Variable linking in argument structure

Yale Syntax Reading Group

Eva Neu, UMass Amherst
eneu@umass.edu, `eva-neu.github.io`
December 6, 2024

1. Setting the stage: Variable unaccusativity

In this section, I will...

- Review some basic data on variable unergative/unaccusative behavior;
- Contrast variable unaccusativity with the causative-inchoative alternation.

1.1. Variable unaccusativity

Ever since the Unaccusativity Hypothesis was proposed, it has been observed that some verbs can pass both unergative and unaccusative diagnostics with certain systematic differences in interpretation (Borer, 2005; Perlmutter and Postal, 1984; Sorace, 2000, 2004, 2011, among many others).

- Example 1: Auxiliary selection in Western Germanic and Romance
  - Unergatives select 'have,' unaccusatives select 'be'
  - Changing the telicity of a sentence can cause the verb to switch behavior

(1)   a.   De bal **heeft**/***is** gerold.
           the ball **has**/**is**   rolled
           'The ball rolled.'   *unergative*

         b.   De bal **is**/***heeft** naar beneden gerold.
           the ball **is**/**has**   to   down   rolled
           'The ball rolled downstairs.'   *unaccusative*

                                                        (Sorace, 2000:876)

- Example 2: Closest Conjunct Agreement in Russian
  - Unergatives do not, unaccusatives do allow for CCA
  - Changing the animacy status of the argument allows the verb to switch behavior

(2)   a.   *Na lestničnoj ploščadke stojal   sosed   i   ego brat.
           on stairway   landing   stood.**MSG** neighbor.**MSG.NOM** and his brother.**MSG.NOM**
           Intended: 'My neighbor and his brother were standing on the stairway landing.'   *unergative*

         b.   Na stole stojal   stakan   i   kuvšin.
           on table stood.**MSG** glass.**MSG.NOM** and jug.**MSG.NOM**
           'On the table stood a glass and a jug.'   *unaccusative*

                                                       (Krejci, 2020:126f.)

- Example 3: Case marking in Tsova Tush
  - Unergatives surface with ergative, unaccusatives with nominative case
  - Changing the degree of agentivity of the argument more broadly allows the verb to switch behavior

(3)   a.   (as)   vuiž-n-as.
           1SG.**ERG** fell-AOR.1SG-**ERG**
           'I fell down, on purpose.'   *unergative*

b.   so   vož-en-sO.
     1SG.**NOM** fell-AOR.1SG-**NOM**
     'I fell down, by accident.'   *unaccusative*
                                   (Holisky, 1987:105)

Overall, two semantic factors have been argued to affect the behavior of variable intransitives:

- Telicity: An event that has a natural endpoint is more likely to be expressed with an unaccusative structure;
- Agentivity: A strongly agentive (purposeful, volitional, causally efficacious, animate...) construal of the argument favours an unergative construal.

1.2.   Variable unaccusativity vs. the causative-inchoative alternation

Variable unaccusativity contrasts with more canonical argument-structural alternations such as the causative-inchoative alternation (4):

(4)   a.   The glass broke.
      b.   Ahmad broke the glass.

Both syntactically (5) and semantically (6), the intransitive is a proper subset of the transitive (most clearly under the Voice alternation analysis in Alexiadou et al. (2015)).[1]

(5)   a.

b.
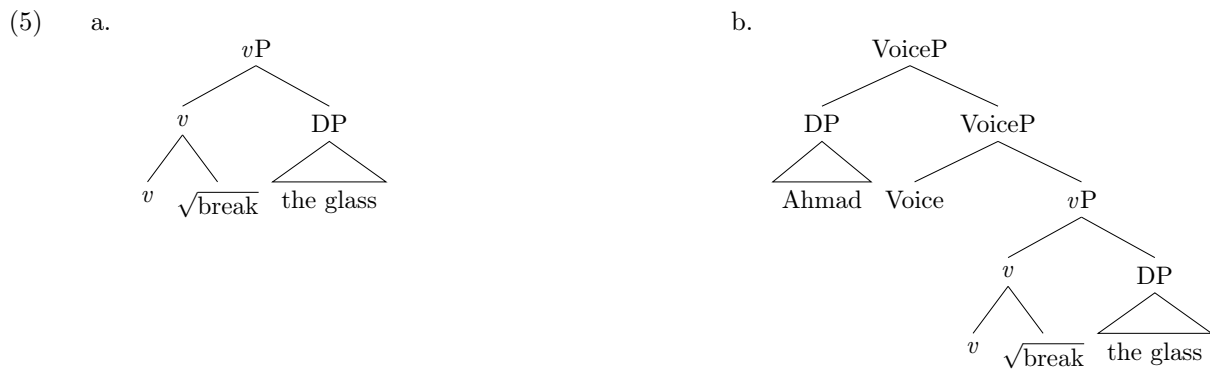
(6)   a.   λe. break(e) ∧ patient(e)(the glass)
      b.   λe. break(e) ∧ patient(e)(the glass) ∧ agent(e)(Ahmad)

In variable unaccusativity, neither variant is a subset of the other. Let's use the Tsova-Tush example (3):

(7)   a.

b.

---
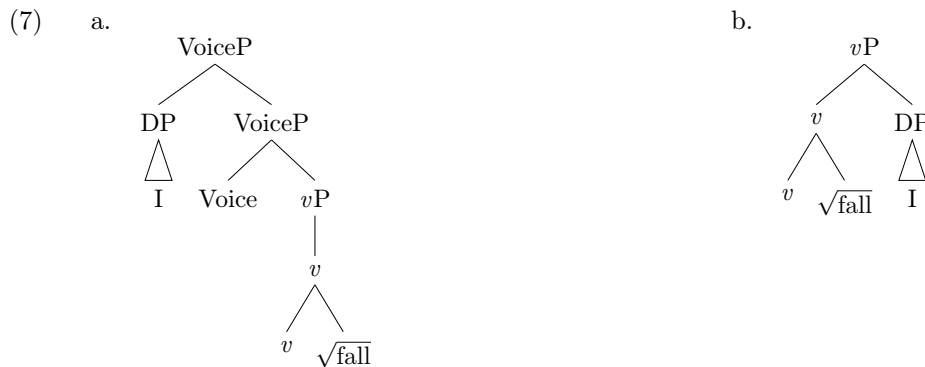
[1]This is not to say that the syntactic subset is necessarily a constituent; see, e.g., the transitive/transitive-cum-high-applicative alternation under the analysis in Pylkkänen (2008).

(8) a. λe. fall(e) ∧ agent(e)(speaker)
     b. λe. fall(e) ∧ patient(e)(speaker)

The question is, of course, what this contrast means and whether it matters. The case I will make today is as follows:

PREVIEW: THE KEY POINTS

- Variable unaccusativity is only one instance of a broader class of argument-structural alternations that have the same non-monotonic profile. I call this class *variable linking*.

- The existence of variable linking matters methodologically and also raises big questions about θ-roles and the licensing of arguments.

---

2. DEFINING VARIABLE LINKING

In this section, I will...
- Define variable linking by splitting up θ-roles into individual roles and linguistic roles;
- Outline our basic architecture for today.

2.1. Individual roles and linguistic roles

Instead of using a traditional notion of θ-roles, I adopt the distinction drawn in Dowty (1989) between *individual roles* and *linguistic roles*.

- Individual roles (ι-roles)
  - Concrete, tied to specific verbs
  - Examples: runner, kicker, kissee, ...
- Linguistic roles (λ-roles)
  - Abstract, not tied to specific verbs or events
  - Examples: agent, patient, goal...

Let's practice with a simple example:

(9) Sepideh kissed Amir.

(10)

	Individual role	Linguistic role
Sepideh	Kisser	Agent
Amir	Kissee	Patient

Note that individual roles, as I will use the term, are determined exclusively by the verb. I believe that we have intuitions about such roles that guide our analyses and that are hence worth examining. I do not believe that individual roles will ultimately turn out to be a particularly useful component of a theory of argument structure.

Dowty seemed to assume that individual roles always map straightforwardly onto linguistic roles:

> ... If Helen carries the rock from John to the porch, then no matter whether one in some way 'views' that kind of event from the point of view of Helen, the rock, John, or the porch, or whether one passivizes the sentence or otherwise alters it syntactically (by topicalizing an NP, etc.), or substitutes a synonym of carry, or puts it in a different discourse context, Helen still remains the Agent, the rock remains the Patient (Theme), John remains the Source, and the porch remains the Goal. That is, any truth-conditionally equivalent sentence has the same role assignments. The nature of the carrying event itself, it seems, fixes these roles. (Dowty, 1991:563)
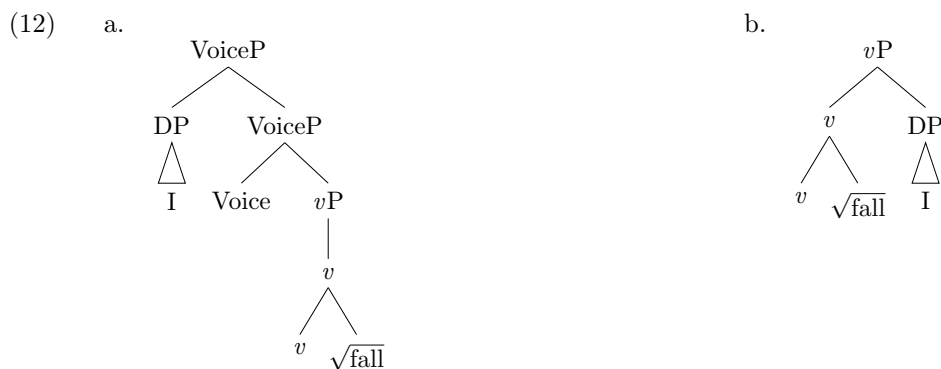
We can now define variable linking as those alternations for which Dowty – or at least a simple-minded interpretation of what Dowty says – is wrong.

DEFINITION: VARIABLE LINKING

Variable linking alternations are a class of argument-structural alternations in which an individual role is mapped onto different linguistic roles in the different alternants.

Let's check this definition against the Tsova-Tush example in (3), repeated below as (11):

(11)   a.   (as)   vuiž-n-as.
           1SG.**ERG** fell-AOR.1SG-**ERG**
           'I fell down, on purpose.'

                             b.   so   vož-en-sO.
                                   1SG.**NOM** fell-AOR.1SG-**NOM**
                                   'I fell down, by accident.'

                                                           (Holisky, 1987:105)

(12)   a.   b.

(Syntax tree a: VoiceP branching into DP [I] and VoiceP, which branches into Voice and vP, which dominates v, which branches into v and √fall.)

(Syntax tree b: vP branching into v and DP [I], where v branches into v and √fall.)

As summarized in in (13), a single individual role (a faller) is mapped onto different linguistic roles (agent and patient) in the two alternants.

	Agent	Patient	Goal
Unergative	$\iota\text{-role}_1$		
Unaccusative		$\iota\text{-role}_1$	

(13)

2.2. Some housekeeping

In the remainder of this talk, we will look at some other cases of variable linking. I will adopt the following very simple architecture for the sake of argument:

- Three linguistic roles, understood along the lines of Dowty's proto-roles: agent, patient, goal (see Rissman and Majid, 2019 for an overview over experimental and typological evidence for this particular inventory of roles)
  - I am open to the idea that patients are rather the elsewhere interpretation (e.g., Kratzer, 2002).

- Three argument positions: external, internal, applicative
  - I gloss over the distinction between high and low applicatives (Pylkkänen, 2008).

- An unambiguous bidirectional mapping between agents and external arguments, patients and internal arguments, and goals and applicative arguments

3. TOWARDS A TYPOLOGY OF VARIABLE LINKING

In this section, I will...

- Survey other (potential) cases of variable linking cross-linguistically:
    1. Direct causatives of unergatives
    2. Direct causatives of ingestives
    3. Agent/affectee alternations
    4. Stative passives

3.1. Direct causatives of unergatives

A more complex case of variable linking are direct causatives of unergatives, seen here for Hindi-Urdu (14) and Sason Arabic (15):

(14)   a.   Rohan   **naach** rahaa   hai.
               Rohan.M **dance** PROG.MSG be.PRS.3MSG
               'Rohan is dancing.'
       b.   Shama   Rohan-ko   **nach-aa**   rahii   hai.
               Shama.F Rohan-DOM **dance-CAUS** PROG.F be.PRS.3MSG
               'Shama is making Rohan dance/twirling him around (the dance floor).'

                                                         (Bhatt and Embick, 2017:124)

(15)   a.   i-**zak**.   b.   a-**zakkiy**-u.
             3M-**laugh**   1SG-**laugh.CAUS**-him
             'He laughs.'   'I make him laugh.'   (Akkuş, 2021:175)

The causatives qualify as monoeventive based on evidence from adverbial modification. Compared to the subject of the intransitive, the object of the transitive is interpreted with reduced agentivity. In addition, only the latter passes internal argument diagnostics such as reduced relatives (16) and resultatives (17):

(16)   a.   ***dauṛ**-aa   laṛkaa
             run-PFV.MSG boy
             Intended: 'the run boy'
       b.   [Ravi-dwaaraa **dauṛ-aa**-yaa   gayaa]   laṛkaa
             Ravi-by   **run-CAUS**-PFV PASS.PFV boy
             'the boy run by Ravi' (i.e., the boy chased by Ravi)   (Bhatt and Embick, 2017:124f.)

(17)   a.   #sabi **faqaz** raxu.
             boy **ran**   sick
             Intended: 'The boy ran himself sick, became sick as the result of running.'
       b.   **faqqız**-tu-a   raxu-e, yani   cımd-e   barra.
             ran.CAUS-1SG-her sick-F   that.is got.cold-3F outside
             'I ran her sick, that is, she got a cold outside.'

Accordingly, I have proposed that direct causatives of unergatives in Hindi-Urdu, Turkish and Sason Arabic are regular transitives (18) (Neu, accepted; see also Harris, 1981 for Georgian and Legate, 2014 for Acehnese).

(18)   a.

b.
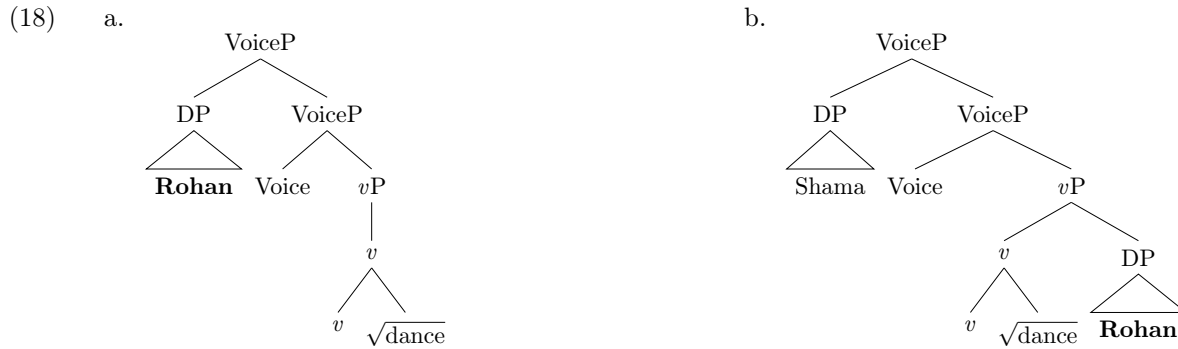
Similar to what we saw for variable unaccusativity, a single individual role is thus mapped to the agent role in one variant and the patient role in the other (19):

	Agent	Patient	Goal
(19) Unergative	ι-**role**$_1$		
Transitive	ι-role$_2$	ι-**role**$_1$	

There are plenty of competing analyses of causatives of unergatives that are set up so as to avoid variable linking, ensuring that the same individual role is realized with the same linguistic role and in the same syntactic position across alternants (Kouneli, 2021; Massam, 2009; Myler, 2022; Nie, 2020; Ramchand, 2008; Tollan, 2018; Tollan and Massam, 2022; Tollan and Oxford, 2018). I do not think this is warranted.

Note, however, that direct causatives of unergatives are a more complex case of variable linking than variable unaccusativity:

- Variable unaccusativity: a single individual role is mapped onto different linguistic roles
- Direct causatives of unergatives: a single individual role is mapped onto different linguistic roles *and* a single linguistic role is mapped onto different individual roles

3.2. Direct causatives of ingestives

It is a robust cross-linguistic generalization that transitives cannot form direct causatives, with the exception of one group of verbs commonly termed ingestives or ingesto-reflexives (for a typological overview, see Krejci, 2020). Examples are given for Hindi-Urdu in (20) and Sason Arabic in (21).

(20)   a.   Mina-ne   angrezii   **siikh**-ii
          Mina-ERG English.F **learn**-PFV.F
          'Mina learned English.'
     b.   Tina-ne   **Mina-ko**   angrezii   **sikh-aa**-yii.
          Tina-ERG **Mina-DAT** English.F **learn-CAUS**-PFV.F
          'Tina taught Mina English.' (lit. 'Tina learned Mina.DAT English.')

                                                       (Bhatt and Embick 2017:128)

(21)   a.   **şarab-**e mayn.
          drank-F water
          'She drank water.'
     b.   **şarrıp**-to-**lla**   mayn.
          drank.CAUS-1SG-**her.DAT** water
          'I gave her water to drink.' (lit. 'I drank her.DAT water.')

The resulting causatives can be shown to have a ditransitive structure, with the causee being realized as an indirect object (see also, again, Harris, 1981; Legate, 2014). In Hindi, the causee is obligatorily marked with -*ko*, as are indirect objects. While -*ko* can also serve as DOM marking on direct objects, in causatives

of ingestives *-ko* is obligatory and survives under passivization (22), unlike DOM (23) and like in regular ditransitives.

(22)   a.   *Tina-ne **Mina** angrezii **sikh-aa**-yii.
          Tina-ERG **Mina** English.F **learn-CAUS**-PFV.F
          'Tina taught Mina English.' (lit. 'Tina learned Mina.DAT English.')

        b.   **Mina-*(ko)** angrezii sikh-aa-yii   gayii
          Mina-DAT   English.F learn-CAUS-PFV.F PASS-PFV.F
          'English was taught to Mina.'   (Bhatt and Embick, 2017:129)

(23)   a.   Tina **haar(-ko)**   uṭh-aa   rahii   hai
          Tina.F **necklace-DOM** raise-CAUS PROG.F be.PRS
          'Tina is lifting a/the necklace.'

        b.   **haar**   uṭh-aa-yaa   gayaa
          necklace.M raise-caus-pfv.msg PASS.PFV.MSG
          'The necklace was lifted.'   (Bhatt and Embick, 2017:128)

In Sason Arabic, both regular indirect objects and causees of indirect causatives receive dative case marking. However, only the latter can be modified by depictives (Akkuş, 2021, see also Pylkkänen, 2008). The causee of causativized ingestives patterns with indirect objects for the purposes of this diagnostic, not allowing for depictives (24) .

(24)   şarrıp-to-lla   mayn **raxu-(*e)**.
        drank.CAUS-1SG-her.DAT water **sick-F**
        'I$_1$ gave her$_2$ water to drink sick$_{1/*2}$.' (lit. 'I drank her.DAT water sick.')

All of this indicates that while the subject of the transitive is an agent in SpecVoiceP, the causee of the ditransitive is a goal in SpecApplP (25):

(25)   a.   b.

	Agent	Patient	Goal
(26) Transitive	**ι-role$_1$**	ι-role$_2$	
Ditransitive	ι-role$_3$	ι-role$_2$	**ι-role$_1$**

3.3.   Agent/affectee alternations
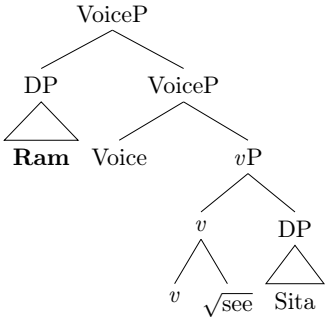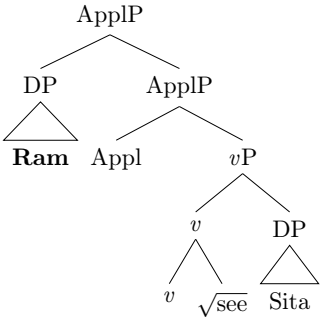
Agent/affectee alternations such as (27) are similar to causatives of ingestives but not valency-changing.

(27)   a.   **Ram-ne** Sita-ko   dekh-aa.
            Ram-ERG Sita-DOM see-PFV
            'Ram saw Sita.'
    b.   **Ram-ko**   Sita dikh-ii.
            Ram-DAT Sita see-PFV.F
            'Ram saw Sita.' (lit. Sita appeared to Ram)   (Bhatt and Embick, 2017:130f.)

Judging from case marking and agreement, *Ram* in (27b) is not an external argument but, pursuing the analogy to the causative cases seen earlier, an applicative argument. Further evidence comes from the fact that the object cannot bear DOM marking (28) and that (27b) cannot be passivized while (27a) can (29).

(28)   *Ram-ko Sita-**ko**   dikh-ii.
        Ram-DAT Sita-**DOM** see-PFV.F
        Intended: 'Ram saw Sita.' (lit. Sita appeared to Ram)

(29)   a.   Sita-ko   (Ram-dwaaraa) dekh-aa gaya
            Sita-DOM Ram-by   see-PFV go.PFV
            'Sita was seen by Ram.'
    b.   *Sita (Ram-dwaaraa) dikh-ii   gayii
            Sita Ram-by   see-PFV.F go.PFV.F
            Intended: 'Sita was seen by Ram.'

I conclude that as in direct causatives of ingestives, the same individual role is realized as an agent in one alternant and as a goal in another (30):

(30)   a.   b.

	Agent	Patient	Goal
(31) Transitive	**ɩ-role₁**	ɩ-role₂	
Applicative		ɩ-role₂	**ɩ-role₁**

Similar patterns have been attested in other languages (see Chen, 2024 for an overview) but the data require further scrutiny.

3.4.   *Stative passives*

The argument surfacing in stative passives is usually an internal argument (32):

(32)   a.   The door is opened. (= The door is in the state of having been opened)
    b.   *Elly is opened. (= Elly is in the state of having opened something)

However, Greek stative passives, besides the regular pattern (33a), show a funky behavior with ingestive verbs (33b) (see also Haspelmath, 1994 on similar cases in Hindi-Urdu and Latin):

(33)   a.   I   zoni   ine   asfalis-men-i.
            the.NOM belt.NOM be.3SG secure-PTCP-F.NOM
            'The seat belt is fastened.'
   b.   I   Maria   ine   faɣo-men-i.
            the.NOM Mary.NOM be.3SG eat-PTCP-F.NOM
            'Mary is eaten.' / 'Mary has eaten.'   (Paparounas, 2024)

Paparounas' (2024) analysis of (33) rests on the assumption that Mary in (33b) is an agent. Against the background of variable linking, this assumption is not necessarily warranted. Interestingly, Paparounas notes that (33b) is only licensed if the eating event has been completed, which could be taken to suggest a patient construal.

4.   CONCLUSION: WHY VARIABLE LINKING MATTERS

I argue that the key import of variable linking is threefold:

1. Methodologically, in the analysis of any alternation, it cannot be taken for granted that the same individual role is realized with the same linguistic role and/or in the same syntactic position across alternants.

2. Linguistic roles are the better θ-roles. They might also give us a much simplified picture of the syntax-semantics interface.

3. The linguistic role and the syntactic position of an argument (or individual role) are not exclusively determined by the verbal root but by the sentence as a whole.

The last point, when framed in this way, is trivial. However, it raises big questions – empirical and theoretical ones – that go beyond this talk.

REFERENCES

Akkuş, F. (2021). *(Implicit) argument introduction, Voice and causatives* [Doctoral dissertation]. University of Pennsylvania.

Alexiadou, A., Anagnostopoulou, E., & Schäfer, F. (2015). *External arguments in transitivity alternations: A layering approach.* Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199571949.001.0001

Bhatt, R., & Embick, D. (2017). Causative derivations in Hindi-Urdu. *Indian Linguistics*, *78*(1–2), 93–151.

Borer, H. (2005). *Structuring sense vol. ii: The normal course of events.* Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199263929.001.0001

Chen, M. (2024). A decomposition analysis of agents. *Glossa: a journal of general linguistics*, *9.* https://doi.org/10.16995/glossa.10624

Dowty, D. (1989). On the semantic content of the notion of 'thematic role'. In G. Chierchia, B. H. Partee, & R. Turner (Eds.), *Properties, types and meaning* (pp. 69–130). Kluwer.

Dowty, D. (1991). Thematic proto-roles and argument selection. *Language*, *67*, 547–619. https://doi.org/10.2307/415037

Harris, A. (1981). *Georgian syntax.* Cambridge University Press.

Haspelmath, M. (1994). Passive participles across languages. In P. J. Hopper (Ed.), *Voice: Form and function* (pp. 151–177). John Benjamins Publishing Company. https://doi.org/10.1075/tsl.27.08has

Holisky, D. A. (1987). The case of the intransitive subject in Tsova-Tush (Batsbi). *Lingua*, *71*, 102–132. https://doi.org/10.1016/0024-3841(87)90069-6

Kouneli, M. (2021). *High vs. Low external arguments: Evidence from Kipsigis* [Handout from talk given at SAIAL, Potsdam].

Kratzer, A. (2002). *The event argument* [Ms., UMass Amherst].

Krejci, B. (2020). *Syntactic and semantic perspectives on first conjunct agreement in Russian* [Doctoral dissertation]. Stanford University.

Legate, J. A. (2014). *Voice and v: Lessons from Acehnese*. MIT Press. https://doi.org/10.7551/mitpress/9780262028141.001.0001

Massam, D. (2009). The structure of (un)ergatives. In S. Chung, D. Finer, I. Paul, & E. Potsdam (Eds.), *Proceedings of the 16th Meeting of the Austronesian Formal Linguistics Association* (pp. 125–135).

Myler, N. (2022). *Argument structure and morphology in Cochabamba Quechua (with occasional comparison with other Quechua varieties)* [Ms., Boston University].

Neu, E. (Accepted). *Direct causatives of unergatives: A view from variable unaccusativity* [Accepted with minor revisions at NLLT].

Nie, Y. (2020). *Licensing arguments* [Doctoral dissertation]. New York University.

Paparounas, L. (2024). Greek stative passives are not passives: Evidence from thematic reversal [Handout from talk given at NELS, Yale University].

Perlmutter, D., & Postal, P. (1984). The 1-Advancement Exclusiveness Law. In D. Perlmutter & C. Rosen (Eds.), *Studies in Relational Grammar* (pp. 81–125). University of Chicago Press.

Pylkkänen, L. (2008). *Introducing arguments*. MIT Press. https://doi.org/10.7551/mitpress/9780262162548.001.0001

Ramchand, G. C. (2008). *Verb meaning and the lexicon*. Cambridge UP. https://doi.org/10.1017/cbo9780511486319

Rissman, L., & Majid, A. (2019). Thematic roles: Core knowledge or linguistic construct? *Psychonomic Bulletin amp; Review*, *26*, 1850–1869. https://doi.org/10.3758/s13423-019-01634-5

Sorace, A. (2000). Gradients in auxiliary selection with intransitive verbs. *Language*, *76*(4), 859–890. https://doi.org/10.2307/417202

Sorace, A. (2004). Gradience at the lexicon-syntax interface: Evidence from auxiliary selection and implications for unaccusativity. In A. Alexiadou, E. Anagnostopoulou, & M. Everaert (Eds.), *The unaccusativity puzzle* (pp. 243–268). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199257652.003.0010

Sorace, A. (2011). Gradience in split intransitivity: The end of the Unaccusative Hypothesis? *Archivio Glottologico Italiano*, *96*(1), 67–86.

Tollan, R. (2018). Unergatives are different: Two types of transitivity in Samoan. *Glossa: a journal of general linguistics*, *35*, 1–41. https://doi.org/10.5334/gjgl.223

Tollan, R., & Massam, D. (2022). Licensing unergative objects in ergative languages: The view from Polynesian. *Syntax*, *25*(3), 242–275. https://doi.org/10.1111/synt.12232

Tollan, R., & Oxford, W. (2018). Voice-less unergatives: Evidence from Algonquian. In W. G. Bennett, L. Hracs, & D. R. Storoshenko (Eds.), *Proceedings of the 35th West Coast Conference on Formal Linguistics* (pp. 399–408). Cascadilla Proceedings Project.

Appendix: Entailments with variable linking alternations

A strange fact about direct causatives of unergatives is that they appear to entail the intransitive (34):[2]

(34)   a.   Sepideh danced Amir around the room.
        b.   Amir danced.

How would this entailment look like using traditional θ-role notation?

(35)   a. $\lambda e.$ dance(e) $\wedge$ **patient(e)(Amir)** $\wedge$ agent(e)(Sepideh) $\wedge$ around-the-room(e)
        b. $\lambda e.$ dance(e) $\wedge$ **agent(e)(Amir)**

This is clearly invalid. Let's use individual roles instead:

(36)   a. $\lambda e.$ dance(e) $\wedge$ **feet-mover(e)(Amir)** $\wedge$ push-arounder(e)(Sepideh) $\wedge$ around-the-room(e)

---

[2]I have trepidations about English causatives of unergatives because they have odd properties that I don't fully understand. I'm using English examples nonetheless to allow us all to access our intuitions. The entailment facts are the same in, e.g., Hindi.

      b. λe. dance(e) $\wedge$ **feet-mover(e)(Amir)**

This works. What happens when we now add linguistic roles?

(37)   a. λe. dance(e) $\wedge$ feet-mover(e)(Amir) $\wedge$ **patient(e)(Amir)** $\wedge$ push-arounder(e)(Sepideh) $\wedge$ **agent(e) (Sepideh)** $\wedge$ around-the-room(e)

          b. λe. dance(e) $\wedge$ feet-mover(e)(Amir) $\wedge$ **agent(e)(Amir)**

The entailment in (37) is not valid but this might actually be correct. The sentence *Sepideh danced Amir around the room* does not entail that Amir acts in an abstractly agentive fashion but merely that he moves his feet, and the intransitive can arguably feel somewhat infelicitous in situations in which the transitive could apply, or vice versa. It would be worth clarifying empirically what intuitions speakers have about such cases.

So far, all of this suggests that both linguistic roles and individual roles need to form part of the denotation of the sentence. How concretely individual roles should be represented is not fully clear, at least to me.