# Making a statement: eventuality denoting nominals

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# Introduction: Data

(1) a. Alex's two allegations that Cal lied and Dom swore were true.
b. Alex and Billie's two allegations here at exactly 2:03pm that Cal lied upset Dom.
c. #Alex's two allegations here at exactly 2:03pm that Cal lied upset Dom.

(2) a. Alex's two beliefs that Cal's birthday is tomorrow and Dom's is on Friday are why she went shopping.
b. ?Alex and Billie's two beliefs that Cal's birthday is tomorrow are why they went shopping.
c. #Alex's two beliefs that Cal's birthday is tomorrow are why she went shopping.

# Outline & Goals

1. Develop novel linguistic tests to identify which (polysemous) common nouns (CN's) can denote eventualities. Focus on 'abstract' CNs.
   - E.g., *allegation*, *belief*, *fear*, *statement*

2. Extend the use of tests familiar in event semantics to categorise CN's that are eventuality-denoting into aspectual classes.
   - I.e. *allegation*, *statement* (EVENTS) vs. *belief*, *fear* (STATES)

3. Derive predictions regarding the felicitous use of polysemous CN's with an eventuality-denoting sense in numeral constructions as a function of:
   - what senses they have
   - the aspectual class of the eventuality-denoting sense

# Background: Denotations of Common Nouns (CNs)

Traditional view:

- 'Concrete' CNs denote properties of type $\langle s, \langle e, t \rangle \rangle$
  - *boat*, *cat*
- For 'abstract' CNs, less work, more piecemeal progress:
  - eventualities (e.g., Grimm 2014; Zamparelli 2020);
  - tropes (e.g., Moltmann 2004; Nicholas 2010)
  - *informational entities* (incl. propositions) (e.g., Sutton and Filip 2019, 2020). Henceforth INF-ENTITIES

The eventualities view for all CNs:

- Schwarzschild (2022): All CNs denote STATES
  - e.g., *boat* denotes a STATE (with physical boats as participants)
  - First considered, but not endorsed by Parsons (1990, §10.6)

We should distinguish whether a CN denotes an eventuality, and if so, what kind?

# Introducing two diagnostic tests

Two diagnostic tests: Which common nouns denote eventualities?

1. the light verb construction test: LVC test
2. the genitive construction test: GC test

separate two classes of CNs:

- *allegation*, *belief*, *party*, ...
- *boat*, *cat*, *fact*, *information*, ...

Evidence from English (mains slides) and Czech (appendix), further expansion crosslinguistically is planned

# The Light Verb Construction (LVC) Test

If a CN can be felicitously used in a LVC, it has at least one sense in which it denotes (a set of) eventualities.

- In LVCs the verb is semantically bleached of its 'ordinary' meaning (e.g., Pullum and Huddleston 2002, ch. 4, §7)

(3) a. Alex made that {allegation | claim | statement}. +LVC
b. Alex had that {belief | fear | hope | party}. +LVC

(4) a. Alex {gave someone | had} that {fact | information}. −LVC
b. Alex {made | had | took | gave someone} that {boat | cat}. −LVC

# Genitive Constructions and Eventualities

Genitive constructions and connections to Thematic Roles of eventualities:

- Chomsky 1970; Ehrich and Rapp 2000; Fanselow 1981; Grimshaw 1990; Selkirk 1977, a.o.

# The Genitive Construction Test (English)

In a Saxon Genitive Construction, *A*'s *B*, if *B* denotes an eventuality, then *A* can be a participant (e.g., Agent, Theme, Experiencer, Instrument etc.), in that eventuality.

(5) a. Alex's allegation/claim/party $\approx$ the EVENT of alleging/claiming/partying to which Alex stands in the Agent relation
b. Alex's belief/fear/hope $\approx$ the STATE of belief/fear/hope to which Alex stands in the Experiencer relation

} EV-denoting

(6) a. Alex's information $\not\approx$ the information STATE (or EVENT) in which Alex is the Experiencer/Agent/Theme/Instrument/Stimulus.
b. Alex's boat/cat $\not\approx$ the boat/cat STATE to which Alex stands in the Experiencer/Instrument/Theme/Stimulus etc. relation

} not EV-denoting

For the GCs in (5): Relation between A and B is constrained and delimited by the lexical semantics of the CN

For the GCs esp in (6-b): Totally open-ended what this relation is

## The two tests crosslinguistically

- Czech patterns the same as English (Appendix, Paper)
- Early indications that the tests also work for German, and Romance languages (French, Italian, Spanish)

# Summary: Denotations of CNs

Our two diagnostic tests partition CNs into two classes

1. Those that do not denote eventualities
   - E.g., *boat*, *cat*, *fact*, *information*
2. Those that can denote eventualities
   - E.g., *allegation*, *belief*, *fear*, *hope*, *party*, *statement*

Next step: Deeper dive into eventuality-denoting CNs

- Classification into aspectual classes
- Question: What impact does aspectual class have on countability for these CNs?

# Tests for aspectual classes

Tripartite distinction of aspectual classes into EVENTS, PROCESSES or STATES (Mourelatos, 1978)

- Diagnosed by battery of tests from event semantics (e.g., Dowty 1979)
- Some care needed in application (e.g., Filip 2019)

(7) Telic (EVENTS)
  a. Alex jogged to campus in 30 mins / ?for 30 mins.
  b. Alex jogged to campus three times / (?)a lot (last week).

(8) Atelic (PROCESSES)
  a. Alex jogged for 30 mins / ?in 30 mins.
  b. Alex jogged a lot / ?three times.

(9) Atelic (STATES, especially non-episodic)
  a. Alex was a doctor for 35 years / ?in 35 years.
  b. Alex was a doctor ?a lot / ?three times.

Our plan: Use these diagnostic tests on LVCs to classify aspectual classes of eventuality-denoting CNs

# Aspectual classes of Eventuality-Denoting CNs

*statement* and *allegation* pattern as EVENT-denoting

(10) a. Alex made that {statement | claim | allegation} {in under 2 minutes | (?)for 2 minutes/hours}.
b. Alex made that {statement | claim | allegation} {three times | (?)a lot}.

*belief* and *hope* pattern as STATE-denoting

(11) a. Alex had that {belief | hope} {?in 5 years | for 5 years (while in grad school)}.
b. Alex had that {belief | hope} {?three times | ?a lot}.

Interestingly, no cases of LVCs that suggest that eventuality-denoting CNs denote (sets of) PROCESSES

- In the following, only discussing EVENTS and STATES, setting PROCESSES aside.

# Diagnostic tests: Summary

Table: Results of applying our tests: whether nouns denote eventualities. Not eventuality denoting, EVENT-denoting, STATE-denoting. EV = EVENTS; ST = STATES.

| Noun | boat | cat | fact | information | allegation | claim | party | statement | belief | hope | fear |
|---|---|---|---|---|---|---|---|---|---|---|---|
| LVC test | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| GCC test | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Eventuality (if any) | – | – | – | – | EV | EV | EV | EV | ST | ST | ST |

# Numeral constructions for eventuality-denoting CNs: Main claims

Expands empirical coverage in Sutton and Filip (2019) and Sutton and Filip (2020), also that of Grimm (2014)

1. EVENT-denoting senses of CNs are typically countable (e.g., we can count *allegation* qua its EVENT-denoting senses)
   - What counts as 'one' such EVENT depends on anchoring relations to e.g., Agents, Themes, or spatio-temporal locations;
2. STATE-denoting senses of CNs are not countable
   - Mourelatos 1978 wrt ATELIC:MASS-TELIC:COUNT
   - Mass-to-count coercion possible via anchoring, e.g.:
     - *?three fears* $\approx$ 'three fear stimuli'
3. INF-ENTITIES in the denotations of polysemous CNs such as *belief* are typically countable, and do not need anchoring.
   - even CNs with a (mass) STATE-denoting sense can be countable on their INF-ENTITY denoting sense
   - Polysemy not taken into account by Mourelatos 1978

# Assumptions

## STATES more restricted than EVENTS in possible Thematic Roles

- EVENTS may be defined for the full range of thematic roles; and are homomorphically mapped to their temporal traces (Krifka, 1989)
- STATES may be defined only with respect to *Experiencer*, *Instrument*, and *Theme* (Parsons 1990)

## Grammatical Counting based on Quantization (relative to a context)

- Grammatical counting turns on enumerating quantized sets of entities relative to a context (we suppress details regarding contexts below).
- Quantized sets have no two members in a proper part relation: $QUA(P) \leftrightarrow \forall x, y[(P(x) \wedge P(y)) \rightarrow \neg x \sqsubset y]$ (see Krifka 1989).E.g.,
  - $QUA(\{a, b, c\})$, $QUA(\{a \sqcup b, b \sqcup c\})$
  - $\neg QUA(\{a \sqcup b, b\})$

# Anchoring EVENTS

The cardinality of a set of EVENTS in the denotation of a CN supervenes on the cardinality of a set of anchors[1]

- *two allegations* denotes two EVENTS only if there is a quantized set of two Agents, two temporal traces, or two locations.

(12) $ANCH(e_v, \mathcal{P}_{\langle v,t\rangle}, f_{\langle v,e\rangle}) \stackrel{\text{def}}{=} \lambda x.\exists e'[e' \sqsubseteq e \wedge \mathcal{P}(e') \wedge f(e') = x]$, where $f \in \{\text{AG}, \text{TH}, \tau, \text{LOC}\}$
The set of anchors of a sum eventuality $e$ relative to an anchoring relation $f$ and an eventuality-denoting predicate $\mathcal{P}$ is the set of $f$-participants of the $\mathcal{P}$-parts of $e$.

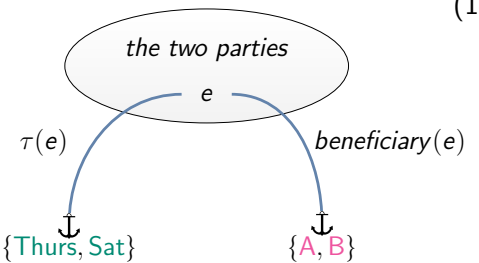
(13) $\mu_{ev}(e_v, \mathcal{P}_{\langle v,t\rangle}, f_{\langle v,e\rangle}) \stackrel{\text{def}}{=} |ANCH(e, \mathcal{P}, f)|$ if $QUA(ANCH(e, \mathcal{P}, f))$, $\perp$ otherwise.
A sum eventuality $e$ counts as $n$ $\mathcal{P}$s relative to anchoring relation $f$ iff the cardinality of the set of $f$ anchors of $e$ for $\mathcal{P}$ is $n$, presupposing that this set is quantized.

[1] Origins in Davidson 1969: we can identify eventualities in terms of the objects to which they are related. See also Krifka 1989 wrt incremental themes. *Participant Anchoring* for abstract CNs coined by Grimm 2014

# Anchoring EVENTS Example: *party*

Cardinality of *party*-EVENTS supervenes on cardinalities of participants via anchoring:

- *party*-qua-celebration has an EVENT-denoting sense, per our diagnostic tests




(14) a. I attended the two parties on Thursday and Saturday.

b. The two simultaneous parties for Alex and Billie's defences here at 2pm were attended by the same people.

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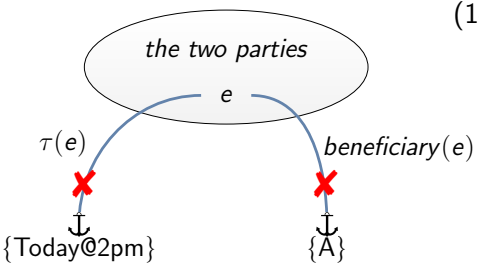



(14) a. I attended the two parties on and Thursday and Saturday.

b. The two simultaneous parties for Alex and Billie's defences here at 2pm were attended by the same people.

c. #The two simultaneous parties for Alex's defence here at 2pm were attended by the same people.

# Anchor Blocking

Polysemy blocks the use of an anchor: We cannot anchor a given sense of a CN via the lexical material of another sense of that CN.

- If N is polysemous between senses S1 (EVENTS) and S2 (e.g., INF-ENTITIES), then *S2* cannot anchor *S1*.

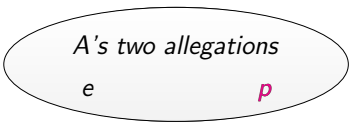
*allegation* is EVENT/INF-ENTITY polysemous

- INF-ENTITY sense of *allegation* can be counted directly
- EVENT sense of *allegation* needs anchoring
- *allegation* INF-ENTITIES are the Themes of *allegation* EVENTS
- Anchor blocking means that we cannot count *allegation*-EVENTS in terms of what is alleged (INF-ENTITIES)

# Anchor Blocking: *allegation*

Cardinality of *allegation*-INF-ENTITIES can be counted directly

(15) [Context: A stated] '*B and C both lied*'.




(16) a. A's (one) allegation was true.
$|p| = |\{lie(b) \wedge lie(c)\}| = 1$

b. A's two allegations were true.
$|p| = |\{lie(b), lie(c)\}| = 2$

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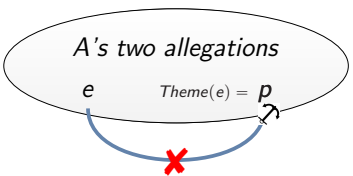


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$|p| = |\{lie(b) \wedge lie(c)\}| = 1$

b. A's two allegations were true.
$|p| = |\{lie(b), lie(c)\}| = 2$

c. #A's two allegations each took a few seconds.

Cardinality of *allegation*-EVENTS supervenes on cardinalities of anchors

- $e$ and $p$ part of the meaning of *A's two allegations*. $p$ is Theme of $e$.
- Anchor blocking prevents using the INF-ENTITY ($p$) as an anchor for $e$
- Casting the anchor inside of the boat (CN's meaning) cannot anchor the boat

# EVENT-denoting CNs: *allegation*

Recall EVENT-anchoring assumption:

- The cardinality of EVENT-denoting senses of CNs supervene on cardinalities of quantized anchor sets.

(17) a. Alex's two allegations that Cal lied and Dom swore were true.
- counting 2 INF-ENTITIES directly

b. Alex and Billie's two allegations here at exactly 2:03pm that Cal lied upset Dom.
- counting 2 EVENTS, anchoring to Agents

c. #Alex's two allegations here at exactly 2:03pm that Cal lied upset Dom.
- both EVENT and INF counting is ruled out

# STATE-denoting CNs: *fear*

Unlike for EVENT-denoting CNs, CNs that only denote STATES are (typically) mass (see Mourelatos (1978))

- E.g., *fear* denotes STATES (of being in fear) and is mass.
- Mass nouns have cumulative reference Quine (1960), and singular mass nouns e.g., *fear* can denote sums of states

(18) a. Alex and Billie's fear of spiders and long flights are why they won't travel to Australia.
   - mass singular *fear* denotes a sum of A's and B's *fear*-STATES

b. ?Alex's two fears of spiders and long flights are why she won't travel to Australia.
   - attempting to anchor STATES to Stimuli results in coercion

# Interactions with polysemy: *belief*

*belief* is INF-ENTITY/STATE polysemous

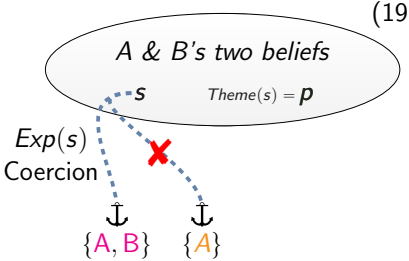
- The INF-ENTITY sense (the Theme of the STATE) is countable without anchoring[2]
- E.g., *three beliefs* = 'three informational entities/propositions', that which is (or could be) believed

A more nuanced take on ATELIC:MASS-TELIC:COUNT

- Mourelatos (1978) did not account for polysemy
- Some STATE-denoting nouns can be count nouns if they are polysemous and the other sense is countable

[2] For why some INF-ENTITY denoting nouns are mass, see Sutton and Filip 2019, 2020

# Polysemous STATE-denoting CNs: *belief*




(19) a. Alex's two beliefs that Cal's birthday is tomorrow and Dom's is on Friday are why they went shopping.
$|p| = |\{bday(c, t_1) \wedge bday(d, t_2)\}| = 2$

b. ?Alex and Billie's two beliefs that Cal's birthday is tomorrow are why they went shopping.

c. #Alex's two beliefs that Cal's birthday is tomorrow are why they went shopping.

# Contrast with Grimm's *participant anchoring*

## Analysis of e.g., *hopes, fears, despairs, prides*

### Grimm 2014

- EVENTS are, by hypothesis discrete and don't need anchoring
- *anchoring* primarily for 'count' uses of STATE-denoting nouns
- *pride, despair* etc. are count/mass polysemous or have count 'extended uses'
  - anchoring explains the connection between mass and count uses/senses

### Us

- Cardinalities of EVENTS supervene on cardinalities of anchor sets
- *anchoring* primarily for EVENT-denoting nouns
- *pride, despair* etc. are mass, but can be coerced[3]
  - ??her three prides, ??his two despairs

[3] *hopes and despairs* analogous to a coerced *interruption reading* common for states denoted by individual-level predicates: e.g., *Francis is occasionally blond* (Fernald, 2000, p.70) does not involve coercion to episodic EVENTS.

# Summary & Conclusions

## New diagnostic tests

- Novel LVC and GC tests to classify CNs that have an eventuality-denoting sense
- Tests adapted from event semantics categorise their aspectual class

## Countability and abstract nouns

- Counting with the eventuality-denoting senses of CNs requires *anchoring* to thematic roles. Aspectual class constrains what anchors are available.
- We can motivate why the EVENT-denoting senses of *allegation* and *party* are easily countable and why this prompts coercion for STATE-denoting senses of *belief* and *fear* (contra Grimm 2014)

## Importance of polysemy

- Not all STATE-denoting CNs are uncountable; e.g., *belief* is countable when its INF-ENTITY-denoting sense is selected;
- Anchor blocking: an INF-ENTITY sense of a CN cannot anchor its EVENT-denoting sense; e.g., *allegation*-EVENTS cannot be anchored to *allegation*-INF-ENTITIES

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# How 'bleached' are LVCs

## General pattern

- *have that N* $\mapsto$ STATE (e.g., *had that belief for many years*)
- *make that N* $\mapsto$ EVENT (e.g., *made that statement in (under) 3 minutes*)

## Suspicion:

- The semantics of the light verb determines the aspectual class
- Two reasons to reject the suspicion

## Associatated verbs

- Pattern almost exactly with eventuality denoting CNs
  - *state that p*, *give the statement that p* (EVENT)
  - *believe that p*, *have the belief that p* (STATE)
- A remarkable coincidence if the LV determined the aspectual class of the LVC

## Mapping not determinate

- *have that idea* and *make that assumption* are polysemous
  - *Alex has had that idea/made that assuumption for many years* (STATE)
  - *Alex just had that idea/made that assumption* (EVENT)
- So LVs *have* and *make* allow for variation in aspectual class

# LVC test for Czech

(20)a. Alex udělal toto {prohlášení | tvrzení}. +LVC
Alex do.PAST this {statement | claim}.
'Alex made this {statement | claim}.'

b. Alex měl {tento strach | tuto domněnku / pařbu / naději}. +LVC
Alex have.PAST {this fear | this belief / party / hope}
'Alex had this {fear | belief | party | hope}.'

(21)a. Alex {dal někomu | měl} {tento fakt | tuto informaci}. −LVC
Alex {gave.PST someone | have.PST} {this fact | this information}
'Alex {gave someone | had} this {fact | information}.'

b. Alex {dal někomu | měl} tuto {lod' | kočku}. −LVC
Alex {gave.PST someone | have.PAST} this {boat | cat}
'Alex {gave someone | had} this {boat | cat}.'

# The Genitive Construction Test (Czech)

In a Genitive Case Construction *A*.GEN *B*, if *B* denotes an eventuality, then *A* can be a participant (e.g., Agent, Theme, Experiencer, Instrument etc.) in that eventuality.

(22) a. Alexův {argument | večírek}
Alex.M.GEN {argument | party}
Alex's {argument | party}

b. Alexova {víra | naděje}
Alex.F.GEN {belief | hope}
Alex's {belief | hope}

} EV-denoting

(23) a. Alexova informace
Alex.F.GEN information
Alex's information

b. Alexova {lod' | kočka}
Alex.F.GEN {boat | cat}
Alex's {boat | cat}

} not EV-denoting

Patterns just as with English, e.g.:

- *Alexův argument* $\approx$ the argument EVENT to which Alex stands in the Agent relation
- *Alexova lod'* $\not\approx$ the boat STATE to which Alex stands in the Experiencer/Instrument/ Theme/Stimulus etc. relation

# Contrast with Grimm's *participant anchoring*

Grimm's (2014) claims re Psych Nouns:

- 'EVENTS are by hypothesis, discrete' (p. 196)
- Nouns such as *despair* are polysemous insofar as they 'may also permit additional event-based readings, which are countable' (p.197)

(24) ...his deep glooms, his despondencies, his despairs

## Contrast with Grimm's *participant anchoring* cont.

(24) ...his deep glooms, his despondencies, his despairs

We disagree:

- EVENTS are not by hypothesis, discrete. Predicates of EVENTS must be anchored to suitable participants to allow counting
- Nouns such as *despair* are not (relevantly) polysemous. They denote STATES, and are not felicitous in numeral constructions:

(25) ??his three deep glooms, ??four despondencies, ??five despairs

- Plural uses such as (24) are coerced via anchoring to discrete intervals (e.g., denoting discrete intervals of despair)
- Analogous to a coerced *interruption reading* common for states denoted by individual-level predicates: e.g., *Francis is occasionally blond*, which, however, does not involve coercion to episodic EVENTS (Fernald, 2000, p.70)