 2015: 251)
dass der Traktor und der Lastwagen zu reparieren versucht wurden
that [the tractor and the truck].NOM to repair.INF tried   were.PASSIVE.PL

'that they tried to repair the tractor and the truck'

41   Restructuring

Different approaches to these (Kubota 2014, Keine & Bhatt 2016), which involve linking the two verbs.

However, with mediating relations, we get the same result. The matrix verb does not have carry the functional load of what is being incorporated

The morphology raises an intriguing question.

Restructuring verbs are marked for non-finiteness.

Often they are introduced by 'dummy' prepositions

These are ignored in semantic accounts

Like with attitude verbs, perhaps these bear the mediating relation

42 Final summary

To make a long story short:

- · Filling out the semantics of incorporation requires mediating relations
- · These relations require structure to host them.
- · This structure helps us understand certain incorporation and complex verb phenomena.

Many questions left on the table:

- · How much structure *is* there in a complex predicate?
- · What kinds of relations will we see cross-linguistically?
- · Are the relations too powerful, or should they be distributed?
- · Can they be put into the verb or the noun? (cp. Gehrke & Lekakou (2013))
- · What happens as we decompose verbs and nouns into bare roots?

* * * Thank you * * *

43 Acknowledgements

Jé àhôdè bát ą́u!

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