On the interaction of aspect and causality in two Hindi/Urdu ability constructions

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Causal reasoning and causal language

'Practical' causal intuitions vs. linguistic causation

- causal reasoning draws on complex networks of relationships: **causal models**
- linguistic causation: typically binary *cause-effect* relations

An alternative: causal models as discourse parameters

- causal language describes structures in an online language-independent representation
- discourse contributions interact (in familiar ways) with such representations
- model relationships can explicate linguistic effects

(Nadathur & Lauer 2020, Baglini & Bar-Asher Siegal 2021, a.o.)

Today: use this approach to shed light on two surprising inference patterns in abilitative constructions

Two Hindi/Urdu ability constructions

The patterns of interest involve the interaction of **aspect** and **ability**:

1. **Aspectual complex predicates** with **le** ('take'):

(1) a. Anjum gaaṛii calaa **le-tii** (hai).
Anjum car drive take-IMPF.F.SG (be.PRS.SG)
'Anjum will/does drive the car.'

b. Anjum-ne gaaṛii calaa **l-ii**.
Anjum-ERG car drive take-PFV.F.SG
'Anjum drove the car.'

Light verb **le** reinforces an episodic interpretation with **perfective** marking, but induces a **dispositional** (modal?) reading in the **imperfective** (Butt 1997)

Two Hindi/Urdu ability constructions

The patterns of interest involve the interaction of **aspect** and **ability**:

2. **Ability attributions** with **sak** ('can'):

(2) a. Anjum gaaṛii calaa **sak-tii** thii (lekin
Anjum car drive can-IMPF.F.SG be.PST.F.SG (but
us-ne gaaṛii kabhii nahĩĩ chalaa-yii.)
3SG.ERG car sometime NEG drive-PFV.F.SG.
'Anjum could drive the car (but she never drove the car).'

b. Anjum gaaṛii calaa **sak-ii** (#lekin us-ne gaaṛii
Anjum car drive can-PFV.F.SG (#but 3SG-ERG car
nahĩĩ calaa-yii)
NEG drive-PFV.F.SG
'Anjum was able to drive the car (#but she didn't drive the car).'

'Pure' (unrealized) ability in with the **imperfective**, but **actuality entailments** under **perfective** marking (Bhatt 1999)

Two Hindi/Urdu ability constructions

The patterns of interest involve the interaction of **aspect** and **ability**:

- In both cases, perfective marking flattens a modal meaning which emerges in the imperfective
- **Actuality entailments** are a cross-linguistic phenomenon (English *was able*, French *pouvoir*, Greek *boro*, Spanish *poder, ser capaz*, . . .), making an account from ambiguity unlikely
- The similarity between the **dispositional** and **actualizing** alternations suggests a unified analysis is possible

Main idea: abilitative/dispositional readings reflect a shared **causal** structure, with consequences for aspectual composition

Outline of the talk

1. Introduction
2. The dispositional complex predicate: towards an analysis
3. From standard ability to implicativity
4. Causal semantics for implicativity
5. Implicative structure for the dispositional complex predicate
6. Conclusion

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Light verb constructions

Hindi/Urdu has a rich system of **complex predicates**, formed by combining an (uninflected) 'main' verb with a **light verb** from a delimited set (Hook 1974, a.o.)

Based on (di)transitives	Based on intransitives
le ('take')	*aa* ('come')
de ('give')	*jaa* ('go')
ḍaal ('put')	*paṛ* ('fall')
maar ('hit')	*mar* ('die')
nikaal ('pry out')	*nikal* ('emerge')

Table: Some common light verbs (Butt 1993)

,

(3) a. Anjum-ne baccõ-ko so-ne **di**-yaa
Anjum-ERG children-DAT sleep-INF.OBL give-PFV.M.SG
'Anjum let the children sleep.'

b. Anjum so **ga**-yii
Anjum sleep go-PFV.F.SG
'Anjum slept off.'

Aspectual complex predicates

Light verb constructions have a range of functions, including **aspectual** ones:

(4) a. Anjum-ne gaanaa gaa **ḍaal**-aa
Anjum-ERG song sing put-PFV.M.SG
'Anjum sang a song (deliberately, forcefully).'

b. Anjum gaanaa gaa **paṛ**-ii
Anjum song sang fall-PFV.F.SG
'Anjum fell to singing (spontaneously, involuntarily).'

- Light verb choice is associated with inception/completion information (Masica 1976, Butt 1993, Singh 1990, 1998, a.o.)
- The **dispositional** reading is restricted* to complex **le** predicates (Butt 1997)

(1a) Anjum gaaṛii calaa **le-tii** (hai).
Anjum car drive take-IMPF.F.SG (be.PRS.SG)
'Anjum will/does drive the car.'

Habitual and episodic interpretations

The core aspectual contrast is between **imperfectives** and **perfectives**:

- **Habitual** interpretation:

(5) Anjum gaaṛii calaa-**tii** hai/thii
Anjum car drive-IMPF.F.SG be.PRS.SG/be.PST.F.SG
'Anjum drives/used to drive the car.'

- **Episodic** interpretation:

(6) Anjum-ne gaaṛii calaa-**yii** (hai).
Anjum-ERG car drive-PFV.F.SG (be.PRS.SG)
'Anjum drove (has driven) the car.'

The dispositional predicate

Perfective **le** ('take') is usually analyzed as an **aspectual auxiliary**

(7) a. Maayaa-ne biskaṭ khaa-yaa lekin use puuraa nahĩĩ
Maya-ERG cookie eat-PFV.M.SG but it.ACC whole NEG
khaa-yaa
eat-PFV.M.SG
'Maya ate the cookie but did not finish it.'

b. Maayaa-ne biskaṭ khaa li-yaa, #par use puuraa nahĩĩ
Maya-ERG cookie eat take-PFV.M.SG, #but it.ACC whole NEG
khaa-yaa.
eat-PFV.M.SG
'Maya ate the cookie, #but did not finish it.'

- **Le** appears to introduce a strong **culmination** requirement
(Singh 1998, Arunachalam & Kothari 2011, Altshuler 2014, Nadathur & Filip 2021)

The dispositional predicate

So, why is there a "funny dispositional reading" for complex **le** predicates in the imperfective? (Butt 1997)

(1a) Anjum gaaṛii calaa **le-tii** (hai).
Anjum car drive take-IMPF.F.SG (be.PRG.SG)
'Anjum will/does drive a car.' *(Anjum can and does drive a car)*

- Comparable to **dispositional** (existentially-interpreted) English generics (Lawler 1973)

(8) My pet toad will eat flies.
The toad can and does eat flies (under the right circumstances), but not necessarily in all eating situations, and not necessarily to the exclusion of other foods

Characterizing the dispositional reading

The **dispositional complex predicate** (DCP) is particularly appropriate as a counter to *negative expectation*:

(9) a. acchaa, vo hindi bhii bol-tii hai?
yes, she Hindi also speak-IMPF.F.SG be.PRS.SG
'Oh, she also speaks Hindi?'

b. hãã hãã, bol **le-tii** hai. kyũ nahĩĩ bol-e?
yes yes, speak take-IMPF.F.SG be.PRS.SG. why NOT speak-SUBJ
'Yes, she (can and) does speak Hindi. Why not?' (Butt 1997)

(10) climate change-kii vajah-se vo aaj-kal gaaṛii nahĩĩ calaa
climate change-GEN reason-INST 3.SG today-tomorrow car NEG drive
rahii hai, lekin bilkul vo gaaṛii calaa **le-tii**
PROG.F.SG be.PRS.SG, but certainly 3.SG car drive take-IMPF.F.SG
hai.
be.PRS.SG
'Due to climate change, she's not driving the car (regularly) these days, but she certainly (can and) does drive the car.' (R. Bhatt)

Characterizing the dispositional reading

The **dispositional predicate** differs from **standard ability** in whether or not the ability is exercised:

(11) a. Anjum gaaṛii calaa **sak-tii** hai, lekin
Anjum car drive can-IMPF.F.SG be.PRS.SG, but
cala-tii hii nahĩĩ
drive-IMPF.F.SG only NEG
'Anjum can (has the ability) to drive a/the car, but (she) doesn't drive.'

b. Anjum gaaṛii calaa **le-tii** hai, #/??lekin
Anjum car drive take-IMPF.F.SG be.PRS.SG, #/??but
cala-tii hii nahĩĩ
drive-IMPF.F.SG only NEG
'Anjum (can and) does drive a/the car, #/??but (she) doesn't drive.'

Characterizing the dispositional reading

A **presuppositional** difference: particular conditions for the ability to be exercised

(12) a. agar raastaa pakkaa ho, Anjum saikal calaa **le-gii**
if road correct be, Anjum cycle drive take-FUT.F.SG
'If the road is good, Anjum will ride a bicycle.'

b. ??agar raastaa pakkaa ho, Anjum saikal calaa **sak-egi**
if road correct be, Anjum cycle drive can-FUT.F.SG
'If the road is good, Anjum will be able to ride a bicycle.'

- **(12b) $\not\equiv$ (12a):**
(12a) predicts what Anjum *will* do, (12b) establishes what she's capable of
- *NB:* the dispositional reading also arises with future marking

Characterizing the dispositional reading

Generalizations:[1]

1. The subject (agent) has the ability to perform some action (specified by the 'main' predicate)
2. The agent *chooses* (and has been observed to choose to) exercise the ability (hence, *dispositional*)
3. The above combination makes the DCP well-suited to negative contexts (emphasizes countering the negative expectation)

Interim conclusion: a modal analysis (conditional necessity) is warranted

[1] From Butt (1997), adapted with some carefully-chosen liberties of phrasing

Happenstance: insights from Sinhala

A connection to **Sinhala involitive verbs?** (Inman 1993)

- Marked **involitives** alternate with unmarked/neutral **volitive** forms

(13) a. laməya kooppe **binda** (eet hitəla nemeyi)
child.NOM cup break.PST (but intend.PTCPL NEG)
'The child broke the cup, but not intentionally.'

b. laməya atiŋ kooppe **biňduna**
child ERG cup break.INV.PST
'The child (accidentally) broke the cup.'

- It's unlikely that **INV** is specified for accidentality or involition

(14) ?laməya atiŋ piŋgaanə hitəla **biňduna**
child ERG plate intend.PTCPL break.INV.PST
'The child broke the plate on purpose.'

Happenstance: insights from Sinhala

Present tense **involitives** have **dispositional** readings (± volition):

(15) a. kellə atiŋ maalu ageeṭə **pihenəwa**
girl ERG fish.ACC.PL very.well cook.INV.PRS
'The girl can cook fish very well' (De Silva 1960)

b. Mahatuŋ atiŋ mee kææmə hoňdəṭə **hædenəwa**
Mahatun ERG this food well make.INV.PRS
'Mahatun makes this food well (as it turns out/unexpectedly).'

- Compare to **dispositional le:**

(16) Mahatun ye khaanaa acchaa banaa **le-taa** hai.
Mahatun this food well make take-IMPF.M.SG be.PRS.SG
'Mahatun (can and) does make this food well.'

- Entailment facts are also comparable:
INV → **VOL** (reverse marked), **le** predicates entail simple counterparts

Happenstance: insights from Sinhala

Inman's proposal: INV introduces **happenstantial modality**

(17) a. The child **happened** to break the cup, #but she didn't break the cup.
b. Mahatun **happens** to make this dish well, #but he doesn't make it well.

- Happenstance is cashed out as **teleological** or **doxastic non-necessity**

(18) $[\![\text{INV}(\alpha)]\!]^w := \alpha(w) \,\&\, \exists w' \in \text{ACC}(w)[\neg\alpha(w')]$

(19) laməya atiŋ kooppe **biňduna**
'The child happened to break the cup.'
The child broke the cup and there is some world compatible with her intentions and circumstances in which she did not break the cup.

(20) mahatuŋ atiŋ mee kææmə hoňdəṭə **hædenəwa**
'Mahatun happens to make this food well'
Mahatun makes this food well and there is some world compatible with the speaker's expectations in which he does not do so.

A happenstantial view of the dispositional predicate?

First pass:

(21) $[\![\text{le}(\alpha)]\!]^w := \alpha(w) \,\&\, \exists w' \in \text{EP}(w)[\neg\alpha(w')]$

(1a) Anjum gaaṛii calaa **le-tii** (hai).
Anjum car drive take-IMPF.F.SG (be.PRS.SG)

'(As it happens), Anjum (can and) does drive a/the car.'

Anjum drives the car and there is some world compatible with (my) expectations in which she does not drive the car.

- No accidental reading for DCP, so ignore the goal-oriented option
- **Captures:** the entailment facts, and appropriateness in 'unexpected' contexts
- **Does not capture:** inference of 'choice' (subject chooses to exercise the disposition)
- **Unclear:** what happens to the presupposed conditions of exercise?[2]

[2] Butt (1997): *le* invokes conditional necessity, with a modal base containing "the speaker's expectations and the conditions under which the subject will perform the given action"

A happenstantial view of the dispositional predicate?

Intuition: two changes needed to get the facts right

(a) Distinguish the **main predication** (the target event) from **deliberate choice**

(b) Move modality into **not at-issue** content

(22) The child didn't happen to break the plate
→ *She didn't break the plate, and it was possible that she would not break the plate.*

Sketch proposal:

(23) Given a one-place predicate P and an agent x, **le**$(P)(x)$

a. *Presupposes:* A prior choice $A(x)$ for x is **necessary** and **sufficient** to bring about $P(x)$

b. *Asserts:* x made choice $A(x)$

- **Hope:** pushing modality into presuppositional content might help reconcile the dispositional reading with the apparently non-modal perfective use

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The ability/actuality alternation

The Hindi/Urdu **ability modal sak** licenses **actuality entailments** (Bhatt 1999)

- **imperfective** aspect has a **pure ability** reading

(24) Yusuf havaii-jahaaz uṛaa **sak-taa** thaa, lekin
Yusuf air-ship fly can-IMPF.M.SG be.PST.M.SG, but
us-ne havaii-jahaaz kabhii nahĩĩ uṛaa-yaa.
3SG-ERG air-ship sometime NEG fly-PFV.M.SG
'Yusuf had the ability to fly planes, but he never flew a plane.'

- **perfective** aspect gives rise to an **actuality entailment**

(25) Yusuf havaii-jahaaz uṛaa **sak-aa**, #lekin us-ne
Yusuf air-ship fly can-PFV.M.SG, #but 3SG-ERG
havaii-jahaaz nahĩĩ uṛaa-yaa.
air-ship NEG fly-PFV.M.SG
'Yusuf was able to fly the plane, #but he didn't fly the plane.'

(also in French, Greek, Russian, . . .)

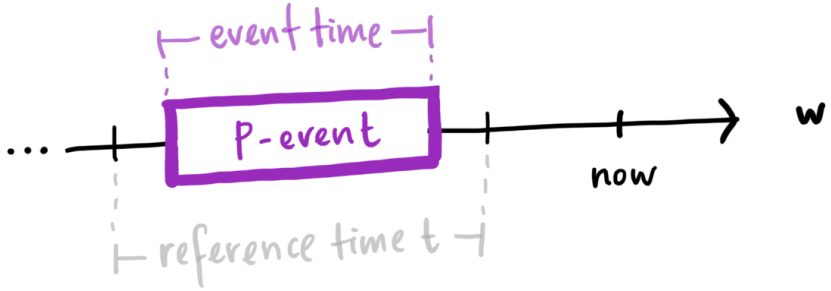
The problem of actuality

- **Ability** is (typically) analyzed as **circumstantial possibility**

  (26) $[\![\text{CAN}]\!]^{w,\text{CIRC}} := \lambda P \lambda e. \exists w' \in \text{CIRC}(w)[P(e)(w')]$

- Grammatical **aspect** instantiates an event in relation to reference time

  (27) $[\![\text{PFV}]\!] := \lambda w \lambda t \lambda P. \exists e[\tau(e) \subseteq t \,\&\, P(e)(w)]$ (Kratzer 1998)



- Composition at best predicts a **bounded time of possibility**

  (28) Yusuf could-PFV fly the plane
  $\sim \exists e[\tau(e) \subseteq t\{\prec t^*\} \,\&\, \exists w \in \text{CIRC}(w^*)[\text{fly-plane}(Y)(e)(w)]]$
  The relevant past interval contains an event of Yusuf flying a plane in some circumstantially accessible world

The problem of actuality

1. **The problem of ability**
   'Ambiguity' is systematic across languages, ability predicates (ability modals, English *be able*, Spanish *ser capaz*, . . .)

2. **The problem of modality**
   Actuality seems to erase the modality (possibility) of ability readings

3. **The problem of aspect**
   No obvious reason why temporal information or 'viewpoint' aspect should have an actualizing effect

Goal: A univocal treatment of ability attributions that derives the distribution of **pure ability** and **actuality**

A starting point: implicative *manage*

Observation: actualized ability is closer to managed than to did (Bhatt 1999)

(25) Yusuf havaii-jahaaz uṛaa **sak-aa**, #lekin us-ne havaii-jahaaz
Yusuf air-ship fly can-PFV.M.SG, #but 3SG-ERG air-ship
nahĩĩ uṛaa-yaa.
NEG fly-PFV.M.SG
'Yusuf was able to fly the plane, #but he didn't fly the plane.'

(29) ≡ Yusuf **managed** to fly the plane, #but he didn't fly the plane

- **Manage** and actualized **ability** also share a **projective inference:**

(30) a. Anjum **managed** / did not **manage** to ride a bike.
b. Anjum saikal (nahĩĩ) calaa **sak-ii**
Anjum cycle (NEG) drive can-PFV.F.SG
'Anjum was (not) able to ride a bike.'

$\rightsquigarrow$ *cycling was unexpected? abnormal? difficult?*

Actuality as implicativity?

Bhatt's hypothesis: ABLE ≡ **manage**

- **But:** no **pure ability** reading for **manage**

  (31) Yusuf **manages** to fly a plane, #but he never flies a plane.

- . . . even in an aspect-marking language (French **réussir**)

  (32) Yusuf { **réussissait** / **a réussi** } à piloter un avion,
  Yusuf { managed-IMPF / managed-PFV } to fly a plane,
  #mais il n'a pas piloté d'avion.
  #but he NEG-has NEG fly-PFV the-plane
  'Yusuf { used to manage / managed } to fly a plane, #but he did not fly a plane.'

Actuality entailments as implicative entailments:

1. Equivalence is analytical, not lexical (ABLE ≢ *manage*)
2. **Manage** seems closer to the **dispositional predicate**

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Implicative verbs

Manage belongs to a class of **implicative verbs** with a shared semantic template:

(A) Two-way **complement entailments**

(33) a. Ria **dared** to open the door. → *Ria opened the door*

b. Ria did not **dare** to open the door. → *Ria did not open the door*

(B) **Projective inference**

(33) Ria **dared** / did not **dare** to open the door.

⇝ *Opened the door required Ria to act bravely*

What semantic components produce this inference pattern?

The presupposition(s) of *manage*

What **manage** projects is surprisingly **hard to pin down:**

(Coleman 1975, Karttunen & Peters 1979, Baglini & Francez 2016, a.o.)

- common proposals like *intention, difficulty, unlikeliness* aren't universal

(34) a. **Without intending to,** Ms. Streisand [. . .] **managed** to synthesize the problem [. . .]
$\not\rightsquigarrow$ intention, $\not\rightsquigarrow$ difficulty, $\rightsquigarrow$ unlikelihood

b. By 1998, [. . .] gun manufacturers had **easily managed** to bypass the laws by making small alterations [. . .]
$\rightsquigarrow$ intention, $\not\rightsquigarrow$ difficulty, ? $\rightsquigarrow$ unlikelihood

c. The Socialdemokratiet **managed** to strengthen their position as Denmark's strongest political force **as expected** [. . .]
$\rightsquigarrow$ intention, ? $\rightsquigarrow$ difficulty, $\not\rightsquigarrow$ unlikelihood

What do these inferences have in common?

The implicative semantic template

Comparison with *dare* suggests that the presupposition is about a **prerequisite**

1. **Prerequisite relevance is presupposed** (projective, not at issue)

   (33) Ria { **dared** / did not **dare** } to open the door.
   $\rightsquigarrow$ *Opening the door required Ria to act bravely*

2. **Assertion resolves prerequisite status** (at issue)

   (33) a. Ria **dared** to open the door. $\rightarrow$ *Ria acted bravely*

   b. Ria did not **dare** to open the door. $\rightarrow$ *Ria did not act bravely*

3. **Complement entailments are derived as causal consequences**

   (33a) $\sim$ *Ria's bravery resulted in her opening the door* sufficiency

   (33b) $\sim$ *Ria's lack of bravery stopped her opening the door* necessity

Managing and *doing*

Manage to *P* presupposes the existence of a **causal prerequisite** for *P*

Reasoning about **non-triviality:** *P* is non-trivial if you can't **just** do it

- something additional (and prior) is **required** in order to do *P*
  (alternatively: some obstacle must be overcome *en route* to *P*) (Karttunen 2014)
- **causal necessity** and **causal sufficiency** derive complement entailments
- underspecification of the **causal prerequisite** captures **non-triviality**
- **causal background knowledge** fills in the details:

(35) Nur **managed** to meditate yesterday.

- *Context.* Nur is extremely busy with work lately
  $\rightsquigarrow$ *Finding/making time was required* (Finnish *joutaa*)

  (35) $\rightarrow$ Nur made the time (and consequently meditated)

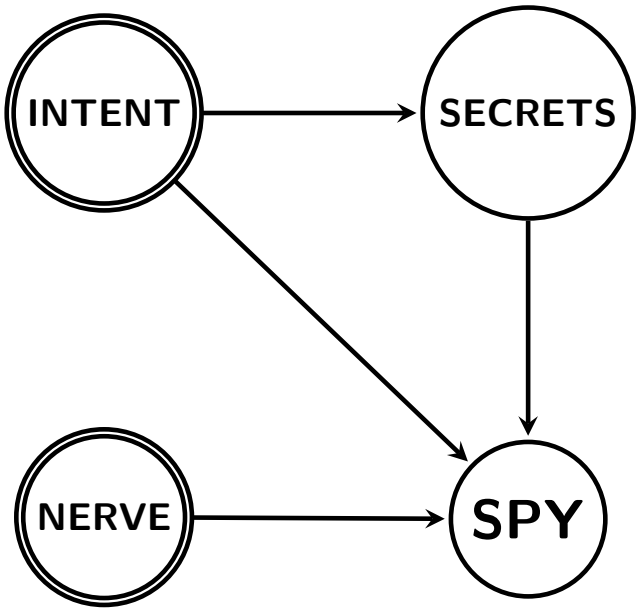
Implementation: causal network models (Pearl 2000)

Background. Captain Dreyfus was wrongly accused of spying for the Germans.

Relevant causal dependencies:

1. Collecting secrets requires treasonous intent
2. Spying (sharing secrets) requires treasonous intent, secret collection, risk-taking

A causal model for the Dreyfus affair: (finite graph + structural equations)

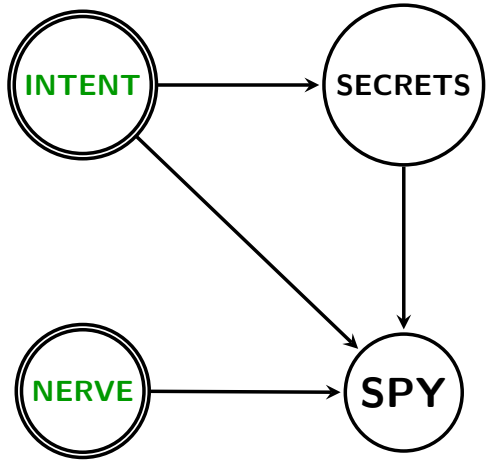


1. **SECRETS** := **INTENT**
2. **SPY** := **INTENT** $\wedge$ **SECRETS** $\wedge$ **NERVE**

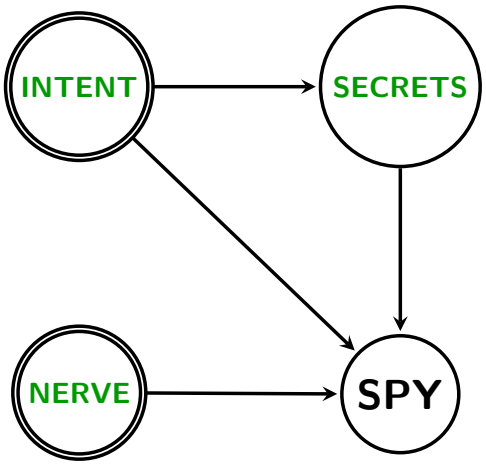
Reasoning with causal models

Use background information to reason out causal consequences:

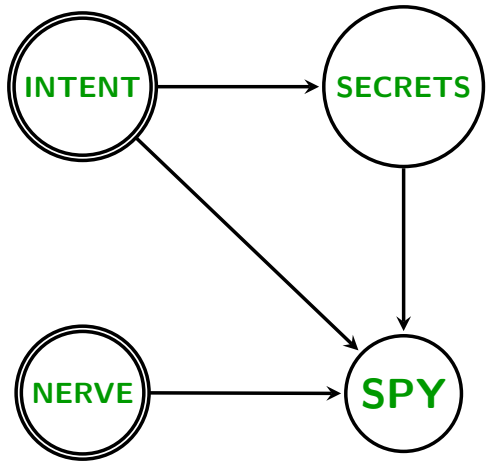
If **INTENT**, **NERVE** are **on**:



INTENT turns **SECRETS** **on**:



Which turns **SPY** **on** in turn:

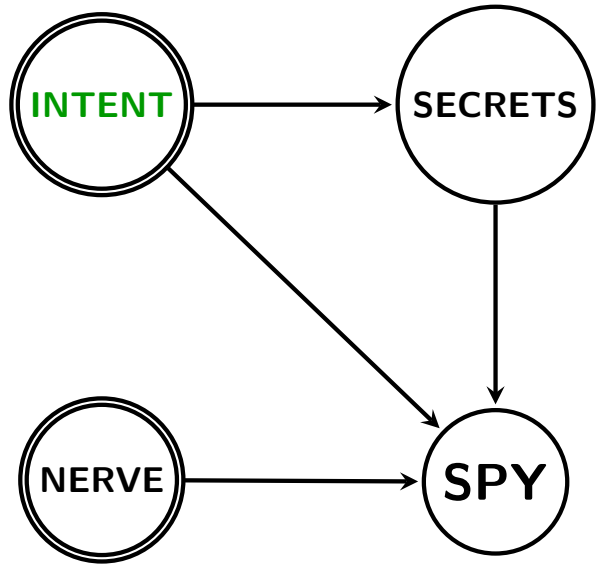


Causal dependence relations

Causal necessity, sufficiency are labels for different structural configurations:

- given a background situation s, a cause C is **causally necessary** for an effect E iff there's no (consistent) path from s to E which does not flip C

If we know that **INTENT** is **on**,
NERVE is **necessary** for **SPY**



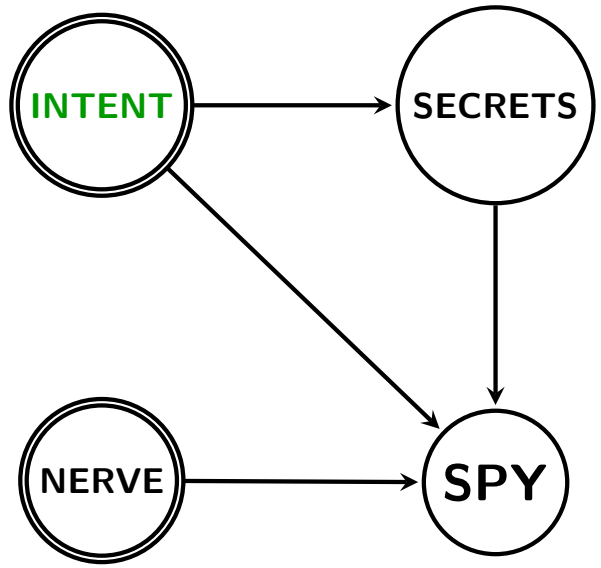
1. **SECRETS** := **INTENT**
2. **SPY** := **INTENT** $\wedge$ **SECRETS** $\wedge$ **NERVE**

Causal dependence relations

Causal necessity, sufficiency are labels for different structural configurations:

- given a background situation s, a cause C is **causally sufficient** for an effect E iff adding C to s guarantees E

If **INTENT** is **on**,
NERVE is **sufficient** for **SPY**



1. **SECRETS** := **INTENT**
2. **SPY** := **INTENT** $\wedge$ **SECRETS** $\wedge$ **NERVE**

Causal dependence relations

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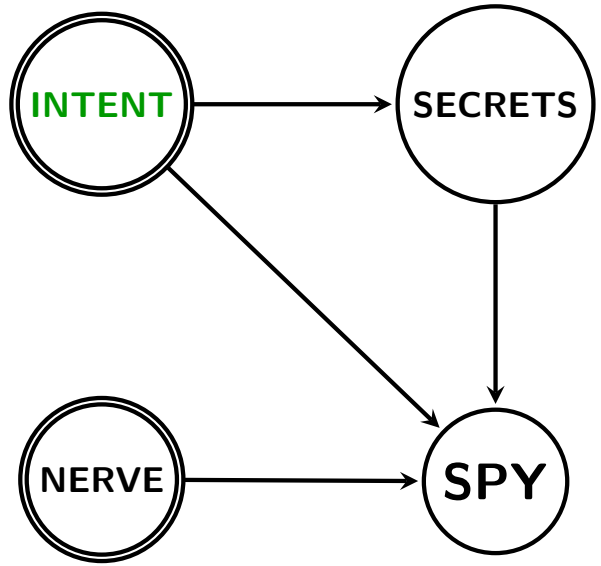
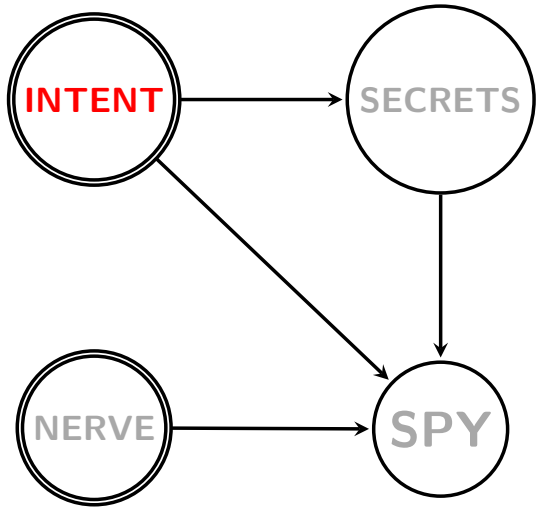
If **INTENT** is **on**,
NERVE is **sufficient** for **SPY**



This is the right kind of context for **dare**:

(36) a. Dreyfus **dared** to spy for the Germans.
b. Dreyfus did not **dare** to spy for the Germans.

Implicatives and causal dependence



In actuality, Dreyfus was loyal to France:

(36a) ??Dreyfus **dared** to spy.

requires: **NERVE** is **causally necessary, sufficient** for **SPY**

in context: NERVE is insufficient

(37) ??Dreyfus **managed** to spy.

requires: condition/s jointly **causally necessary, sufficient** for **SPY**

in context: no set of sufficient conditions

Interim summary: unpacking implicativity

Three key components work together to derive **implicative inferences:**

1. **presupposition:**
   the existence of an unresolved **jointly necessary & sufficient condition** (or set thereof) for the complement
2. **assertion:**
   determines the truth value of the **necessary & sufficient condition**
3. **modal flavour:**
   necessity & sufficiency are **causal**

$$[\![\mathit{manage}(P)(x)]\!]^{w,t} := \lambda e.(\iota A_{evt}.\forall w' \in \textsc{caus}(w,t)[\mathsf{IN}(t,w',A(x)) \leftrightarrow \mathsf{IN}(t,w',P(x))])(w)(e)^a$$

[a] Kaufmann (2013) outlines a procedure for mapping causal information from an SEM to the standard premise semantics format

Interim summary: taking stock

If actuality entailments are (analytically) **implicative:**

- the components emerge compositionally for **actualized ability**

$$\text{ABLE} + \text{PFV} \equiv \textbf{manage}$$

But: the gap is smaller for the **dispositional complex predicate**

- **happen to** has the implicative profile (Karttunen 1971, 2014)

(39) a. Ria **happened** to break the plate. → *Ria broke the plate*

b. Ria didn't **happen** to break the plate. → *Ria didn't break the plate*

⇝ *There was something she did (or didn't do) which (would have) resulted in breaking the plate.*

Choosy causal semantics for ability

Basic idea: **ability** attributing predicates (including *sak*) share the **causal background** of **manage** but differ in asserted content

(40) A statement of the form x *is able to / can* P

a. *Presupposes:* the existence of some action $A(x)$ which is **causally necessary/sufficient** for $P(x)$

b. *Asserts:* A is in x's **choice set** (doing A is a live option for x)

- *Background assumption:* agents have **choice sets** (sets of immediately available actions) at given world-time pairs

(41) $\forall w, t, x[A(x) \in \text{CH}(x, w, t) \rightarrow \exists w' \in \text{CIRC}(w)[\text{IN}(t, w', A(x))]]$
Actions in x's choice set at $\langle w, t \rangle$ *are possibilities for* x *at* $\langle w, t \rangle$

Choosy causal semantics for ability

Ability modals are stronger than circumstantial possibilities (Thalberg 1972, Kenny 1976, Cross 1986, Brown 1988, Belnap 1991, . . .)

- circumstantial possibility is licensed by single witnesses, but **ability** is not

(42) *Context:* Rookie Tara makes a hole in one during the reference interval

a. ??Tara **can** (has the ability to) make a hole in one.

b. ??Taaraa hole in one kar **sak-tii** hai
??Tara hole in one do can-IMPF.F.SG be.PRS.SG
'Tara has/had the ability to make a hole in one.'

- **Upshot:** ability is a **hypothetical guarantee** (cf. Mandelkern et al 2017)
Agent x is able to P at $\langle w, t\rangle$ if x can choose the final cause of $P(x)$

$$[\![\text{ABLE}(P)(x)]\!]^{w,t} :=$$
$$(\iota A.\forall w' \in \text{CAUS}(w,t)[\text{IN}(t,w',A(x)) \leftrightarrow \text{IN}(t,w',P(x))])(x) \in \text{CH}(x,w,t)$$

Getting from ability to actuality: an overview

The **ability** semantics make it a special stative: a **dynamic capacity attribution**

(44) Juno is loud/fast/tactful.
Juno is capable of actions which are loud/fast/tactful.

Dynamic capacities have distinctive interactions with grammatical aspect
(key data from French)

- Imperfective requires consistency through reference period (non-uniform)

(45) Juno **était** rapide.
Juno was.IMPF fast
'Juno was (generally) fast.'

- Perfective is interpreted as **manifestation**

(46) Juno **a été** rapide.
Juno was.PFV fast
'Juno was (did something) fast.'

Getting from ability to actuality: an overview

Enough constructions as specific abilities (compare *dare* to *manage*):

(47) Juno was fast enough to win the race
$\sim$ *Juno can win the race, in view of her capacity for speed*[3]

(48) a. Juno était assez rapide pour gagner la course
Juno was-IMPF enough fast for win the race
'Juno was fast enough to win the race.'

b. Juno a été assez rapide pour gagner la course
Juno was-PFV enough fast for win the race
'Juno ran fast enough to win the race.' $\rightarrow$ *She won*

Aspectual coercion: PFV selects **eventives** (Moens & Steedman 1988, Bary 2009)

- robust evidence for *inchoative* and *complexive/maximalizing* forms of coercion
- **evidential** coercion (as in 48b) reported previously as *dynamic, actualistic inchoative* (de Swart 1998, Fernald 1999, Homer 2011/2021, Nadathur 2019/2023)

[3] *Juno's actual speed (capacity) is at least as great as the minimum necessary speed required for race-winning* (becomes sufficient as the final necessary complement cause; Nadathur 2023a)

Getting from ability to actuality: an overview

Upshot: if ABLE/*sak* is a **dynamic stative**, PFV-triggered **coercion** levels the contrast with *manage*

(49) Yusuf gaaṛii calaa **sak-aa**
Yusuf car drive can-PFV.M.SG
'Yusuf managed to drive the car.'

a. *Presupposes:* Some action by Yusuf was the final cause of car-driving
$\exists A : \forall w' \in \text{CAUS}(w, t)[\text{IN}(t, w', A(Y)) \leftrightarrow \text{IN}(t, w', \text{drive-car}(Y))]$

b. *Base assertion:* The proximate cause was in Yusuf's (local) choice set
$A(x) \in \text{CH}(Y, w, t)$ (stative)

c. *With coercion + PFV:* Yusuf chose (acted on) the proximate cause
$\text{IN}(t, w, A(Y))$

d. **Entailed result:** Yusuf drove the car
$\text{IN}(t, w, \text{drive-car}(Y))$

Outline of the talk

1. Introduction
2. The dispositional complex predicate: towards an analysis
3. From standard ability to implicativity
4. Causal semantics for implicativity
5. Implicative structure for the dispositional complex predicate
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Le as an implicative

Recall the proposal sketch for the **dispositional complex predicate:**

(22) **Proposal sketch:**
Given predicate P and agent x, *le*$(P)(x)$ presupposes that some (prior) choice by x is **necessary** and **sufficient** to **bring about** $P(x)$. *Le*$(P)(x)$ asserts that x made (acted on) this choice.

(1a) Anjum gaaṛii calaa **le-tii** (hai).
Anjum car drive take-IMPF.F.SG (be.PRS.SG)
'Anjum will/does drive the car.' (Anjum (can and) does drive the car)

This looks a lot like **manage**, or actualized **ability**:

(50) $[\![\text{le}(P)(x)]\!]^{w,t} := \lambda e.(\iota A_{vt} \in \text{CH}(x, w, t).\forall w' \in \text{CAUS}(w, t)$
$[\text{IN}(t, w', A(x)) \leftrightarrow \text{IN}(t, w', P(x))])(w)(e)$

$\sim$ *Agent x chooses the proximate cause of* $P(x)$

Le as an implicative

Eventives get **habitual** readings under **imperfective**:

- eventive $P \mapsto$ predicate of *relevant times* when P is instantiated
- First pass at HAB: relevance specified via salient pred. R, which picks up presuppositions of eventive P (cf. Schubert & Pelletier 1989 on GEN)

(51) $[\![\text{HAB}]\!] := \lambda w \lambda t \lambda R \lambda P. \forall t' [t' \subset t \,\&\, R(w)(t')][\text{IN}(t', w, P)]$

(52) $[\![\text{IMPF}(\text{HAB}(\text{le}(P)(x)))]\!] =$
$\lambda w \lambda t. \exists t [t \supset t^* \,\&\, \forall t' [t' \subset t \,\&\, \iota A \in \text{CH}(x, w, t). \forall w' \in \text{CAUS}(w, t')$
$[\text{IN}(t', w, A(x)) \leftrightarrow \text{IN}(t', w', P(x))]][\text{IN}(t', w, A(x))]$

All situations in which x has a choice which is necessary/sufficient for P are ones in which x acts on this choice

(53) agar raastaa pakkaa ho, Anjum saikal calaa **le-tii** hai
if road correct be, Anjum cycle drive take-IMPF.F.SG be.PRS.SG

'If the road is good, Anjum rides a bicycle.'

When the road is good, Anjum has a choice which is necessary/sufficient for her to ride a bike, and she makes this choice.

Le as an implicative

Eventive **le predicate** combines straightforwardly with **perfective**:

(54) $[\![\text{PFV}(\text{le}(P)(x))]\!] = \exists e[\tau(e) \subseteq t \,\&\, (\iota A \in \text{CH}(x, w, t).\forall w' \in \text{CAUS}(w, t)$
$[\text{AT}(t, w', A(x)) \leftrightarrow \text{IN}(t, w', P(x))])(w)(e)]$

Agent x had a choice which was causally necessary and sufficient for realizing P within reference time and acted on that choice

(1b) Anjum-ne gaaṛii calaa **l-ii**.
Anjum-ERG car drive take-PFV.F.SG

'Anjum drove the car.' (Anjum chose to drive the car)

Anjum had a choice which was necessary/sufficient for her to drive, and she made this choice (so she drove)

- **Prediction:** this should only be appropriate in contexts that support the causal presupposition. (Easily accommodated for agentive behaviours)
- The presupposition contributes to the volitionality effect, by establishing that the agent *chose* to bring about a *P* event

Three complications

1. If *le* ≡ *manage*, the following **should share an interpretation:**

(55) Anjum **managed** to drive a car.

(2b) Anjum gaaṛii calaa **sak-ii**
Anjum car drive can-PFV.F.SG
'Anjum was able to drive the car.'

(1b) Anjum-ne gaaṛii calaa **l-ii**.
Anjum-ERG car drive take-PFV.F.SG
'Anjum drove the car.' (Anjum chose to drive the car)

- (1b) seems weaker than (55) and (2b): *P* is still non-trivial, but easier than *manage* and *sak* suggest
- Choosy (or *stit*; Belnap & Perloff 1988) semantics seems right for *le*
- **Maybe:** right analysis for **le**, and something missing from the *manage* semantics to capture more robust non-triviality[4]

[4] E.g., Alonso-Ovalle & Hsieh (2021) on anti-expectation semantics for Tagalog AIA form

Three complications

2. Complex **le** predicates are **not compatible with negation**[5]

(56) a. *us-ne gaanaa nahĩĩ gaa **li-yaa**
3SG-ERG song NEG sing take-PFV.M.SG
Intended: 'He didn't (choose to) sing a song (completely).'

b. *vo gaanaa nahĩĩ gaa **le-taa**
3SG-ERG song NEG sing take-IMPF.M.SG
Intended: 'He doesn't/won't (choose to) sing songs.'

- If *le* ≡ *manage*, no explanation for (56)
- An **explanation sketch from Singh (1990):**
  Light verbs focus points of inception/completion and instantiate full main predicate event; negation targets the event, so inception/culmination points do not exist

[5] Well-reported previously for *le-* and other light verb perfectives (Singh 1990, Butt 1993).

Three complications

3. How does the **culmination contrast** arise?

(7) a. Maayaa-ne biskaṭ khaa-**yaa** lekin use puuraa nahĩĩ
Maya-ERG cookie eat-PFV.M.SG but it.ACC whole NEG
khaa-yaa
eat-PFV.M.SG
'Maya ate the cookie but did not finish it.'

b. Maayaa-ne biskaṭ khaa **li-yaa**, #par use puuraa nahĩĩ
Maya-ERG cookie eat take-PFV.M.SG, #but it.ACC whole NEG
khaa-yaa.
eat-PFV.M.SG
'Maya ate the cookie, #but did not finish it.'

- **Previously:** simple PFV has modal semantics, complex *le* PFV has the 'standard' culminating meaning
- **So:** if *le* only establishes that $P(x)$ was chosen/caused, non-culminated reading predicted
- **Suggestion:** non-culmination comes from main verb semantics, not PFV

Towards a resolution

Idea: *le* causal structure **merges with event structure of main predicate**

- Aspectual **light verbs are not clause embedding:** evidence from scrambling (below), control, and modification (Butt 1993)

(57) a. anjum-ne [likh **li-yaa**] patr.
Anjum-ERG [write take-PFV.M.SG] letter
'Anjum wrote a letter.'

b. *anjum-ne likh patr li-yaa.
anjum-ERG write letter take-PFV.M.SG
'Anjum wrote a letter.'

- *Butt, Isoda & Sells (1990):* light verbs introduce **transparent event** structures whose arg structure, *Aktionsart* get fused with main pred structure
- *Butt (1993):* transparent *le*-event is specified for volition agents and endpoints (doesn't merge with main verbs with conflicting specs)

Towards a resolution

Idea: Predicates merge (in constrained ways) into an **accomplishment event structure** (cause, process, result) (Butt & Ramchand 2003)

- **Le** instantiates cause (+VOL), main verb process and/or result

How might fusion work on the implicative analysis?

- **Telic** main verbs have **internal causal structure**, denotation incl. non-culminated events: (Nadathur & Filip 2021, Nadathur & Bar-Asher Siegal 2022): n/s presupposition forces initiation to guarantee culmination
- **Atelic** main verbs wind up **closer to manage:** activity is produced (only) by conscious choice

(58) *Acceptable in context:* Dancing in the Taj is forbidden, but Anjum really wanted to

Anjum-ne Taaj Mahaal-mein naac **li-yaa**
Anjum-ERG Taj Mahal-IN dance take-PFV.M.SG

'Anjum managed to dance in the Taj Mahal.' (R. Bhatt, p.c.)

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Summary

Observation: a parallel in the aspectual behaviour of two ability constructions

- PFV in both cases eliminates modality detectable with IMPF

Shared semantics: *le* and *sak* share causal background structure with *manage*

- *Shared presupposition:* action/choice is **causally necessary/sufficient** for target
- *Divergent assertion:* *sak*/ABLE asserts capacity (stative), *manage/le* realizes cause (eventive)
- Modal 'flattening' is an illusion: aspectual effects are predicted by *Aktionsart*

Implicativity and event structure:

- Aspectually and structurally: *le* $\sim$ *manage*, **but** *le* fuses with embedded predicate
- **Looking ahead:** 'true' implicatives vs. 'implicative' light verbs may offer support for a complex causal view of event structure (Baglini & Bar-Asher Siegal 2021, Nadathur & Bar-Asher Siegal 2022, Nadathur 2024)

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