Force-dynamic image schemas: between verb and argument structure construction

William Croft
University of New Mexico
In *Verbs: Aspect and Causal Structure* (2012), I present a decompositional analysis of aspectual construals, which can be thought of as aspectual image schemas for conceptualizing events.
Here I will propose that the causal chain model of argument structure proposed in *Verbs* (and earlier) can be refined to produce an analogous model of force-dynamic image schemas.
Aspectual image schemas
Lexical aspect: the Vendler classification (and the Mourelatos definitions)

- **States**: stative, unbounded, durative (*love, see, be tall, be happy*)
- **Activities**: dynamic, unbounded, durative (*walk, rattle, dance*)
- **Achievements**: dynamic, bounded, punctual (*shatter, reach [the summit]*)
- **Accomplishments**: dynamic, bounded, durative (*cross [the street], read [a book]*)
Problem: variation in “lexical” aspect

*I see Mount Tamalpais.*

*I reached the crest of the hill and saw Mount Tamalpais.*

‘Seeing has a state sense too...“seeing” is an achievement initiating the generic sense of seeing’ (Vendler 1967:118)

*He reached the summit at 2:15pm.*

*It took him 3 hours to reach the summit.*

‘Even if one says that it took him three hours to reach the summit, one does not mean that the “reaching” of the summit went on during those hours’ (Vendler 1967:104)

Variation has not been systematically explored
Aspectual types are aspectual construals

• A verb may have many alternative aspectual construals of the event

• These are a verb’s *aspectual potential*

  Denise touched the painting. [cyclic achievement]
  Denise was touching the painting. [undirected activity]
  The chair is touching the painting. [transitory state]
  She pushed the chair so far that it touched the painting. [directed achievement]
  The San Andreas Fault touches the east side of the campus. [inherent state]

(Croft 2012:83)
Aspectual construals are *image schemas*

- The aspectual construals are constrained by, but not determined by, the tense-aspect constructions in which the verb occurs.

  *Denise touched the painting.*  [cyclic achievement]
  *Denise was touching the painting.*  [undirected activity]
  *The chair is touching the painting.*  [transitory state]
  *She pushed the chair so far that it touched the painting.*  [directed achievement]
  
  *The San Andreas Fault touches the east side of the campus.*  [inherent state]

(Croft 2012:83)
Aspectual construals are image schemas

- The aspectual construals are *image schemas* that are partly independent of both verb and tense-aspect construction

Denise touched the painting.  [cyclic achievement]
Denise was touching the painting.  [undirected activity]
The chair is touching the painting.  [transitory state]
She pushed the chair so far that it touched the painting.  [directed achievement]
The San Andreas Fault touches the east side of the campus.  [inherent state]

(Croft 2012:83)
Aspectual construals are image schemas

- Instead, a combination of verbal aspectual potential, constructional polysemy and use in context leads to the aspectual interpretation

Denise touched the painting. [cyclic achievement]
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(Croft 2012:83)
From aspectual to force-dynamic image schemas
A construal approach to argument structure alternations

• An interesting (but typologically uncommon) property of the expression of events in English is the widespread occurrence of **argument structure alternations**

• This has led to a wide range of approaches to their semantic and syntactic analysis

*Jack sprayed paint on the wall.*
*Jack sprayed the wall (with paint).*
A construal approach to argument structure alternations

• Levin (1993) defines English verb classes based on argument structure alternations

• These verb classes are largely semantically based (or so it is implied)

• But Fillmore and Atkins (1992) suggest these alternations can represent different semantic frames (COVER and FILL)

Jack sprayed paint on the wall.
Jack sprayed the wall (with paint).
A construal approach to argument structure alternations

- Baker and Ruppenhofer (2002) extend this insight in FrameNet

FrameNet

- PLACING
  - put
  - place

- FILLING
  - load
  - spray
  - butter
  - fill
  - festoon
  - encircle

- CONTAINING
  - contain

Levin (1993)

- FILL
  - festoon
  - fill
  - encircle
  - contain

- SPRAY/LOAD
  - load
  - spray

- PUTTING
  - place
  - put
  - butter
  - caulk
  - BUTTER
A construal approach to argument structure alternations

- Dang et al. (1998) take the opposite approach, using verb distribution in all argument structure constructions.
A construal approach to argument structure alternations

- Levin (and Dang et al.) imply a unitary or at least shared meaning across verbs
- Baker and Ruppenhofer imply different senses of the verb
- Goldberg (1995) argues that the semantic difference belongs with the construction

*Jack sprayed paint on the wall.*
*Jack sprayed the wall (with paint).*
A construal approach to argument structure alternations

• Nemoto (2005:125) argues that the semantic difference can’t be attributed to the construction

John trimmed the tree.
[Decorating (…with lights)
or Removal (…of overgrown branches)]
A construal approach to argument structure alternations

• Nemoto (2005:125) argues that the semantic difference can’t be attributed to the construction

• But this conclusion doesn’t follow (Croft 2012:374); on the other hand, this does mean that the construction doesn’t fully determine the semantic interpretation

The men sprayed the lawn. (Croft 2012:367)
The broken fire hydrant sprayed water all afternoon. (Croft 1998:43)
A construal approach to argument structure alternations

- Iwata (2005:125) proposes two levels of meaning (cf. Croft 1998:43)
- L-meaning is a rich lexical semantic structure

Finally, Pinker treats locative alternation as a special relationship between two variants. But the alternation is not restricted to the two alternants. Wrap allows three variants.

(16) a. She wrapped the baby in a towel.
b. She wrapped the baby with a towel.
c. She wrapped a towel around the baby. (Nakau 1994)

Pinker's analysis has difficulty in handling (16).

3. Analysis

3.1. L-Meaning and P-Meaning

Toward the goal of working out a solution, let us begin by examining what is actually going on in the phenomenon called locative alternation. Our focal example is *spray*. What has been overlooked in previous analyses is the fact that in a conventional spraying scene, one sends substance in a mist back and forth, as in Figure 2. As a result of this back and forth movement, the substance eventually comes to cover a large portion of the surface to which it has been applied. So a spraying scene is described as in Figure 3, where a double-sided arrow indicates a back and forth movement of a substance's application. Notice that this spraying scene can receive two alternate interpretations. If we focus upon the paint, we get an event of sending a substance in a mist. Hence the locative variant of *spray* as in Figure 4.

Figure 2. Movements during conventional spraying scene

Figure 3. Substance's application during spraying scene

(Iwata 2005:361)
A construal approach to argument structure alternations

- Iwata (2005:125) proposes two levels of meaning (cf. Croft 1998:43)
  - P-meaning is a construal that occurs in an argument structure construction

If, on the other hand, we focus upon the wall, this is an event of covering the wall with paint. Accordingly, *spray* ends up in the [NP V NP with NP] frame, parallel to *cover*, as in Figure 5.

Thus the ability of *spray* to alternate stems from the fact that a spraying scene can be construed either as moving paint onto the wall or as covering the wall with paint.

This view of the locative alternation reveals a crucial distinction between *spray* on the one hand, and *spray paint onto the wall* or *spray the wall with paint* on the other. The meaning of *spray* is all that is enclosed at the top in Figure 4 or Figure 5. That is to say, *spray* means to send a liquid in a mist or fine droplets AND to cover a surface with an even coat of deposited liquid adhering to it. By contrast, *spray paint onto the wall* or *spray the wall with paint* means a construal of this scene either as a sending activity or as a covering activity. Let us call the meaning of the former Lexical Head Level Meaning, or L-Meaning, and that of the latter Phrase Level Meaning, or P-Meaning. When that part of the L-meaning compatible with a thematic core is profiled (Langacker 1987, 1991) with *spray paint onto the wall*:

- 'To send a liquid in a mist or fine droplets'
- 'To cover a surface with an even coat of deposited liquid adhering to it'

(Iwata 2005:362)
A construal approach to argument structure alternations

- Emission, covering etc. are **force-dynamic construals/image schemas**
- A verb has a **force-dynamic potential** to be construed in different ways
- Argument structure constructions constrain but do not determine construals

*Jack sprayed paint on the wall.*  
*Jack sprayed the wall with paint.*  
*Water sprayed onto the lawn.*  
*The broken fire hydrant sprayed water all day.*
Construals and argument structure constructions

- Many verbs have varied force-dynamic potential

Kay wiped the counter with a cloth. [caused contact]
Kay wiped the counter clean. [change of state]
Kay wiped the fingerprints from the counter. [removal]
Kay wiped the polish onto the table. [application]

(adapted from Rappaport Hovav and Levin 1998:119-20)

Nora pushed the package to Pamela. [directed motion]
Nora pushed at/against the package. [conative]
Nora pushed the branches apart. [caused separation]
Nora pushed the package. [force exertion]

(Dang et al. 1998:295-96)
A crosslinguistic perspective: variation in force-dynamic construal

• Languages vary as to which force-dynamic image schemas are associated with a particular (formal) argument structure construction

• Languages vary as to the force-dynamic potential of predicates in particular event classes

• Languages vary as to which force-dynamic image schema is conventionally used to express certain classes of events
Transfer in English

• English uses the ditransitive [SBJ OBJ1 OBJ2] construction and the [SBJ OBJ to OBL] constructions to express transfer with give-class predicates.

• English uses the same construction for transfer when ballistic motion is involved, vs. [SBJ OBJ at OBL] for conative.

*She gave him the ball.*  
[transfer, give class]  
*She gave the ball to him.*  
[transfer, give class]  

*She threw him the ball.*  
[ballistic motion+transfer]  
*She threw the ball to him.*  
[ballistic motion+transfer]  
*She threw the ball at him.*  
[ballistic motion, conative]
Transfer in Mian
(Ok, Papua New Guinea)

- The same is true of Mian, which uses indexation for all arguments in an indirective alignment, that is, Patient≠Theme≠Recipient (Fedden 2010:470, 476)

monîo omØ^wensea yē dê’nobe
money it.give.her.he there refuse
‘(He) gave (her) money, (but) there (she) refused (it).’

memâlo nakae afule obônea unângo obbià^b’onea…
now man ball get woman it.throw.give.her.he
‘Now the man gets the ball and throws it to the woman,…’
Transfer and contact in Teop (Oceanic, Bougainville)

- But in Teop, which uses a double object construction for transfer, putting a ballistic motion verb in this construction leads to a caused contact force-dynamic construal (Mosel 2010:487, 504)

me Toko paa hee bene Sookara bona overe and.ART Toko TAM give ART Sookara ART coconut
‘Toko gave Sookara the coconut.’

me sinanae, na tasu bene sinanae bona vaakokopao and.ART mother.his TAM throw ART mother.his ART v.fruit
‘And his mother, (he) hit his mother with the vaakokopao fruit.’
Transfer, conative and caused contact in Chintang (Kiranti, Nepal)

• In Chintang, the double object argument structure construction for transfer with ‘give’ is conative with ballistic motion (Bickel et al. 2010:388, 391)

\[
\text{piʔ} \quad \text{ghāsa} \quad \text{piduhē}
\]

\[
\text{cow(NOM) grass(NOM) give}
\]

‘I gave grass to the cow.’

\[
\text{gol} \quad \text{Rame} \quad \text{omayan}=\text{kha}
\]

\[
\text{ball(NOM) Rame(NOM) throw.PASS=COP}
\]

‘The ball was thrown (at Rame).’
Transfer, conative and caused contact in Chintang (Kiranti, Nepal)

• The transfer construal is found with the [ERG INST NOM] argument structure construction, which is also used for caused contact (Bickel et al. 2010:393)

huncena golceña hana oma konno
they-ERG balls-INST 2SG(NOM) throw should
‘They should throw the balls to you.’

huĩsaña golña hana naore
DEMS-ERG ball-INST 2SG(NOM) throw
‘He hit you with a ball.’
In Hunzib, the [ERG ABS DAT] construction is used not for transfer with ballistic motion verbs, but for conative (Daniel et al. 2010, from Van den Berg 1995:144)

k’ek’e də gudii čaler
roasted_barley(ABS) I(ERG) hen-DAT strew

budil diʔi qoqla nıLər
hen-ERG I.DAT egg(ABS) gave

qoqla də hemma-a mijaar
egg(ABS) I(ERG) pillar-DAT beat

‘I threw the barley at the hen [conative]/
The hen gave me an egg [transfer]/
I beat the egg against the pillar [caused contact].’
Transfer and conative in Hunzib (East Caucasian, Dagestan)

- Daniel et al. 2010 argue that [ERG ABS DAT] for conative ballistic motion is related to that for caused contact.

k’ek’e də gudii čaler
roasted_barley (ABS) I (ERG) hen-DAT strew

gudil diʔi qoqla niLər
hen-ERG I. DAT egg (ABS) gave

qoqla də hemma-a mijaaq
egg (ABS) I (ERG) pillar-DAT beat

‘I threw the barley at the hen [conative]/
The hen gave me an egg [transfer]/
I beat the egg against the pillar [caused contact].’
Whereas [ERG ABS DAT] for transfer is related to the transitive construction with DAT for beneficiary (example from Van den Berg 1995:200)

**taleh ni\-\text{\text screaming } ob, dibi halt’in buwa də, happiness give you-DAT work(ABS)-and do I(ERG)**

**bel pur\-\text{\text screaming } un ni\-\text{\text silica } digo this van(ABS) give me-AD**

‘Bless you, I will do that work for your sake, lend me this van.’
Transfer and conative in Hunzib (East Caucasian, Dagestan)

- And the [ERG ABS Spatial] construction, which is used for transfer with ballistic motion verbs (not illustrated here)—analogous to English [SBJ OBJ at OBL] used for conative ballistic motion—is also used for temporary possession (AD = ‘near’)

\[
\begin{align*}
taleh & \quad ni\text{-}lob, \quad dibi \quad haltin \quad buwa \quad do, \\
& \quad happiness \quad give \quad you-DAT \quad work(ABS)-and \quad do \quad I(ERG) \\
\end{align*}
\]

\[
\begin{align*}
bel & \quad pur\text{-}un \quad ni\text{-}lo \quad digo \\
& \quad this \quad van(ABS) \quad give \quad me-AD \\
\end{align*}
\]

‘Bless you, I will do that work for your sake, lend me this van.’
Application and attachment in English

- English uses a [SBJ OBJ GoalPrep+OBL] construction to express both application and attachment
- A [SBJ OBJ SourcePrep+OBL] construction is used for removal and detachment

He put his wife into the shelter.  [application]
He put the skin on top of the fire.  [application]
He tied the cow to the tree.  [attachment]
He broke off a piece from the cassava.  [detachment]
Application and attachment in Bora (Bora-Witotoan, NW Amazon)

- Bora uses a [SBJ OBJ OBL-vu (allative)] construction to express application.

áawavuváa pícyo-iñuube téniihyo mëwániíhyoke
shelter.ALL put-do.go that wife.OBJ.AN
‘He put his wife into the shelter.’

áanemávaa témííhe pícyoobe cújúwá halluvu
with.that skin(OBJ) put fire on.top
‘In that circumstance, he put the skin on top of the fire.’
Application and attachment in Bora (Bora-Witotoan, NW Amazon)

• But Bora uses a [SBJ OBJ OBL-tu (ablative)] construction to express attachment

• Thiesen & Weber argue that attachment is metaphorically expressed as a connection coming from the ground object

\[ \text{ócähikye dohjínuube úméhetu} \]
\[ \text{cow.OBJ.AN tie-do tree.ABL} \]
‘He tied the cow to the tree.’

\[ \text{îhdeéuúvutu ípiijyúwá dóhjínúne.} \]
\[ \text{very.old.line.ABL hook(OBJ) tie-do} \]
‘In that circumstance, he put the skin on top of the fire.’
Application and attachment in Bora (Bora-Witotoan, NW Amazon)

- [SBJ OBJ OBL-tu (ablative)] also appears to be used for detachment or removal, though perhaps it is partitive
- Even ‘put’ occurs in this argument structure construction

ehdúváa néélle dōuháyójéh mááhójítu
that saying break-do.come cassava.ABL
‘Saying that, he broke off (a piece) of the cassava.’

aawáváa iújcúne wájcátu pícyoólle
hook get branch.ABL put
‘Grabbing that hook she put it on a branch.’
Application and attachment in Bora (Bora-Witotoan, NW Amazon)

• [SBJ OBJ OBL-\textit{tu} (ablative)] is also used for contact

• And even, optionally, for predication of possession: possession as attachment?

\textit{aabéváa díílledívú wajtsbeke téénetu idyómaúcunúne the.one to.her arrive.here it[dye].ABL touch}
‘[She grabbed] the one who arrived to her, having been touching the dye.’

\textit{óhdi(tu) ijcyáne 1SG.AN.ABL be}
‘I have it.’
Caused contact and covering in English

- English uses the [SBJ OBJ with OBL] construction for caused contact
- The same construction is also used for covering

He washed the dishes with the soap. [caused contact]

She came covering her breasts with her hands. [covering]
Application and attachment in Bora (Bora-Witotoan, NW Amazon)

• Bora uses a [SBJ OBJ OBL-ri (locative)] construction to express caused contact

njtyúwaváa itsájtyéwari níjtyuube bohtámu
wash taken.along.soap.LOC wash dishes(OBJ)
‘He washed the dishes with the soap he had taken along.’

ehdúváa néébere dílleke íllaáyóh úméhéhiyi…
thus saying her.OBJ.AN hit stick.LOC
‘Thus saying, he hit her with a stick…’
Application and attachment in Bora (Bora-Witotoan, NW Amazon)

• But Bora uses the [SBJ OBJ OBL-vu (allative)] construction, used for application as we saw, to express covering

tsaalle ímujpáñéécú íhyóhtsívu iwátájcónema
come breast.DU(OBJ) hand.ALL covering
‘Therefore she came covering her breasts with her hands.’
In fact, covering the body, at least, appears to be construed as adornment, which in turn is construed as “putting” the body into its covering (clothes, jewelry, hands).

‘The mother inserted the children into the jackets…’

‘Then, sis, put on all your little jewels.’
Application and attachment in Bora (Bora-Witotoan, NW Amazon)

• This may account for the expression of transfer using the [SBJ OBJ OBL-vu (allative)] construction, a typologically exceptional construction: possession as adornment?

íllíkyeváa ájcuube íañújuvu
his.son.OBJ.AN give gun.ALL
‘He gave his gun to his son.’

cána bo oke duhyétsó díhya náávevu
suggest urge 1SG.OBJ.AN see-CAU your.house picture.ALL
‘I urge you to show me a picture of your house.’
Conclusions: the nature of force-dynamic image schemas

• Force dynamics, like aspect, is a semantic structure that is partly autonomous from both verbal lexical semantics and argument structure constructions

• The examples from other languages show that we have a lot to learn about variation and universals of force dynamics image schemas with respect to event classes and argument structure constructions

• Finally, an analysis of the structure of force dynamic image schemas seems possible (BLS 2015)