

THETA-ROLES, INDIVIDUAL ROLES AND THE NATURE OF ROOTS

NYU Syntax Brown Bag

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This is a talk about the interface between syntax and lexical semantics, focusing on argument structure, and even more specifically, on θ -roles. Syntax and lexical semantics are commonly conceptualized as two wholly distinct modules of the grammar. The architectural question this raises is how they communicate with each other. Here, I will be concerned with θ -roles as a construct that mediates between these two realms.

A heads up that the data we will look at are uncomfortably lexical and hard to even describe properly in a syntactic theory. I believe this tells us that we have an interesting problem on our hands.

ROADMAP

1. Data

I present a series of case studies in which θ -role assignment violates our expectations. I try to make explicit what those expectations are.

2. Theory

For two theories of argument structure – Cognitive Construction Grammar and DM –, I discuss whether they are compatible with the data from Section 1. Cognitive Construction Grammar seems to predict these data to be impossible. DM doesn't seem to make any predictions in this area, which I argue is a problem.

3. Speculation

I sketch out a way out of the problem. My strategy consists in thinking a bit differently about lexical meaning and the nature of compositionality in the verbal domain.

1. DATA

In the following, I present four out of six case studies I work on that exemplify a phenomenon I label variable linking. My goal here is not to present a comprehensive analysis of the constructions in question, but focus on what they can tell us about θ -roles.

1.1. Variable unaccusativity

Intransitives are commonly assumed to fall into two groups: unergatives with an external argument assigned an agent θ -role, and unaccusatives with an internal argument assigned a patient θ -role. Note that I use the terms ‘agent’ and ‘patient’ in the broad prototype-sense of Dowty (1991).

It has long been observed that many intransitives sometimes pass as unergatives and sometimes as unaccusatives according to the same diagnostic (Borer, 2005b; Levin and Rappaport Hovav, 1995; Perlmutter and Postal, 1984; Sorace, 2000, a.m.o.). This is shown in (1) for reduced relatives in Hindi-Urdu.

- (1) a. *ur-ii (huu-ii) ciryaa
 fly-PFV.FSG be-PFV.FSG bird.FSG
 Intended: ‘the flown bird’
- b. ur-ii (huu-ii) patang
 fly-PFV.FSG be-PFV.FSG kite.FSG
 ‘the flown kite’ (Ahmed, 2010:8f.)

This switch between unergative and unaccusative behavior is not random. Example (1a) features an animate argument; the flying in this case is an active, effortful activity. In (1b), on the other hand, the argument is inanimate, and the flying is best described as a passive floating. Accordingly, we find a difference in θ -roles. A similar effect, although not tied to animacy proper, can be seen in (2) for case marking in Tsova-Tush:

- (2) 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)

(Holisky, 1987:105)

Moreover, the choice between unergative and unaccusative behavior can depend on the telicity of the verb phrase, seen in (3) for auxiliary selection in Dutch:

- (3) a. De bal heeft/*is gerold.
 the ball has/is rolled
 ‘The ball rolled.’

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

(Sorace, 2000:876)

Undergoing a change of state is a property associated with patients, and it obtains in (3b), but not in (3a).

In short, the syntactic diagnostics indicating a contrast between external and internal arguments align with a contrast between agent- and patient-like semantic properties. This indicates that we are indeed dealing with two different θ -roles in the (a) and (b) examples.

At the same time, we have the intuition that the argument in the two alternants is in some sense the ‘same’ argument: a flyer, a faller and a roller. Let us make this intuition precise.

DEFINITIONS: θ -ROLES AND INDIVIDUAL ROLES

Following Dowty (1991), I understand θ -roles as prototypes that are defined in terms of abstract thematic entailments:

- Agent: volition, sentience, causal power...
 - Patient: undergoing a change of state, being causally affected...

I use the term individual roles to describe entailments associated with an argument that are not thematic but verb-specific:

- Flyer: moving through the air, ...
 - Faller: moving downwards, ...

I cannot emphasize enough that individual roles are a concept I use for purely heuristic purposes as a handy way to refer to verb-specific entailments. I do not think that they have a proper grammatical status. Later in this talk, we will spend a considerable amount of time taking them apart.

Usually, the individual roles and θ -roles of a verb stand in a one-to-one mapping relation (4):

- (4) Brutus stabbed Caesar.

What is curious about variable unaccusativity, then, is that a single individual role is mapped onto two different θ -roles (agent and patient) in the two alternants. I label this phenomenon variable linking.

DEFINITION: VARIABLE LINKING

Variable linking is an alternation in which the individual roles and the θ-roles of a given verb do not stand in a one-to-one mapping relationship.

I will now walk us through three further examples of variable linking.

1.2. Direct causatives of unergatives

In many languages, verbs that in their intransitive form pass unergativity diagnostics can also occur as direct causatives (Bhatt and Embick, 2017; Harris, 1981; Kouneli, 2021; Krishnan and Sarma, 2023; Legate, 2014; Massam, 2009; Megerdoomian, 2002; Myler, 2022; Nash, 2021; Nie, 2020; Tollar, 2018; Tollar and Massam, 2022; Tollar and Oxford, 2018). The alternation is seen for Hindi-Urdu in (5), Turkish in (6) and Sason Arabic in (7):

- (5) 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)

- (6) a. Bebek uyu-du.
 baby sleep-PST
 ‘The baby slept.’
 b. (Ben) bebeg-i uyu-t-tu-m.
 I baby-ACC sleep-CAUS-PST-1SG
 ‘I put the baby to sleep.’

- (7) a. i-zak.
 3M-laugh
 ‘He laughs.’
 b. a-zakkiy-u.
 1SG-laugh.CAUS-him
 ‘I make him laugh.’

(Akkuş, 2021:175)

The object of the transitive but not the subject of the intransitive passes internal argument diagnostics such as reduced relatives (8) or resultatives (9):

- (8) a. *daur-aa larkaa
 run-PFV.MSG boy
 Intended: ‘the run boy’
 b. [Ravi-dwaaraa daur-aa-yaa gayaa] larkaa
 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.)
- (9) a. #sabi faqaz raxu.
 boy ran sick
 Intended: ‘The boy ran himself sick, became sick as the result of running.’
 b. faqqiz-tu-a raxu-e, yani cimd-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.’

Along with Harris (1981) for Georgian, Legate (2014) for Acehnese and Nie (2020) for Tagalog, I have thus proposed in Neu (To appear) that direct causatives of unergatives in Hindi-Urdu, Turkish and Sason Arabic are regular transitives in which the object argument is realized as an internal argument. Moreover, I have

argued that the argument is assigned a patient θ-role: it is less agentive than the external causer argument, and it is instead associated with the patient property of being causally affected (see also Levin and Rappaport Hovav, 1995).

Similar to what we saw for variable unaccusativity, a single individual role – a dancer, sleeper, laugher, etc. – is thus mapped onto the agent position in the intransitive and the patient position in the transitive. In addition, a single θ-role is mapped onto different individual roles – e.g., a dancer and a making-dancer – in the two alternants.

1.3. Direct causatives of ingestives

While transitives typically cannot form direct causatives cross-linguistically, a group of verbs commonly termed ingestives or ingestio-reflexives often can (Aikhenvald, 2000; Amberber, 2002; Bhatt and Embick, 2017; Dixon, 2000; Guerssel, 1986; Jerro, 2019; Legate, 2014; Masica, 1976; Mohanan, 1983; Rice, 2000; Shibatani and Pardeshi, 2002; Vázquez Soto, 2008; Zaheed, 2011; see Krejci, 2012 for an overview). Again, I exemplify the alternation with Sason Arabic in (10) and Hindi-Urdu in (11).

- (10) a. ayal-e Leyla badincan.
 eat-F Leyla tomatoes
 ‘Leyla ate tomatoes.’
 - b. ayyil-tu Leyla badincan.
 eat.CAUS-1SG Leyla tomatoes
 ‘I fed Leyla tomatoes.’ (lit. ‘I ate Leyla.DAT tomatoes.’)
- (11) a. Mina-ne angrezi siikh-ii
 Mina-ERG English.F learn-PFV.F
 ‘Mina learned English.’
 - b. Tina-ne Mina-ko angrezi 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)

The resulting causatives can be shown to have a ditransitive structure, with the external argument of the transitive now being realized as an indirect object in a low applicative position (Bhatt and Embick, 2017; Legate, 2014). For instance, in Sason Arabic, the embedded causee in indirect causatives can be modified by a depictive (12a) but the indirect object of a ditransitive cannot (12b) (Akkuş, 2021, see also Pylkkänen, 2008 for English):

- (12) a. nana xassal-na kemal potad sarxoş.
 we wash.CAUS-1PL kemal clothes drunk
 ‘We₁ made Kemal₂ wash the clothes drunk_{1/2}.’
- b. varr-e kemal xabar raxu-e/*raxu.
 showed-3F Kemal.M news sick-F/*sick.M
 ‘She₁ showed Kemal₂ the news sick_{1/2}.’

In direct causatives of ingestives, the dative-marked argument cannot be modified by a depictive (13):

- (13) şarrip-to-lla mayn raxu-(*)e.
 drank.CAUS-1SG-her.DAT water sick-F
 ‘I₁ gave her₂ water to drink sick_{1/2}.’ (lit. ‘I drank her.DAT water sick.’)
- (Akkuş, 2021:184)

I argue that in the ditransitive, the dative argument is assigned what I label very broadly a goal θ-role. As in direct causatives of unergatives, the argument now has fewer agent properties than the external causer, but it still has properties associated with goals in that it constitutes the endpoint of the path that the food takes.

Thus, the same individual role – e.g., an eater – is variably assigned either an agent or a goal θ-role. In addition, a single θ-role – the agent – is associated with two different individual roles, either an eater or a

making eater.

1.4. Agent-affectee alternations

In many Indo-European languages, inchoative verbs can surface with dative arguments that are interpreted either as being affected by the verbal event or as unintentionally causing it (Bosse, 2017; Cuervo, 2003; Frąckowiak and Rivero, 2008; Kallulli, 2008; Rivero, 2004; Schäfer, 2008; Suárez-Palma, 2020; Suárez-Palma and Santamaría-Gallego, 2024; see also Ganenkov et al., 2008; Rákosi, 2014). The second reading can also be expressed by a standard causative. The alternation is shown in (14) and (15) for German and Spanish, respectively.

- (14) a. Mir ist deine Vase zerbrochen.
me.DAT is your vase broken
'Your vase broke on me.'
'I (accidentally) broke your vase.'
- b. Ich habe deine Vase zerbrochen.
I have your vase broken
'I broke your vase.'
- (15) a. Al tintorero se le quemaron los pantalones de Carolina.
to.the dry-cleaner REFL CL.DAT burnt.PL the trousers of Carolina
'Carolina's trousers got burnt on the dry-cleaner.'
'The dry-cleaner (accidentally) burnt Carolina's trousers.'
- b. El tintorero quemó los pantalones de Carolina.
the dry-cleaner burnt.SG the trousers of Carolina
'The dry-cleaner burnt Carolina's trousers.'
- (Cuervo, 2003:186)

Both alternants thus involve the same individual role – in (14), a breaker – that is realized in different syntactic positions: the external argument position in the causative (14b), and an applicative position in the inchoative (14a)).

I further argue that the argument is assigned two different θ -roles: an agent role in the causative (14b) and an affectee role in the inchoative (14a). This affectee role underlies both readings in (14a) (contra Cuervo, 2003; Kallulli, 2008; Schäfer, 2008). The breaker role is thus mapped onto two different θ -roles in the two variants: an agent role in (14b) and an affectee role in (14a).

INTERIM SUMMARY

- We have seen multiple alternations where a single individual role – which I use here as a purely heuristic concept to describe verb-specific entailments – is mapped onto different θ -roles in the two alternants. In addition, a single θ -role could be associated with different individual roles.
- The question we need to tackle next is if this phenomenon is in fact predicted by theories of argument structure, and how these theories express verb-specific entailments in the first place.

2. THEORY

2.1. Cognitive Construction Grammar

Cognitive Construction Grammar (1995, 2006) occupies an intermediate point between purely lexicalist and purely syntactic theories of argument structure. Both the verb itself and the broader construction contribute meaning to the sentence: the denotation of a verb contains a set of individual roles, and the denotation of the construction contains a set of θ -roles.¹ For instance, the verb *hand* comes with three individual roles (16):

- (16) HAND < hander handee handed >

The ditransitive CAUSE-RECEIVE construction comes with an agent, a recipient and a patient θ -role (17):

¹Goldberg uses the terms *participant roles* and *argument roles*, but I believe that imposing our terminology on her is innocuous.

- (17) CAUSE-RECEIVE < agt rec pat >

For a sentence to be grammatical, the individual roles on the verb must then be fused with the θ -roles on the construction, in line with general categorization principles.

I'd like to highlight three problems:

- Variable linking between individual roles and θ -roles is not predicted.
- We can't always identify contentful individual roles (18)–(19):

- (18) a. throw a baseball
b. throw support behind a candidate
c. throw a boxing match
d. throw a party
e. throw a fit

- (19) a. kill a cockroach
b. kill a conversation
c. kill an evening watching TV
d. kill a bottle (i.e., empty it)
e. kill an audience (i.e., wow it)

(Marantz, 1984:49)

- How can we detect the individual roles on a verb? Goldberg proposes the 'No verbing occurred' test for this purpose (20). The idea is that if we can observe the meaning of a verb in a θ -role free environment, we can see its individual roles in their unadulterated form.

- (20) No kicking occurred.

(Goldberg, 1995:43f.)

Aside from the fact that it is not clear why (20) does not contain any θ -roles, I am skeptical that the intuitions we have about a verb in isolation are an accurate representation of the root as it enters the derivation. I suspect they rather reflect the most prototypical usage of this root.

2.2. DM

Where are individual roles and θ -roles in a DM architecture? Let us say (approximatively) that θ -roles are introduced by functional heads in the syntax. As for individual roles, we might tentatively locate them on the root.

We still need to constrain the mapping between individual roles and θ -roles/syntax to prevent (21) from meaning that Caesar stabbed Brutus. But it is not clear how architecturally, this mapping relation can be represented if lexical meaning takes the form of acategorical roots.

- (21) Brutus stabbed Caesar.

Moreover, if we put individual roles on the root, aren't we just reinventing Goldberg?

INTERIM SUMMARY

- The problem is not variable linking, but how to constrain the mapping between lexical semantics and θ -roles at all. Variable linking just alerts us to the fact that we don't have a theory of this mapping.
- In moving forward, I'd like us to take seriously the idea that our intuitions about the meaning of a verb in isolation might be misleading.
- Specifically, I want to introduce a way of thinking about verb meaning where individual roles are not always already located on the root.

3. SPECULATION

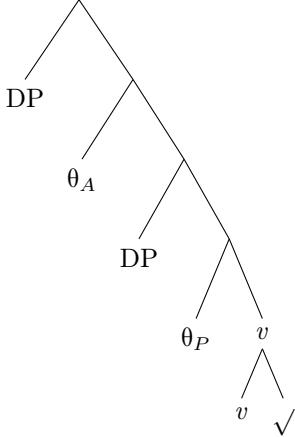
I'll argue that the problem we are looking at ultimately has to do with the representation of root meaning and the nature of compositionality in the verbal domain. By way of analogy, I'll draw on the observation that there are different 'degrees' of compositionality (22):

- (22) a. stab Caesar
 b. kill an afternoon
 c. kick the bucket
- (fully transparent)
 (semi-transparent)
 (opaque)

A way of thinking about (22b) that does not force us to call it an idiom is that the expression is, in a sense, perfectly compositional. It's just that *kill* does not mean (roughly) *cause to die*. Rather, it means whatever generates the meaning of *kill an afternoon* when it combines with *an afternoon*.

Let's get back to θ -roles and finally look at a tree (23) (see, e.g., Borer, 2005a, 2005b). I assume that the higher v is of type $\langle e, t \rangle$, and that θ -roles are of type $\langle \langle e, t \rangle, \langle e, \langle e, t \rangle \rangle \rangle$.

(23)



How transparent is the combination of an event description that is as of yet without arguments (e.g., for *stab*) and θ_P ? Let us walk through our three options.

1. *Fully transparent*. Both the meaning of the patient θ -role and the meaning of the argument-free event description would be recognizably present in the meaning of their mother node. However, the meaning of an argument-free event description is not recognizable in the first place.

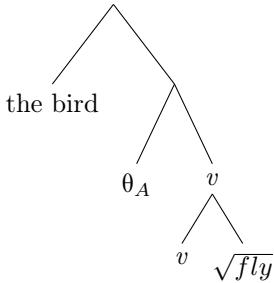
2. *Opaque*. The patient θ -role would be on the verb. The verb would never occur without introducing its internal argument (if it has one at all) and there would be no general patient θ -role outside the context of particular verbs. However, there would then be no reason to expect any thematic coherence between different internal arguments. More importantly, it is not clear how to deal with variable unaccusativity.

3. *Semi-transparent*. The meaning of *stab* is whatever generates the meaning of someone being penetrated by a sharp weapon when combining with a patient θ -role. Something like a 'stabbee' is not always already on the root, but created by combining (verbalized) roots with θ -roles.

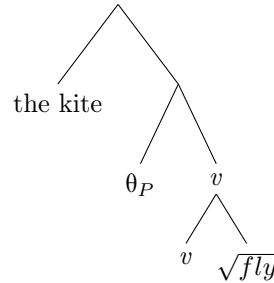
How does this help with cases of variable unaccusativity such as (24)?

- (24) a. *ur-ii (huu-ii) cirya
 fly-PFV.FSG be-PFV.FSG bird.FSG
 Intended: 'the flown bird'
- b. ur-ii (huu-ii) patang
 fly-PFV.FSG be-PFV.FSG kite.FSG
 'the flown kite' (Ahmed, 2010:8f.)

(25)



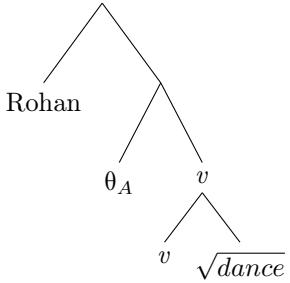
(26)



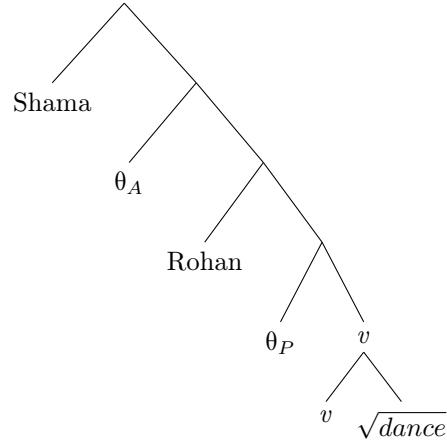
Fly means whatever generates the meaning of flying agentively when combining with an agent θ-role, and the meaning of flying in a patient-like manner with a patient θ-role. In this case, it is easy to identify a shared core ('moving through the air'). However, with cases such as *dance* (27), it is already less straightforward:

- (27) 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)

(28)



(29)



The fact that in direct causatives of unergatives and other constructions, the same θ-role corresponds to different individual roles is easily accounted for: an agent of a dancing event and an agent of a dancing-Rohan event are different (Marantz, 1984).

KEY POINTS

- I started this talk today with some data on θ-role assignment that I’ve described as variable linking. I hope to have convinced you that these data point towards some more general questions about the representation of lexical meaning.
- Variable linking is only unexpected if we assume, explicitly or implicitly, that verbs come with arguments and that θ-roles classify these arguments.
- I’ve argued that how the arguments of specific verbs are interpreted is not always already specified on the root, but the result of combining the root with functional structure (viz., θ-roles).
- This way of thinking about roots requires a notion of compositionality that operates on ‘meanings’ that we cannot mentally represent. But I suspect that by introducing acategorical roots into the derivation, we have already made this choice anyway.

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