Towards a root-sensitive approach to event structure

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1 Introduction

- In this talk, I explore the division of labor between grammar and the lexicon from the viewpoint of event structural theories which take verb meanings to decompose into event templates and roots (cf. Rappaport Hovav & Levin, 1998; Levin & Rappaport Hovav, 2005; Ramchand, 2008; Alexiadou et al., 2015; Beavers & Koontz-Garboden, 2020, *i.a.*).

- On this view, the standard assumption is that event templates are responsible for defining the temporal and causal structure of the event. Roots, in contrast, fill in real-world details about the event.

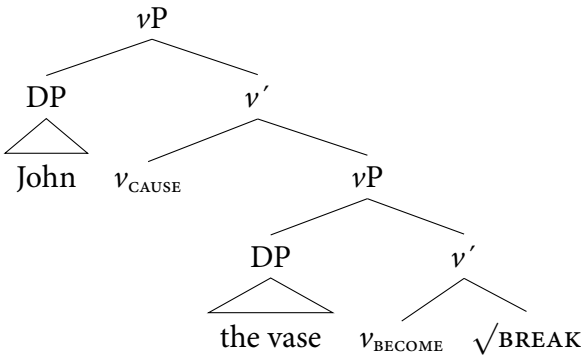
(1) a. John broke the vase.
b. [[John ACT] CAUSE [the vase BECOME <*BREAK*>]]

- In Rappaport Hovav & Levin's (1998) event structural approach as represented in (1), event structures are not represented in the syntax, but rather an event structure is taken to be part of the lexical entry of a verb (Beavers & Koontz-Garboden, 2020: 11).

- In contrast, syntactic decompositional theories of verb meaning take event structures to be represented in the syntax (Lakoff, 1965; McCawley, 1968, 1971; Ross, 1972; Hale & Keyser, 1993, 1997, 2002; Pesetsky, 1995; von Stechow, 1996; Marantz, 1997; Harley, 2003; Borer, 2003; Folli & Harley, 2005; Ramchand, 2008; Alexiadou et al., 2015; Acedo-Matellán, 2016).

- This approach is significantly represented by linguists working in the Distributed Morphology tradition (Halle & Marantz, 1993; Marantz, 1997; Embick, 2004; Harley, 2014) which holds that verbs are created in the syntax by merging roots with event templates, defined by functional heads in the verbal domain.

(2) John broke the vase.



- An important consequence of this view is that the semantics of the whole event structure and in turn the grammatical properties of the surface verbs, such as their morphology, aspectual properties or argument structure, are mostly determined by event templates. This is because only event templates are assumed to introduce structural components of meaning.
- More specifically, meanings such as entailments of change are solely introduced in the syntax, via functional heads (e.g., v_{BECOME}), and roots simply provide idiosyncratic information.
- As Beavers & Koontz-Garboden (2020: 26) note, a question that has not received much attention by theories of verb meaning assuming an event structural approach is whether there is a clean divide between the meanings that roots and event templates introduce (but see Dowty, 1979; Goldberg, 1995; Wechsler, 2005 and especially Beavers & Koontz-Garboden, 2017; Koontz-Garboden & Beavers, 2017; Beavers et al., 2017; Beavers & Koontz-Garboden, 2020; Ausensi, 2020; Ausensi et al., 2020, 2021b).
- In other words, this line of research has not looked into whether structural components of meanings such as causation or change are solely introduced structurally, or whether roots can in turn also introduce them.
- The general assumption is that since event templates are responsible for introducing structural components of meaning, roots then must introduce meanings which are not grammatically relevant or structural in nature.
- Such a strong division of labor is the default assumption especially in syntactic approaches to event structure that take templatic meanings to be introduced solely by functional heads in the syntax (Harley, 1995; Embick, 2004; Borer, 2005a,b, 2013; Folli & Harley, 2005; Pylkkänen, 2008; Ramchand, 2008; Alexiadou et al., 2015, *i.a.*).
- In particular, Embick (2009: 1) proposes the Bifurcation Thesis for Roots which explicitly argues that the meanings roots and event templates introduce are mutually exclusive (see also Arad, 2005: 79 for the same claim, as well as Borer, 2005b, 2013; Dunbar & Wellwood, 2016).

(3) The Bifurcation Thesis for Roots: If a component of meaning is introduced by a semantic rule that applies to elements in combination [= by functional heads, JA], then that component of meaning cannot be part of the meaning of a root.

- Theories of event structure assume then a clean divide between the types of meanings introduced by event templates and the ones by roots. This division of labor has been made explicit in the Bifurcation Thesis for Roots by Embick (2009) and in the Root Hypothesis by Arad (2005), yet it is also assumed (though implicitly) by all theories of event structure regardless of implementational choice since the default assumption is that only event templates determine the grammatical properties of the surface verbs as they introduce structural components of meaning.
- In this talk:
  - I argue against this strong division of labor between event templates and roots by showing that roots play a bigger role in grammar and meaning composition. I provide evidence in favor of an event structural theory of verb meaning in which the contributions of event templates and roots need not be mutually exclusive, but can complement each other in some cases with grammatical consequences.
  - I contend that root-specific entailments are grammatically relevant as they can have an impact on the syntactic structure and in turn on the grammatical properties of the surface verbs. The overall picture is that roots can impose restrictions on the syntactic structures they associate with and therefore that the semantics of the whole event structure can be fully determined by roots.
  - This argues in favor of an event structural approach to verb meaning that needs to be sensitive to the semantic contribution of distinct classes of roots. The central goal of this talk is thus to provide a more nuanced view of the types of semantic entailments roots can carry in contrast to event templates by analyzing their division of labor as assumed in standard event structural theories.
  - My central thesis is that the meanings roots and event templates introduce can complement each other with grammatical consequences, insofar as there are certain classes of roots that can introduce structural components of meaning, i.e., the meanings typically associated with event templates. This suggests that there are semantic components of the event structure that need not be represented in the syntactic structure, but can be encoded directly within the root.
- To make my case, I focus on two case studies:
  1. Entailments of intentionality and the introduction of the external argument.
  2. (If there's time) Directed motion entailments in unaccusative predicates.

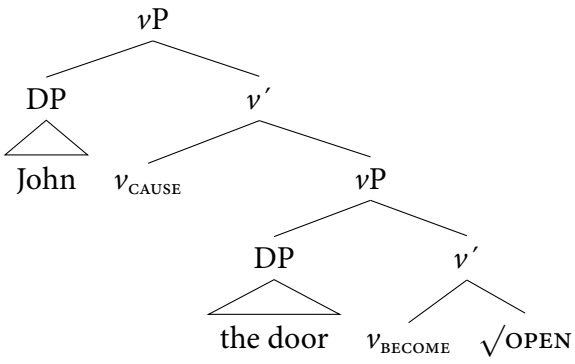
2 Background: Sublexical modification with modifiers like *again*

- An event structural approach to verb meaning neatly captures the fact that sublexical modification with *again* yields different readings depending on the height of its structural attachment site

in the event structure, as it has been discussed in detail in the literature on event decomposition (cf. Dowty, 1979; von Stechow, 1995, 1996, 2003; Beck & Snyder, 2001; Beck & Johnson, 2004; Bale, 2007; Beavers & Koontz-Garboden, 2020; Ausensi et al., 2020, 2021b,a).

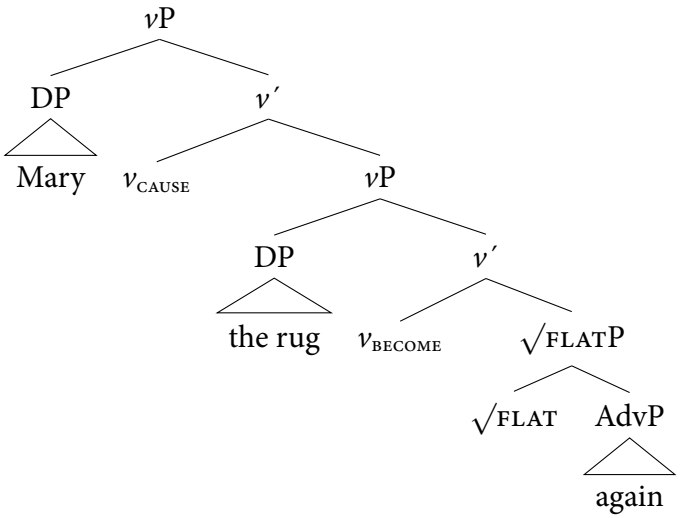
- Namely, in verbs with complex event structures such as in *John opened the door*, the modifier *again* generates multiple interpretations, i.e., the so-called restitutive and repetitive readings.
- The restitutive reading in the case of *John opened the door* relates to restoring the door to a previous state of openness that the door had before.
- When modified by *again*, such an example can be further ambiguous between (at least) two repetitive readings, namely that John is repeating his own previous event of causing the door to open and the one where John is causing the door to open, and it had opened before.
- Such an ambiguity can be accounted for if the event structure of causative uses of verbs such as *open* is the one as below, so that *again* can take scope over the root producing restitutive readings since the root denotes a simple uncaused state.

(4) John opened the door.

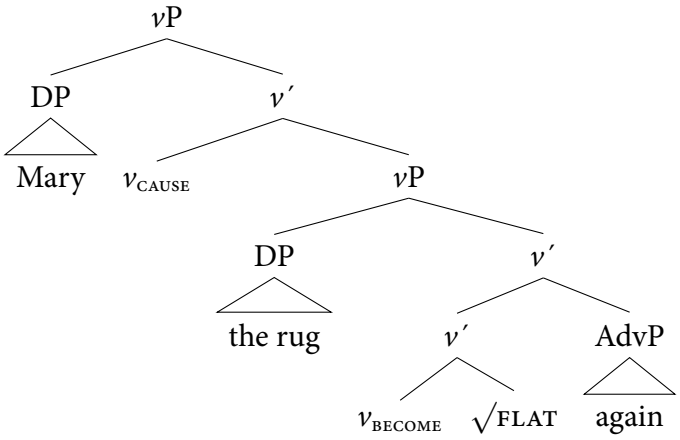


- *Again* can also take scope over the functional head v_{BECOME}, producing a repetitive reading that simply presupposes that the door had opened before and over the functional head v_{CAUSE}, which in this case presupposes that something or someone had caused the door to open before.
- The different presuppositions that *again* generates with causative change of state verbs like *open* or *flatten* can thus be said to follow from its structural attachment site. Compare this in the examples below (from Beavers & Koontz-Garboden, 2020: 17-8).

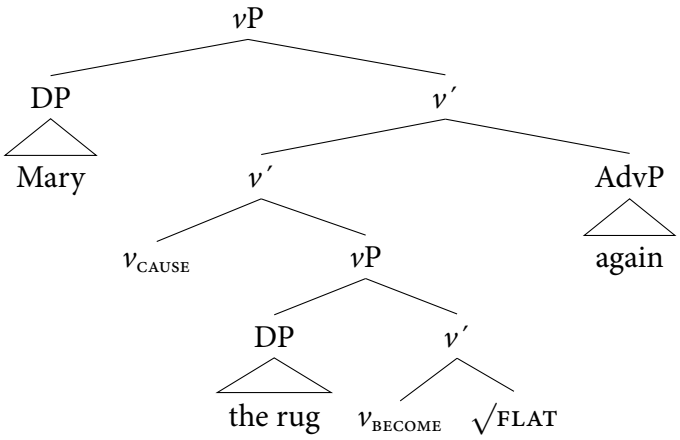
(5) Mary flattened the rug again, and it had been flat before. (Restitutive)



(6) Mary flattened the rug again, and it had flattened before. (Repetitive #1)



(7) Mary flattened the rug again, and she had flattened it before. (Repetitive #2)



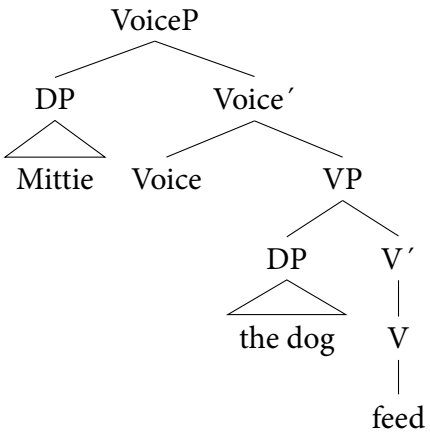
- Crucially, from such a theory of event structure it follows then that the root, e.g., $\sqrt{\text{FLAT}}$ in the present case, is an undecomposable scopal unit.
- In other words, on the lowest structural attachment site of *again*, namely when *again* has the truth-conditional content of the root in its scope, *again* generates a presupposition that a participant meets again the truth-conditional content of the root, i.e., the meaning related to the state the root names.
- Thus, in *John opened the door again*, when *again* has low scope means that *the door* meets (again) the truth conditions related to the state of *openness* (Beavers & Koontz-Garboden, 2020: 18).

3 Agent entailments and the introduction of the external argument

3.1 Voice and flavors of *v*

- In syntactic decompositional theories of verb meaning, it is a widespread assumption that external arguments are not arguments of the verbs themselves, but are introduced instead by functional heads in the syntax.
- Drawing on Marantz (1984), Kratzer (1996) influentially proposed that only internal arguments are true arguments of the verb itself since verbs only appear to impose semantic requirements on internal arguments. For instance, in order for *kill* to have the interpretation of 'spend time doing x' as in *kill an afternoon reading books* it selects an object that must denote time intervals.
- Regarding the formal implementation, Kratzer argues that external arguments are introduced by the functional head Voice in a neo-Davidsonian fashion, added by means of secondary predication in the specifier position of the Voice projection (Folli & Harley, 2005: 100). Objects, instead, are generated in the specifier position of the VP since they are assumed to be arguments of the verb.

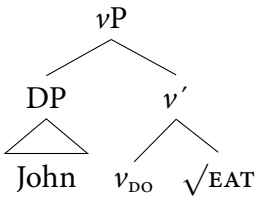
(8) Mittie fed the dog. (adapted from Alexiadou et al., 2015: 7)



- The locus of entailments of intentionality associated with the external argument is thus in the Voice head in the form of an Agent thematic role.

- Similarly, Folli & Harley (2005) influentially propose a flavors of *v* approach in the Distributed Morphology tradition (Halle & Marantz, 1993) in which the verbalizing little *v* head comes in two flavors, i.e., v_{DO} and v_{CAUSE} (see also Harley, 1995; Cuervo, 2003).[1]
- In this respect, Folli & Harley (2005) (see also Hale & Keyser, 1993, 2002; Folli & Harley, 2007, 2008; Pylkkänen, 2008) argue that meanings related to intentionality and/or agency are also introduced templatically, by the so-called functional head v_{DO}.
- More specifically, Folli & Harley argue that while v_{DO} requires the external argument to be an Agent, i.e., it introduces templatic meanings of agency/intentionality, v_{CAUSE}, on the other hand, places no restrictions on the external argument.

(9) John eats.



- However, under Folli & Harley's analysis and approaches that assume that external arguments are introduced by a separate layer in the syntax, it remains unclear why it is the case that verbs like *murder* only allow entities that must qualify as agents as their subject, in contrast to verbs like *kill* which appear to accept any type of entity as their subject.

(10)
a. #John murdered Tom by accident/unintentionally.
b. #The floods murdered the inhabitants of that town.
c. #Cancer murdered every patient in that hospital.
d. #The new machine weapon murdered all the enemies.

(11)
a. John killed Tom by accident/unintentionally.
b. The floods killed the inhabitants of that town.
c. Cancer killed every patient in that hospital.
d. The new machine weapon killed all the enemies.

- Whereas such approaches correctly capture the facts regarding verbs such as *kill*, namely that the external argument is truly external to the verb and therefore the verb cannot impose any semantic requirement on it, they fail to capture the facts regarding verbs like *murder*.

[1] Broadly speaking, approaches assuming that the external argument is introduced externally to the VP by a functional head in the syntax differ in assuming whether it is the Voice head (as in Kratzer, 1996; Alexiadou et al., 2006, 2015; Harley, 2017; Schäfer, 2017; Sundaresan & McFadden, 2017, *i.a.*) or instead the little *v* head (as in Chomsky, 1995; Embick, 2004; Folli & Harley, 2008; Harley, 2013; Merchant, 2013, *i.a.*) that actually introduce such an argument. For the present purposes, what is relevant is that the locus of agent entailments is uncontroversially assumed to be outside the root, i.e., in projections in the verbal domain such as $\text{Voice}_{\text{AGENT}}$ or v_{DO}, and therefore whether the external argument is actually introduced by one head or the other does not have any consequence for the present purposes, but see D'Alessandro et al. (2017) for a general overview of the two different approaches.

- Similarly, Alexiadou et al. (2015: 58) themselves also point out that "from the perspective of the Voice hypothesis, it is not immediately clear what forces the obligatory presence of the external argument" in verbal classes such as *murder* verbs, which always require the presence of the external argument, and are therefore never found in constructions which exclude it.

(12) a. *The president assassinated. (on intended reading)
b. *The citizens massacred.
c. *The mugger murdered.
d. The door broke/opened/closed.

- In the next section, I suggest that an explanation to such questions naturally follows if we acknowledge that well-defined classes of roots introduce templatic meanings of change or intentionality and consequently impose semantic restrictions on the event structure they associate with.

- In particular, I propose that $\sqrt{}$MURDER-type roots, i.e., $\sqrt{}$MURDER, $\sqrt{}$ASSASSINATE, $\sqrt{}$SLAUGHTER, $\sqrt{}$SLAY and $\sqrt{}$MASSACRE, have meanings assumed to be introduced by Voice$_{\text{AGENT}}$ or v_{DO} as part of their truth-conditional content.

3.2 Agent entailments in the semantics of roots

- I argue that entailments of intentionality associated with the external argument, i.e., a structural component of meaning that is uncontroversially assumed to be introduced by functional heads in the verbal domain, are part of the truth-conditional content of $\sqrt{}$MURDER-type roots.

- Crucial evidence comes from sublexical modification with *again* (cf. Dowty, 1979; von Stechow, 1995, 1996, 2003; Beck & Snyder, 2001; Beck & Johnson, 2004; Bale, 2007; Beavers & Koontz-Garboden, 2020; Ausensi et al., 2020, 2021b,a)

- In this vein, syntactic decompositional theories predict that if entailments of intentionality are introduced externally to the root by functional heads such as Voice$_{\text{AGENT}}$ or v_{DO}, in sentences such as *John murdered the monster again* we should expect that a presupposition where the intentionality associated with the external argument is not entailed is possible.

- In other words, when *again* attaches low, $\sqrt{}$MURDER-type roots should not entail intentionality associated with the external argument, since such a templatic notion is introduced higher up in the event structure by Voice$_{\text{AGENT}}$ or v_{DO}.

- I note that such a prediction is certainly borne out for roots of the $\sqrt{}$KILL sort because this class of roots does not introduce entailments of intentionality.

(13) $[\![\sqrt{\text{KILL}}]\!] = \lambda x \lambda s[\mathit{dead}'(x, s) \wedge \exists e' \exists v[\mathit{cause}'(v, e') \wedge \mathit{become}'(e', s)]]$

- Thus, *again* generates presuppositions that the event it modifies might not have been previously carried out intentionally, i.e., when it has low scope, since in this case *again* directly scopes over the truth-conditional content of the root.

(14) CONTEXT: A group of zombies have been killed by a toxic cloud. After they have come back to life, the citizens use a machine weapon and start shooting at them until they all die.
The citizens killed the zombies again.

- Similarly, $\sqrt{\text{KILL}}$ also allows contexts that explicitly state that the agent argument caused the death of some entity by accident in the previous event, but in the asserted event the killing is intentionally carried out by the same agent argument, as in (15).

(15) CONTEXT: A monster king has been killed accidentally by a brave knight. After the monster has been brought back to life by an evil wizard, the brave knight takes his sword and stabs him in the chest until it dies.
The brave knight killed the monster king again.

- Roots of the $\sqrt{\text{KILL}}$ sort thus allow repetitive presuppositions which exclude intentionality associated with the external argument. This is expected if such a class of roots does not have entailments of intentionality as part of their meaning.

- In contrast, $\sqrt{\text{MURDER}}$-type roots disallow this type of repetitive presuppositions, which strongly suggests that such a class of roots introduce entailments of intentionality independently of event templates.

- This is predicted since even when *again* has in its scope the truth-conditional content of $\sqrt{\text{MURDER}}$-type roots, such a class of roots will entail intentionality since intentionality is part of their meaning.

(16) $[\![\sqrt{\text{MURDER}}\text{-type}]\!] = \lambda x \lambda s[\mathit{dead}'(x, s) \wedge \exists e' \exists v[\mathit{cause}'(v, e') \wedge \mathit{become}'(e', s) \wedge \forall v'[\mathit{cause}'(v', e') \rightarrow \mathit{intentional}'(v')]]]$

- Thus, in contrast to roots of the $\sqrt{\text{KILL}}$ sort, $\sqrt{\text{MURDER}}$-type roots are not felicitous in scenarios that entail that the previous event of killing was unintentional or accidental.

(17) CONTEXT: A group of zombies have been killed by a toxic cloud. After they have come back to life, the citizens use a machine weapon and start shooting at them until they all die.
#The citizens massacred the zombies again.

- Further, $\sqrt{\text{MURDER}}$-type roots disallow repetitive presuppositions where the agent argument caused the death of the entity denoted by the object by accident in the prior event, but in the asserted event the killing is carried out intentionally by the same agent argument.

(18) CONTEXT: A monster king has been killed accidentally by a brave knight. After being brought back to life by an evil wizard, the brave knight takes his sword and stabs him in the chest until it dies.
#The brave knight assassinated the monster king again.

- It is crucial to note that $\sqrt{\text{MURDER}}$-type roots only allow repetitive presuppositions that entail that the previous event of killing is carried out intentionally, as illustrated in (19).

(19) a. CONTEXT: A monster king has been killed on purpose by a brave knight. After the monster king has been brought back to life by an evil wizard, the brave knight takes his sword and stabs him in the chest until it dies.
The brave knight assassinated the monster king again.

b. CONTEXT: A zombie has been killed intentionally by John. After the zombie has come back to life, John takes a gun and shots it in the head, and it immediately dies.
John murdered the zombie again.

- In sum, approaches that assume that entailments of change or intentionality are introduced templatically, and not by roots, make some interesting predictions about the architecture of event structure and the nature of root meaning.

- It has been shown, however, that some predictions turn out to be contrary to fact in some cases, as in the present case for $\sqrt{\text{MURDER}}$-type roots.

- Such approaches would predict that for $\sqrt{\text{MURDER}}$-type roots a presupposed previous event that excludes intentionality should be possible, yet this is never the case.

- In other words, if the semantics of the functional heads $\text{Voice}_{\text{AGENT}}$ and v_{DO} are severed from $\sqrt{\text{MURDER}}$-type roots, it is rather mysterious why the readings above in which the intentionality associated with the external argument is not included in *again*'s presuppositions are not possible.

- If we assume, on the other hand, that specific classes of roots have more complex meanings than previously thought and in turn introduce templatic notions such as change and intentionality, the mysterious data such as the one above can be then naturally accounted for.

3.3 Agents in the semantics of roots

- I further argue that $\sqrt{\text{MURDER}}$-type roots do not only entail intentionality associated with the external argument, but must also represent the agent argument in their lexical semantics.

- The main piece of evidence comes what Bale (2007) calls *subjectless presuppositions*, namely repetitive presuppositions in which the presupposed previous event need not have been carried out by the same agent argument than the asserted event.

- Following Ausensi et al. (2020), I show that *again* yields different repetitive presuppositions depending on whether the root actually represents the agent argument internally within its lexical semantics.

- Namely, $\sqrt{\text{MURDER}}$-type roots systematically disallow subjectless presuppositions, in contrast to roots of the $\sqrt{\text{KILL}}$ type, which freely allow them, strongly suggesting that, at least for some classes of roots, the agent argument needs to be represented in their truth-conditional content, contra Kratzer (1996) *et seq*.

3.3.1 Subjectless presuppositions

- Bale (2007) differentiates between nonstative transitive verbs such as *hit* and stative transitive verbs such as *love*, and argues that only in the former class of verbs the external argument is introduced externally to the verb.
- Bale bases his analysis on what he calls *subjectless presuppositions*, i.e., a type of repetitive presuppositions in which the presupposed previous event is of the same type but the agent argument can be different than that of the asserted event, as illustrated by the examples below (from Bale, 2007: 464).

(20) CONTEXT: Seymour's dryer broke. He called a repairwoman who simply hit the dryer until it started working. The dryer broke down two days later. So ...

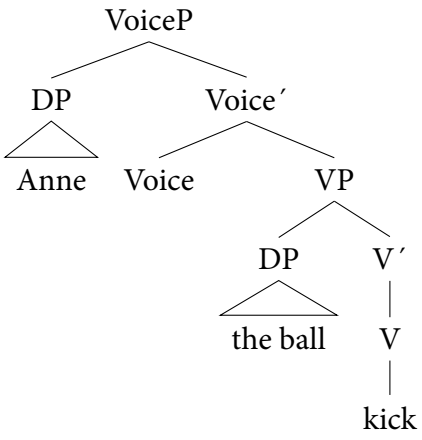
a. Seymour hit the dryer again.
b. #Again Seymour hit the dryer.
c. The dryer was hit again.

(21) CONTEXT: Brendan kicked the soccer ball towards the net, but it didn't quite make it. So ...

a. Anne kicked it again.
b. #Again Anne kicked it.
c. It was kicked again.

- The availability of subjectless pressuppositions in the case of nonstative transitive verbs like *kick* is predicted by Kratzer (1996), insofar as *again* can attach to the VP below the Voice projection introducing the external argument, and therefore the presupposition only makes reference to the event denoted by the verb and the internal argument (cf. (22)). This predicts that a prior event with a distinct agent argument is possible, as in (20) and (21).

(22) Anne kicked the ball. (based on Alexiadou et al., 2015: 7)



- I show that √MURDER-type roots associate with the external argument internally instead of externally.[2]

[2] Further see Smith & Yu (submitted) for the claim that even intransitive verbs do not appear to constitute a uniform class

- In this respect, there is a further contrast between $\sqrt{}$MURDER-type and $\sqrt{}$KILL-type roots, i.e., only $\sqrt{}$KILL-type roots allow subjectless presuppositions, whereas $\sqrt{}$MURDER-type roots systematically reject them.

- This strongly suggests that such classes of roots associate with the external argument rather differently. According to Bale (2007), as well as Kratzer (1996), both classes of verbs are expected to allow subjectless presuppositions, since they should contain a position where *again* can attach to that excludes the external argument. Yet, this only holds for $\sqrt{}$KILL-type roots. Compare this below.

(23) a. CONTEXT: In a Hollywood monster movie, Seymour's father killed the zombie. But, being a Hollywood movie, of course it came back to life. But in the end ...
Seymour killed the zombie again.
Seymour's father killed the zombie again.

b. CONTEXT: In a Hollywood monster movie, Seymour's father murdered/slew the zombie. But, being a Hollywood movie, of course it came back to life. But in the end ...
#Seymour murdered/slew the zombie again.
Seymour's father murdered/slew the zombie again.

(24) a. CONTEXT: In a Hollywood monster movie, Seymour's father killed the zombies. But, being a Hollywood movie, of course they came back to life. But in the end ...
Seymour killed the zombies again.
Seymour's father killed the zombies again.

b. CONTEXT: In a Hollywood monster movie, Seymour's father massacred/slaughtered the zombies. But, being a Hollywood movie, of course they came back to life. But in the end ...
#Seymour massacred/slaughtered the zombies again.
Seymour's father massacred/slaughtered the zombies again.

- The availability of subjectless presuppositions for $\sqrt{}$KILL-type roots is predicted by Kratzer and Bale, insofar as *again* attaches to the VP before combining with the Voice head that introduces the external argument.

- The fact that $\sqrt{}$MURDER-type roots disallow subjectless presuppositions is rather unexpected insofar as the same attachment site of *again*, excluding the external argument, should also be available for $\sqrt{}$MURDER-type roots, insofar as verbs derived from this class of roots are nonstative transitive verbs, just like *kill*.

- I conclude then that $\sqrt{}$MURDER-type roots represent the agent argument internally within their lexical semantics, in contrast to $\sqrt{}$KILL.

(25) $[\![\sqrt{}\text{MURDER-type}]\!] = \lambda x \lambda y \lambda s[\textit{dead}(x,s) \wedge \exists e \exists e'[\textit{cause'}(e,e') \wedge \textit{become'}(e',s) \wedge \forall v[\textit{cause}(v,e') \rightarrow \textit{causer}(y,v) \wedge \exists z[\textit{intend}(y)(\textit{cause}(v,v') \wedge \textit{become'}(v',s') \wedge \textit{dead}(z,s')]]]]$

with regard to how they associate with the external argument.

(26) $[\![\sqrt{\text{KILL}}]\!] = \lambda x \lambda s[dead'(x, s) \wedge \exists e' \exists v[cause'(v, e') \wedge become'(e', s)]]$

- Such a crucial difference in the lexical semantic representation of $\sqrt{\text{KILL}}$-type and $\sqrt{\text{MURDER}}$-type roots straightforwardly accounts for the difference in the types of repetitive presuppositions as well as entailments of intentionality.
- In the case of $\sqrt{\text{KILL}}$-type roots, *again* can attach after the root has combined with the entity that the state of being dead is predicated of.
- Insofar as $\sqrt{\text{KILL}}$-type roots do not entail intentionality or represent the agent argument, there is not an intentionality requirement and, crucially, the agent argument need not be the same.
- On the other hand, $\sqrt{\text{MURDER}}$-type roots only combine with *again* when both the entity that the state of being dead is predicated of as well as the entity that causes such a state have combined with the root.

3.3.2 The syntax of $\sqrt{\text{MURDER}}$-type roots

- An important question related to this root class is whether functional heads like Voice or the verbalizing little *v* head still introduce intentionality entailments and the external argument when they are combined with this root class.
- Alternatively, it could be the case that in the presence of roots that contain structural components of meaning, functional heads like Voice or *v* could receive this type of information from other levels of representation.
- I propose that when roots introduce structural components of meaning, the whole meaning of the event structure can be determined by roots and functional heads like the verbalizing little *v* head and Voice are then semantically inert, i.e., contextual allosemy (see Schäfer, 2008; Wood, 2012; Myler, 2014; Wood & Marantz, 2017; Merchant, 2019).
- As we noted in Ausensi et al. (2021b), this can be captured by using a spell out rule within the Distributed Morphology tradition so that the meaning of the verbalizing *v* head is sensitive to the identity of the root that it verbalizes.
- Namely, *v* can be interpreted as semantically inert in the context of certain classes of roots such as $\sqrt{\text{MURDER}}$-type roots, i.e., it is semantically an identity function that returns the denotation of its sister unaltered.

(27) $[\![v]\!] \rightarrow \lambda F.F$ / ___ $\sqrt{\text{MURDER}}$-type

- Under this analysis, the semantics of the whole syntactic context is provided solely by the root as the root introduces entailments of causation, change and intentionality. In other words, the semantics associated with an intentional change of state event denoted by a predicate like *John murdered the man* is exclusively contributed by the root involved and not by the syntactic structure.

- Despite the fact that *v* is semantically inert in the context of certain classes of roots, it is still necessary if one assumes a syntactic decompositional analysis along the lines of the Distributed Morphology insofar as it is the functional head that is taken to verbalize the acategorial root.

- Concomitantly, although one might be tempted then to conclude that functional heads such as Voice are no longer necessary for √MURDER-type roots, as they represent the agent argument internally, I propose, following Schäfer (2008), Myler (2014), Alexiadou et al. (2015), Wood & Marantz (2017), Yu (2020), that Voice is nonetheless present insofar as it assigns accusative case regardless of whether it introduces a thematic role.

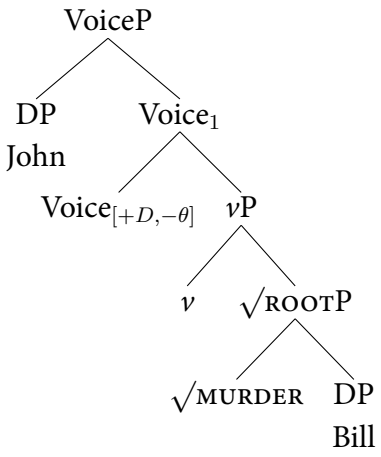
- Namely, assignment of accusative case is tied to Voice introducing an argument in its specifier rather than its semantic content. This presupposes thus that there exists a flavor of Voice that introduces an argument and assigns accusative case to it, but crucially it does not assign a thematic role to this argument, i.e., $\text{Voice}_{[+D,-\theta]}$.

- The argument Voice introduces is in turn assigned its semantic role by some constituent lower down in the structure, which remains unsaturated until Voice is combined, i.e., the root. Semantically, this can be implemented if $\text{Voice}_{[+D.-\theta]}$ is interpreted as a type-neutral identity function in the context of a *v*P formed with certain classes of roots, such as √MURDER-type roots (Schäfer, 2008; Wood, 2012; Myler, 2014; Alexiadou et al., 2015; Wood & Marantz, 2017; Yu, 2020).[3]

(28) $[\![\text{VOICE}_{[+D,-\theta]}]\!] \rightarrow \lambda F.F$ / ___ $[_{vP}\ v\ \sqrt{\text{MURDER-type}}]$

- Putting everything together, a predicate like *John murdered Bill* would have the following syntax and semantics.

(29) John murdered Bill. (from Ausensi et al., 2021b)



[3] As we discuss in Ausensi et al. (2021b), proposing that functional heads like *v* and Voice are semantically inert with roots that introduce structural components of meaning accounts for the fact that √MURDER-type roots disallow subjectless presuppositions as well as repetitive presuppositions that do not entail intentionality associated with the external argument in the previous event. In particular, if *v* and Voice are semantically inert, then *again* can only attach at the VoiceP level, i.e., the position in which the agent arguments of *murder*-type verbs are introduced. In Ausensi et al. (2021b) we note that *v*P, i.e., the attachment site in which subjectless presuppositions are generated with other types of transitive eventive verbs like *hit* or *kill*, following the discussion in Bale (2007), is not of the correct semantic type to attach, therefore providing an answer to why subjectless presuppositions are not generated with *murder*-type verbs. See Ausensi et al. (2021b).

(30) a. $[\![\sqrt{\text{MURDER}}]\!]$: $\lambda x.\lambda y.\lambda e[\text{CAUSER}(e) = y \wedge \sqrt{\text{MURDER}}(e) \wedge \text{THEME}(e) = x]$
b. $[\![\sqrt{\text{ROOTP}}]\!]$: $\lambda y.\lambda e[\text{CAUSER}(e) = y \wedge \sqrt{\text{MURDER}}(e) \wedge \text{THEME}(e) = \textit{bill}]$
c. $[\![v]\!]$: $\lambda F.F$
d. $[\![v\text{P}]\!]$: $\lambda y.\lambda e[\text{CAUSER}(e) = y \wedge \sqrt{\text{MURDER}}(e) \wedge \text{THEME}(e) = \textit{bill}]$
e. $[\![\text{VOICE}_{[+D,-\theta]}]\!]$: $\lambda F.F$
f. $[\![\text{VOICE}_1]\!]$: $\lambda y.\lambda e[\text{CAUSER}(e) = y \wedge \sqrt{\text{MURDER}}(e) \wedge \text{THEME}(e) = \textit{bill}]$
g. $[\![\text{VOICEP}]\!]$: $\lambda e[\text{CAUSER}(e) = \textit{john} \wedge \sqrt{\text{MURDER}}(e) \wedge \text{THEME}(e) = \textit{bill}]$

- Under this analysis, the functional heads such as Voice and *v* are semantically inert since their sole purpose is to either introduce the external argument syntactically or verbalize the acategorial root. Namely, on this view functional heads do not determine the semantic interpretation of the external argument they introduce, i.e., whether it is to be interpreted as an Agent, Causer etc., or the interpretation of the event.

- That is, when roots are semantically rich in that they introduce structural components of meaning like change, causation or intentionality, the role of the functional heads is simply to fulfill syntactic requirements such as case assignment or the syntactic introduction of arguments and roots in this case determine the semantics of the event structure.

- Thus, in a predicate involving a root of the $\sqrt{\text{MURDER}}$ type, the entailments of intentionality associated with the external argument as well as the caused change of state interpretation is solely introduced by the root and not by the syntactic structure (see also Yu, 2020).

4 Directed motion entailments in the semantics of roots

- I analyze the grammatical behavior of so-called directed motion verbs such as *arrive, leave, enter* etc. (cf. Levin, 1993; Moro, 1997; Irwin, 2012; Rappaport Hovav, 2014) and argue that the change of location entailment typical of this verb class can also be encoded within the root itself.

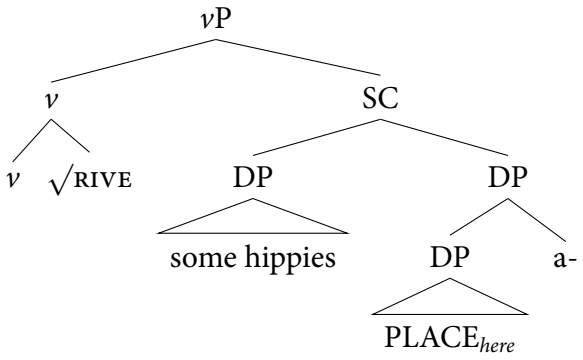
- Namely, the change of location interpretation associated with a theme argument as in an example like *John arrived in Barcelona* can also be determined by the root itself, rather than by the syntactic structure.

- Regarding directed motion verbs such as *arrive*, syntactic decompositional analyses have also proposed that the change of location entailment is introduced by some functional projection in the syntax, and not by the root (cf. Moro, 1997; Irwin, 2012, 2018, 2020).

- In this vein, Irwin (2012) has recently argued that directed motion verbs of the *arrive* type syntactically decompose into a root and a locative morpheme following the proposal by Moro (1997) for similar verbs in Italian.

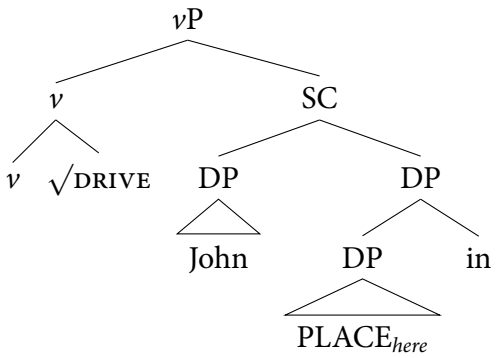
- Drawing on Moro, Irwin thus extends the analysis to English and proposes to syntactically decompose *arrive* into a root $\sqrt{\text{RIVE}}$ and a locative morpheme *a-*, as shown below.

(31) Some hippies arrived. (Irwin, 2012: 107)



- In Irwin's analysis, the root √RIVE is merged as an event modifier to *v*, whereas the locative morpheme *a-* further specifies the PLACE$_{here}$, which is responsible for introducing the result state, i.e., being in some location, and *a-* moves to prefix to √RIVE.
- Irwin notes that the morpheme *a-* is similar to the particles in so-called particle verb constructions such as *drive in* or *pull up*.
- Irwin then proposes that the roots of directed motion verbs such as √RIVE and the roots of the verbs in particle verb constructions such as √DRIVE are both merged as event modifiers to *v* providing the manner by which the theme ends up on the new location.
- In the case of particle verb constructions, the result state is also structurally introduced by the small clause predicate, where a particle, e.g., *in*, provides further specification about it.

(32) John drove in. (adapted from Irwin, 2012: 110)



- Irwin's analysis of *arrive*-type verbs (also Moro, 1997) and particle verb constructions thus predicts that sublexical modifiers should be able to pick out the result state of being at a location to the exclusion of the manner.
- For instance, *again* should generate a restitutive reading with *arrive* where there is a previous state of the theme being in a particular location, parallel to cases where *again* generates restitutive readings

as it can scope over the result state to the exclusion of the manner when they are provided by different roots as is the case of resultative constructions, e.g., *hammer the metal flat*.

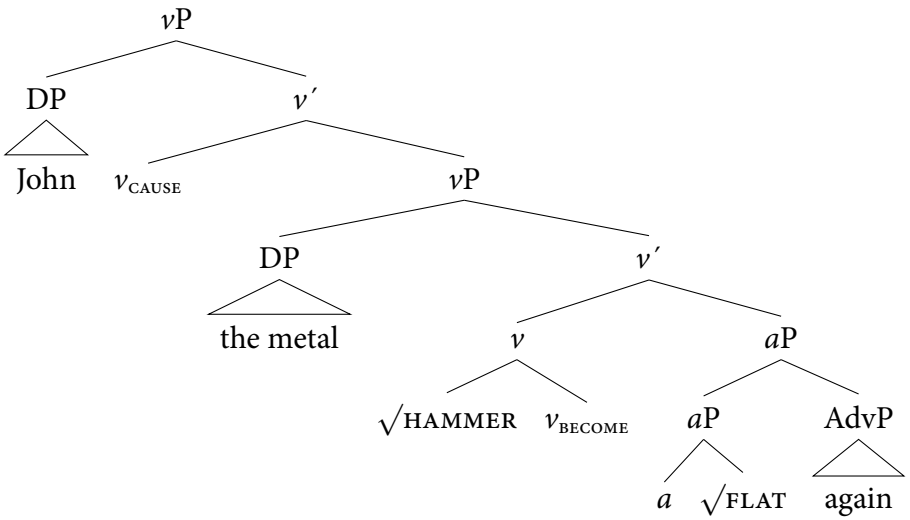
- Namely, if manner and result are encoded in separate roots, sublexical modification with *again* should be able to scope over the result to the exclusion of the manner (Beck & Snyder, 2001; Beck & Johnson, 2004; Beavers & Koontz-Garboden, 2012).

- This is predicted since in resultatives manner and result entailments are encoded in two different roots, and *again* can scope over one to the exclusion of the other, as illustrated in (33).

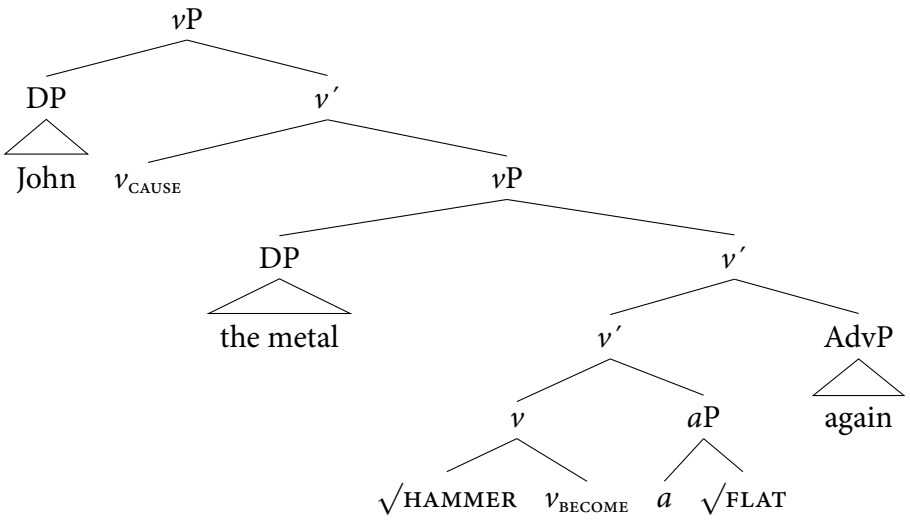
(33) Mary made a sheet of metal that is flat, but it later accidentally became bent. Fortunately, John hammered the metal flat again.

- Namely, the reading in (33) is restitutive since the metal does not need to have been hammered in a previous stage or even flattened (Beavers & Koontz-Garboden, 2012: 357), as *again* is scoping just over the result to the exclusion of the manner, which is provided by the root $\sqrt{\text{HAMMER}}$, adjoined to *v*. Compare this below.

(34) Low scope of *again*, i.e., just over the result (= restitutive).

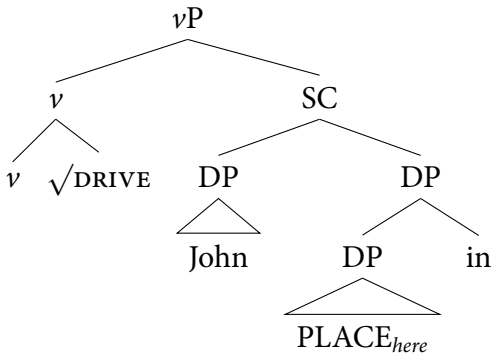


(35) High scope of *again*, i.e., over the manner and result (= repetitive).



- On this logic, particle verb constructions should also allow the same type of restitutive readings insofar as they share the same syntactic decompositional analysis under Irwin's approach.

(36) John drove in.



- In fact, such restitutive readings are indeed available, suggesting that the decompositional analysis Irwin gives to particle verb constructions appears to be correct.
- This is illustrated in the following examples in which the manner of action that brings about the state of being in some location in the previous event is different from the manner of the asserted event. In this case thus a repetitive reading is not possible insofar as *again* attaches to the predicate contributing the result state and it therefore generates a restitutive interpretation.

(37) a. CONTEXT: John previously walked here, but he later left. After a while ...
John drove here again. (Restitutive OK)

b. CONTEXT: The dog previously walked into the room, but it later ran out. After a while ...
The dog bounced in again. (Restitutive OK)

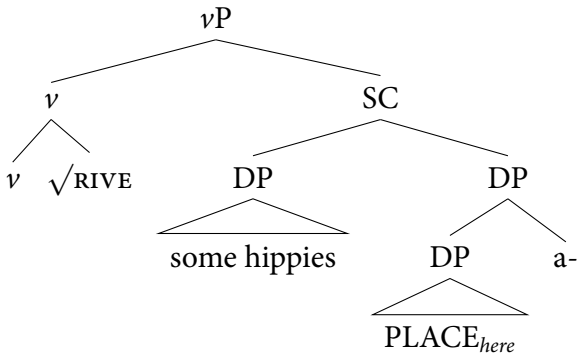
c. CONTEXT: Tom had previously walked out of the room, but he later came in. After a while ...
Tom ran out again. (Restitutive OK)

- In particular, the fact that *again* can generate restitutive presuppositions in this case is actually predicted by Irwin's analysis since *again* attaches to the small clause predicate to the exclusion of the manner contributed by the root, which is higher up in the structure, as a modifier to *v* (cf. (36)).
- However, contra Irwin, directed motion verbs of the *arrive* type do not allow restitutive presuppositions.
- This is illustrated below for *arrive* which when modified with *again* generates clear contradictions in contexts in which the only possible reading is that of a restitutive one.
- Namely, the examples below make explicit reference to contexts in which the interpretation when modified with *again* is only of a restitutive type, i.e., they state that there is an entity that was born in a place, so that there was no previous causing event that led to that entity to be in that place in a previous stage.
- In these contexts, *arrive* cannot be modified with *again*, therefore strongly suggesting that *arrive* does not allow restitutive presuppositions.

(38) a. CONTEXT: John was born here, and stayed here until he left when he grew up. After some years ...
#John arrived again. (#Restitutive)
b. CONTEXT: John was born in Chicago, and stayed there until he left for Boston when he grew up. After some years ...
#John arrived in Chicago again. (#Restitutive)

- Under Irwin's account in which *arrive*-type verbs and particle verb constructions have the same structure, the contrasts above are rather mysterious.

(39) Some hippies arrived.



- The contrasts seem to show that in the case of *arrive*, *again* cannot scope just over the result state, as in *drive in*. In other words, Irwin's analysis, as well as Moro's, predicts that directed motion verbs like *arrive* should allow restitutive readings, insofar as their structure is the same as particle verb constructions.

- What these contrasts seem to strongly suggest is that in the case of directed motion verbs of the *arrive* type, the root entails change as part of its truth-conditional content. In other words, the change of location interpretation typical of this verb class seems to be contributed by the root.

- In this case, the roots of verbs like *arrive* would predicate a state of being located in some place as a result of a change, which would be encoded in the root itself and not introduced syntactically. In this respect, a possible denotation for a root like $\sqrt{\text{ARRIVE}}$ could be the following one.

(40) $[\![\sqrt{\text{ARRIVE}}]\!] = \lambda y \lambda x \lambda s[\textit{be-at'}(x, y, s) \wedge \exists e'[\textit{become'}(e', s)]]$

- If this analysis is on the right track, we should expect then that a restitutive presupposition should not be available for this verb class insofar as $\sqrt{\text{ARRIVE}}$ would be a predicate of states that entails an event of change.

- Thus, modification with *again* would necessarily include the event of change the root encodes generating repetitive presuppositions, and never restitutive ones, as illustrated above in (38).[4]

5 Conclusion

- In this talk, I have provided a more nuanced view of the types of semantic entailments roots can have in contrast to the meanings introduced by event templates.

- The overall picture is that the meanings roots and event templates introduce need not be mutually exclusive insofar as there are certain classes of roots that can introduce structural components of meaning and in turn determine the semantics of the predicates they occur in.

- This argues against the standard assumption in syntactic decompositional theories of verb meaning that the semantics of the syntactic context is solely determined by the event templates, defined by functional heads in the verbal domain, and never by roots (Borer, 2003, 2005b, 2013; Mateu & Acedo-Matellán, 2012; Acedo-Matellán & Mateu, 2014; Alexiadou et al., 2015).

- In particular, I have proposed that when roots introduce structural components of meaning, roots are then capable of imposing semantic restrictions on the syntactic structures they associate with.

- This points to a direction in which there are semantic components of the event structure that need not be represented in the syntax, but can be encoded directly within the root.

[4] Further see Ausensi et al. (2021a) for discussion about the behavior of other directed motion verbs with respect to sub-lexical modification and the type of truth-conditional content they encode. The overall picture is that directed motion verbs do not constitute a uniform class of verbs with regard to whether the root entails change or not. Our main piece of evidence comes from the type of presuppositions directed motion verbs generate with *again* and durative *for*-phrases.

- An important consequence of this approach then is that syntax can be assumed to be *simpler* (cf. Culicover & Jackendoff, 2005, 2006) insofar as certain structural components of meaning can be encoded directly within the root and consequently need not be represented in the syntactic structure at all.

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