On the Syntax-Semantics Interface of Directed Transport and Caused Motion Expressions

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SFB 991

Concept Types and Frames in Language, Cognition and Science
Düsseldorf, 22. – 24. 08. 2012
Directed Transport and Caused Motion Expressions

(1) Mary brought/carried/threw/pushed/slid the box to John/into the room.

Some observations

- *bring* is lexically a three-place predicate, in contrast to the other verbs occurring in (1).
- *carry, throw* and *push* specify the manner of the action performed by the effector, in contrast to *bring* and *slide*.
- *slide* (and *roll*) specify the manner in which the theme moves, in contrast to *push, bring* (or *transport*).
- *throw* describes a punctual initiation/causing of the motion of the theme carried out by the effector, *carry* and *bring* do not, and *roll* and *slide* are underspecified in this respect.
Introduction

Directed Transport and Caused Motion Expressions

(1) Mary brought/carried/threw/pushed/slid the box to John/into the room.

Some observations (cont’d)

- *carry* and *bring* imply accompanied motion of theme and effector, while *push* does not.
- *throw* does not entail the arrival of the theme at the destination, in contrast to *carry* and *bring*.
- *into* combines locative and directional information.
- *to* may trigger a recipient interpretation in case of animate goals.
Introduction

Examples of tests

Assertion/entailment tests

(2) a. John threw the ball to Peter but the wind blew it to Paul.  
   → arrival of the theme is not lexically entailed (e.g. Beavers 2011)  
   b. Standing at the entrance, John pushed the box into the corner.  
      → locomotion of the effector is not lexically entailed

Aspect/Aktionsart tests

(3) a. John carried/##threw/##brought the box for ten minutes.  
    b. John carried/##threw/brought the box in ten minutes from here to there.  
    c. John #carried/##threw/##brought the box at three.
Core semantics of directed transport and caused motion

An EFFECTOR acts on/applies force to/affects a THEME such that the THEME moves (forward), i.e., (continuously) changes its location (along a PATH).

Differentiae specificae (inter alia)

- specific manner of motion of the THEME
  (slide vs. push, bring)

- specific manner of how the EFFECTOR acts on the THEME
  (carry, push vs. slide, bring)

- continuous control of the motion of the THEME by the EFFECTOR
  (carry, push vs. throw)

- accompanied motion, i.e., shared path of THEME and EFFECTOR
  (carry, bring vs. throw)
Semantic analysis

Sketch of verb classification (for English)

- *bring, take (, transport)*
  accompanied motion, change of location (to destination)

- *carry, schlep*
  accompanied motion, continuous control, manner of action

- *throw, toss, flip*
  initially caused motion, manner of action

- *push, shove, pull, drag*
  enforced motion, manner of action

- *slide, roll, bounce (, move)*
  enforced motion, manner of motion
Event decomposition

Events as described/conceptualized by verbs/words often have (linguistically relevant) internal event components, including:

- Consecutive subevents representing cause and effect.
- Overlapping subevents representing continuous interaction
- Scales related to the progression of events.

Various representational approaches (in linguistics):

- ((Neo)Davidsonian) event logic (Krifka, …)
- (Term-based) event templates (Jackendoff, Van Valin/LaPolla, Rappaport Hovav/Levin)
- Event trees I (Pinker)
- Event trees II (Pustejovsky)
- Decompositional frame semantics
Advantages of decompositional frames

Frames allow us to combine two central aspects of template-based decompositions and logical representations:

- Like decompositional schemas they are concept-centered and have inherent structural properties. I.e., structural positions relevant to the \textit{linking} between syntax and semantics have a natural characterization.

- Like logical representations frames are flexible and can be easily extended by additional subcomponents and constraints.
Semantic analysis

Sketches of decompositional frames

*throw*

- **onset-causation**
  - **cause**
    - punctual-action
      - **effector**
        - 1
      - **theme**
        - 2
    - **manner**
      - throwing
  - **effect**
    - directed-motion
      - **theme**
        - 2
    - **path**
      - **start-pt**
        - pt
      - **end-pt**
        - pt

*pull*

- **extended-causation**
  - **cause**
    - activity
      - **effector**
        - 1
    - **theme**
      - 2
    - **manner**
      - pulling
  - **effect**
    - directed-motion
      - **theme**
        - 2
    - **path**
      - **start-pt**
        - pt
      - **end-pt**
        - pt

(Kallmeyer/Osswald 2012)
Semantic analysis

Sketches of decompositional frames

into

\[
\begin{pmatrix}
\text{directed-motion} \\
\text{PATH} \\
\text{DESTINATION} \\
\text{CONTAINS} (4, 3)
\end{pmatrix}
\]

\[
\begin{pmatrix}
\text{path} \\
\text{END-PT} 3 \\
\text{physical-entity} \\
\text{IN-REGION} 4
\end{pmatrix}
\]

carry

\[
\begin{pmatrix}
\text{transport-activity} \\
\text{EFFECTOR 1} \\
\text{THEME 2}
\end{pmatrix}
\]

\[
\begin{pmatrix}
\text{active_incr_change_of_loc} \\
\text{EFFECTOR 1} \\
\text{THEME 2} \\
\text{MANNER holding}
\end{pmatrix}
\]

\[
\begin{pmatrix}
\text{PROG} \\
\text{INIT} \\
\text{RESULT}
\end{pmatrix}
\]

\[
\begin{pmatrix}
\text{stage ENTITY 1} \\
\text{LOCATION 4}
\end{pmatrix}
\]

\[
\begin{pmatrix}
\text{stage ENTITY 1} \\
\text{LOCATION 5}
\end{pmatrix}
\]

\[
\begin{pmatrix}
4 \prec 5
\end{pmatrix}
\]
Lexicalization & morphosyntax

Cross-linguistic variation

Languages differ w.r.t. their lexical and morphosyntactic means for expressing manner of motion, direction, causation, etc.

- Different lexicalization strategies
- Richness of the case and adposition system
- Availability of multi-verb constructions

Talmy’s distinction between *verb-framed* and *satellite-framed* languages:

Some languages provide primarily deictic motion verbs (or path verbs) while others provide primarily manner (of motion) verbs.

Example: Spanish (verb framed) vs. English (satellite framed)

(4) a. La botella *entro* a la cueva (*flotando*).
    the bottle *MOVED.in* to the cave (*floating*).
    
    b. The bottle *floated* into the cave.
The distinction between verb- and satellite-framed languages has been criticized as being too coarse:

- Slobin: In addition, equipollently-framed languages.
- Matsumoto: Head-framed vs. non-head-framed languages
- Croft/Barðdal/Hollmann/Sotirova/Taoka:
  a. verb framing
  b. symmetrical (coordinate, serial, compounding)
  c. satellite framing
  d. double framing
- Beavers/Levin/Tham:
  Talmy’s typology is *epiphenomenal* and should better be accounted for by a more detailed analysis of the underlying lexical and constructional constraints.
Research goals

The formulation of language-specific constraints and cross-linguistic generalizations about the syntax-semantics interface of the verb-based constructions under investigation, combining decompositional frame semantics and Role and Reference Grammar (e.g. Van Valin 2005)

Languages currently under investigation:

   English, German, Dutch, French, Spanish, Russian, Bulgarian, Tagalog, Korean, Japanese, Lokhota

Data basis:

   - Dictionaries, linguistic literature and native speaker judgements.
   - Small set of native speaker translations of a (very) short story.
   - More systematic work with corpora and questionnaires is planned for the future.
Case studies: Japanese

Verb-verb combinations

- *i*-compounds (more or less lexicalized)
- *te*-compound/construction (syntactic and semantic variation)

**Bring:** *motte iku* (*motsu*: ‘hold’, ‘have’; *iku*: ‘go’)

(5) Taroo wa sono hon o gakkoo ni mot-te it-ta. (te-construction)
   Taro TOP the book ACC school GOAL have-TE go-PAST
   ‘Taro brought the book to the school.’

**Note**

*bring* = *have/hold* + *go*

is a common pattern in serializing languages (Wälchli 2009)

Lexical motion causatives

- *ireru*: ‘cause to go in’, *dasu*: ‘cause to go out’, ...

(6) Boku wa booru o hako ni ire-ta.
   I TOP ball ACC box GOAL cause.to.go.in-PAST
   ‘I put the ball into the box.’
Case studies: Japanese

throw: *nageru* / carry: *hakobu*

(7) a. Boku wa booru o hako ni nage-ire-ta.  
I TOP ball ACC box GOAL throw-cause.to.go.in-PAST  
‘I threw a ball into the box.’ (i-compound)  
(Matsumoto, handout)

b. Boku wa Taroo o heya ni hakobi-ire-ta.  
I TOP box ACC room GOAL carry-cause.to.go.in-PAST  
‘I carried Taro into the room.’

Observations & issues

* ► The directed caused motion verb *ireru* encodes locational information and evokes the full caused motion frame without specifying the manner of action.

* ► To what extent does *nageru* lexically entail directed motion, compared e.g. to *hakobu*?
Case studies: Japanese

roll: korogasu (vt), lexical causative of korogaru (vi) (‘roll’, ‘tumble’)

(8) a. Watashi wa taru o korogashi-te chikashitsu ni ire-ta.
   I TOP barrel ACC roll-and basement GOAL put.into-PAST
   ‘I rolled the barrel into the basement.’ (Croft et al. 2010)

   b. Watashi wa taru o chikashitsu ni korogashi-te ire-ta.
      I TOP barrel ACC basement GOAL roll-TE put.into-PAST

   c. #Watashi wa taru o chikashitsu ni korogashi-ire-ta.
      I TOP barrel ACC basement GOAL roll-put.into-PAST

Possible Hypothesis

- Lexical causatives of intransitive manner-of-motion verbs are less preferred in i-compounds than manner-of-action caused motion verbs, since the former are already causativized.
(9) Watashi wa taru o chikashitsu ni korogashi-te ire-ta.
I TOP barrel ACC basement GOAL roll-TE put.into-PAST

Head-framed languages  (Matsumoto)
Path is encoded by the head (verb) of a clause; these are causative verbs of motion for caused motion expressions, since the head determines the subject, which is the causer.
Case studies: Thai and Chinese

Examples for nonhead-framed languages with V-V constructions (Matsumoto)

Thai

(10) a. khwaan lûukbôn khâw bân
   throw ball enter house
   ‘throw a ball into the house’

b. khwaan lûukbôn phàan nâataâng long pay nay sàp
   throw ball pass window descend go in pond
   ‘throw a ball out of the window down into the pond.’

Chinese

(11) Tā rēng-chū-lái le yige píngzi
   s/he throw-exit-come Asp oneCl bottle
   ‘He threw out a bottle (toward the speaker).’

Caveat  The notion of head is not easy to define for isolating languages.
Case studies: Lakhota

Native American language spoken in North and South Dakota. (Data are largely taken from Ullrich 2008)

Some properties

- Head-marking (i.e. “pro-drop”)
- Left-branching and verb-final
- Split-intransitive (active intransitive verbs are marked in a different way than stative and neutral ones)
- General causative suffix -ya.
- Causative instrumental, “manner-of-action” prefixes which attach to stems and intransitive verbs (partially productive)
Case studies: Lakhota

Some properties (cont’d)

Subset of instrumental prefixes:

- **ka-** by hitting with an instrument (as an ax or hammer)
  by action of wind or water, by outer force

- **wa-** by cutting with a knife or saw

- **pa-** by pushing, by a steady push away from the actor,
  by pushing along, by pressure

- **yu-** by hand, by pulling toward the actor, manually;
  general causation.

(12) a. Žaŋžáŋ kiŋ ka-bléče.
    Glass DEF cause.by.hitting-be.shattered
    ‘He broke the glass.’

   b. Wópȟaȟte kiŋ wa-ȟlóke.
     Package DEF cause.by.cutting-have.a.hole
     ‘He cut a hole into the package.’
Some properties (cont’d)

- A rich system of deictic motion verbs, including:

- Manner of motion verbs occur with deictic motion verbs in verb-verb constructions.

(13) Ziŋtkála kiŋ kiŋyáŋ iyáye.
    Bird DEF fly depart.from.here
    ‘The bird flew away.’
Case studies: Lakhota

Some properties (cont’d)

- Derivation of accompanied motion verbs (bring/take) and caused motion verbs (cause to come/go) from deictic motion verbs.

  a-prefixation → deictic accompanied motion verbs

  e.g. $hí$ (‘arrive here’) → $ahí$ (‘bring smth/sb here’)

  ya-suffixation → deictic caused motion verbs

  e.g. $iyáyA$ (‘depart from here’)

    → $iyayéyA$ (‘cause to depart from here’, ‘send away’)

- Locative and directional prefixes and postpositions/adverbs.
Case studies: Lakhota

**carry**  
*yuhá* — to hold/carry in the hands, have, own  
*yuhá hí* — to carry smth/sb bringing it here

**Pattern**  
*hold + coming/going*  
(*ahí* etc. provide more primitive accompanied motion verbs for *bring*)

**throw**  
*kaŋ’ól* — throwing, tossing, sending flying forth, slinging, flinging

(14) *Kaŋ’ól hiyú-ye.*  
throw(ing) depart.from.there.towards.here-CAUS  
‘He threw it toward here.’

**Note**  
*kaŋ’ól* is a reduced verb form which seems not to occur without a motion verb (and it is characterized as an adverb in Ullrich 2008).
Case studies: Lakhota

roll  
  *pagmígmA*  – to push smth so that it rolls  
  *kagmígma*  – rolling, tumbling  
  *gmigmÁ*  – to be round (spherical), ball-like (, roll)

(15) Čha  *pa-gmígma*  iyáye-khi-ye.  
   and.so  *cause.by.pressure-roll*  *depart.from.here*-DAT-CAUS  
   ‘So she rolled it [the bottle] to him.’

[causation  
  CAUSE  
    CAUSE  
      EFFECTOR [1]  
      THEME [2]  
      MANNER *pressing*  
    EFFECT  
      motion  
      THEME [2]  
      MANNER *rolling*  
  EFFECT  
 ]

[causation  
  CAUSE  
    CAUSE  
      EFFECTOR [1]  
      THEME [2]  
      MANNER *directed-motion*  
    EFFECT  
      directed-motion  
      THEME [2]  
      PATH [START]  
      END [3]  
  ]

CTF 2012
Osswald/Van Valin/Fleischhauer/Latrouite/Van Hooste  
Düsseldorf, 23.08.2012
Case studies: Lakhota

*slide, push,*  \(paslóhAŋ\) – push smth along
*pull, drag*  \(yuslóhAŋ\) – to pull smth/sb over the ground, to drag along
\(slohÁŋ\) – to crawl, creep

(16) a.  \(\text{Wakšíča kiŋ } pa\text{-slóhaŋ } iyé\text{-khi-ye.}\)
   Dish DEF cause.by.pressing-crawl depart.from.here-DAT-CAUS.
   ‘She slid the dish to him.’ (‘She slid him the dish.’)

   b.  \(\text{Yu-slóhaŋ } á\text{-ye.}\)
   cause.by.pulling-crawl bring.away
   ‘He was dragging it away.’

   c.  \(\text{Iwátȟokšu kiŋ ektá waná čhaŋwógnaka kiŋ o-pá-slóhaŋ } iyéya\text{-pi.}\)
   Truck the into now coffin the into-by.pushing-crawl let.go-PL.
   ‘They slid the coffin into the truck.’
   \((iyéyA < iyáyeyA)\)
Conclusion

The next steps

1. Careful morphosyntactic analysis of the constructions under investigation across languages, building on the framework of Role and Reference Grammar.

2. More detailed frame-semantic representation of the various (event) semantic components involved.

3. Formulation of language-specific constraints and cross-linguistic generalizations on the basis of the results of 1. and 2.

4. More data.
**Conclusion**

**The Larger Picture**

- Syntactic inventory → Syntactic representation
- Discourse-pragmatics
- Lexicon → Semantic representation

**Linking algorithm**

**Constructional schemas**

**Morphology — Syntax**
- Juncture: nuclear
- Nexus: cosubordination
- Construction:

**Semantics**
- CAUSE
- EFFECT

**Pragmatics**
- unspecified
Thank you very much for your attention!
References


Directional verb prefixes in German

E.g.: *hin/her* (‘to’), *hinein/(he)rein* (‘into’) (deictical)

(17) a. werfen (‘throw’), hinwerfen, hineinwerfen
    b. tragen (‘carry’), hintragen, hineintragen
    c. schieben (‘push’), hinschieben, hineinschieben
    d. rollen (‘roll’), hinrollen, hineinrollen

Double marking of path information:

(18) a. weil Peter das Fass zum Eingang hinrollen wollte.
    because Peter the barrel to-the.DAT entrance to-roll.INF want.PAST
    ‘because Peter wanted to roll the barrel to the innkeeper.’
    b. weil Peter das Fass in den Raum hineinrollen wollte.
    because Peter the barrel in(to) the.ACC room into-roll.INF want.PAST
    ‘because Peter wanted to roll the barrel into the room.’
Zu-prefixation in German

(19) zuwerfen (‘to-throw’), #zutragen (‘to-carry’), zurollen (‘to-roll’)

Zu-prefixation as *applicative construction*:

(20) a. weil Peter das Fass zum Wirt rollte.  
   because Peter the barrel to-the.DAT innkeeper roll.PAST  
   ‘because Peter rolled the barrel to the innkeeper.’

   b. weil Peter dem Wirt das Fass zurollte.  
   because Peter the.DAT innkeeper the barrel to-roll.PAST  
   ‘because Peter rolled the innkeeper the barrel.’

Preferred reading for (20-b):

   ‘Peter pushed the barrel to make it roll to the innkeeper.’