Agentless Presuppositions and the Semantics of Verbal Roots[*]

Ryan Walter Smith   Jianrong Yu

August 27, 2020

Abstract

Bale (2007) proposes that agentive intransitives differ semantically from agentive transitives, in that while the agent of a transitive is introduced by a functional projection and composes with its verb via EVENT IDENTIFICATION (Kratzer, 1996), intransitives lexically encode their agent arguments and compose with them via FUNCTION APPLICATION. This is based on the availability of agentless repetitive presuppositions with *again*, with transitives permitting a repetitive presupposition excluding the agent while intransitives do not. In this paper, we challenge Bale's claim and show that typically intransitive verbs like *dance* and *bark*, which do not usually allow agentless presuppositions, permit agentless presuppositions when they appear with an optional internal argument. To account for this, we propose that verbal roots possess an underspecified *thematic role* argument, along with individual and event arguments. Combined with a conservative syntax for introducing agents via VoiceP (Kratzer, 1996), the analysis captures the dependence of agentless presuppositions on the presence of an internal argument without recourse to any distinction between transitive and intransitive eventive verb roots. The analysis is then extended to *out*-prefixation, which has recently been used as an argument for syntactic and semantic severing of all arguments from the verb (Ahn, 2020). The analysis contributes a new theory of roots lying between two theoretical poles, one that argues that roots take internal arguments (Harley, 2014) and one that severs internal arguments syntactically and semantically from the verb (Schein, 1993; Borer, 2003, 2005; Ramchand, 2008; Ahn, 2020).

1   Introduction

In the literature on argument structure, it has been widely argued that agents are distinguished from other arguments in being introduced outside the domain

of the verb root (Marantz, 1984; Kratzer, 1996; Harley, 2013; Pylkkänen, 2008, a.o.). Kratzer (1996), for example, suggests that agents are introduced by a functional head VOICE, which composes with the VP through a rule of EVENT IDENTIFICATION. Nevertheless, Kratzer's (1996) proposal has been challenged over the years by various authors (e.g. Horvath and Siloni, 2003; Wechsler, 2005; Bale, 2007, a.o., but see Harley and Stone, 2013 for a response). In this vein, Bale (2007) shows that Kratzer's (1996) proposal, while being essentially correct for eventive transitive verbs, fails to extend to all verb classes. In particular, Bale uses sub-lexical modification with *again* to demonstrate that while the subject of an eventive transitive verb may be excluded from the presupposition of *again*, those of intransitive verbs and stative transitive verbs may not. Bale concludes that only the agents of eventive transitive verbs are severed from the verb, while those of intransitive verbs, like the experiencer argument of transitive stative verbs, are arguments of the verb proper.

In this paper, we argue against Bale's (2007) claim that agentive intransitives take their agent arguments directly. Using agentless presuppositions with *again* as a diagnostic, we show that typically intransitive verbs like *dance* and *bark*, which do not typically allow agentless presuppositions, permit agentless presuppositions when they appear with an optional internal argument. We use this to motivate the INTERNAL ARGUMENT GENERALIZATION, stated in (1), which refines Bale's original claim.

(1) INTERNAL ARGUMENT GENERALIZATION:
     Presuppositions with *again* that exclude the agent are only possible when an internal argument is present.

We will show that this generalization is not fully accounted for by analyses like Bale's, which posit that intransitive verbs compose with their agent argument directly. However, Kratzer's approach, with uniform introduction of the agent via VOICE, fares no better without modification. As an alternative, we propose that the availability of agentless presuppositions is not determined by differences between transitives and intransitives as classes in and of themselves, but depends on the presence of absence of arguments introduced by the structure in which a verbal root is embedded. In so doing, we propose a novel analysis of the semantics of eventive verb roots: verb roots possess a *thematic role* argument, conceived as a function of type $<e,<v,t>>$, along with individual and event arguments. These thematic roles are introduced by functional heads within the verbal projection, such as little v and VOICE, and roots compose with these thematic role denotations directly via FUNCTION APPLICATION. A sample denotation for such a root is given in (2).

(2) Denotation of a root
     $\sqrt{\text{ROOT}} \rightsquigarrow \lambda f_{e,vt}.\lambda x.\lambda e.\text{ROOT}(e) \wedge f(x)(e)$

Combined with a standard approach to the semantics of *again* as an event modifier (e.g. von Stechow, 1996; Beck and Johnson, 2004; Bale, 2007, a.o.) and the introduction of agents via VoiceP in the syntax (Kratzer, 1996), our analysis

allows us to capture the dependence of the availability of agentless presuppositions on the presence of an internal argument: when v introduces no thematic role, and acts as an identity function on root denotations, the root composes with VOICE, and the only projection of the appropriate semantic type for *again*-modification is VoiceP. If, however, v does introduce a thematic role, there will be two type-appropriate adjunction sites for *again*, one of which, vP, excludes the agent. In this way, our analysis captures both the phenomena originally noticed by Bale as well as the new data we report here, while maintaining a uniform syntax for the introduction of agents and other arguments (Kratzer, 1996). On a broader theoretical level, our analysis motivates a novel treatment of verbal roots that constitutes a middle ground between two poles in the previous literature: while our approach endows intransitive roots with an individual argument as in Kratzer (1996) and Harley (2014), this argument is underspecified for thematic role, and is syntactically introduced by functional projections dominating the root (c.f. Schein, 1993; Borer, 2003, 2005; Lohndal, 2012; Ahn, 2020, a.o.).

The paper is structured as follows. Section 2 provides the theoretical background on severing the agent argument from the verb, the semantics of *again*, and Bale's (2007) use of agentless presuppositions to argue for a semantic distinction between transitive and intransitive eventive verbs. Section 3 presents our counterargument in favor of the INTERNAL ARGUMENT GENERALIZATION, demonstrating flaws in Bale's original generalization and showing that verbs that disallow agentless presuppositions when intransitive permit them when they appear with an internal argument. Section 4 develops the formal analysis, deriving the INTERNAL ARGUMENT GENERALIZATION from the interaction of the semantics of the root with the presence or absence of additional thematic material in the extended projection of the VP. Section 5 situates the discussion in a broader theoretical landscape with respect to the semantics of roots, and demonstrates that the proposal can be immediately extended to an analysis of *out*-prefixation, which has recently used as an argument in favor of syntactic and semantic severing of the internal argument from the verb (Ahn, 2020). Section 6 concludes.

2 Agentless Presuppositions and Severing the External Argument

Marantz (1984) observes that while internal arguments of verbs can condition special interpretations of a verb, external arguments never do. Thus, the truth-conditional meaning of the verb *kill*, for example, is dependent on the denotation of its internal argument; such conditioning of a verb's meaning, on the other hand, is almost never observed with agents.[1]

(3) a. kill a cockroach

---

[1]See Harley and Stone (2013) for a recent review and arguments against counterexamples.

    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 them)

In response to Marantz's observation, Kratzer (1996) proposes that external arguments are introduced by a functional head VOICE, and compose with the VP via a special composition rule of EVENT IDENTIFICATION. Adopting a standard notation for semantic types, where e is the type of entities, v the type of events, and t the type of truth values, EVENT IDENTIFICATION takes a function of type $<e,<v,t>>$ and a function of type $<v,t>$ and returns a new function that, when supplied with an individual and event argument, returns the conjunction of the result of the two original functions. VOICE, then, is a function of type $<e,<v,t>>$ introducing thematic roles like AGENT.

(4) EVENT IDENTIFICATION:
     $f_{e,vt} + g_{vt} \rightarrow \lambda x.\lambda e.f(x)(e) \wedge g(e)$

(5) $[\![\text{VOICE}]\!]$: $\lambda x \lambda e.\text{AGENT}(e) = x$

Bale (2007), however, argues that not all external arguments can be severed from the verb in this way, making use of the range of repetitive presuppositions with *again* as a diagnostic for syntactic decomposition. Formally speaking, *again* is a function of type $<<v,t>,<v,t>>$, being an identity function in the assertion and introducing a presupposition that an identical event had happened temporally prior to the asserted event (Dowty, 1979; von Stechow, 1996; Beck and Johnson, 2004, a.o., lexical entry adapted from Bale, 2007).

(6) $[\![again]\!]P(e)$ is defined iff $\exists e^1 \exists e^2 [e^1 \prec e^2 \prec e$ & $P(e^1)$ & $\neg P(e^2)]$.
     When defined, $[\![again]\!]P(e) = P(e)$.

Under Kratzer's (1996) proposal, VP prior to combining with VOICE is a function of type $<v,t>$, meaning that it is an available attachment site for *again*, which can take the VP as its argument. Attaching *again* to VP prior to combining with VOICE would thus produce a presupposition of an earlier event of the type denoted by the VP but crucially excluding the external argument. Bale (2007) shows that such *subjectless presuppositions* are indeed produced with non-stative transitive verbs (e.g. *hug, kick, rake*). With these verbs, contexts with a prior event containing a *different agent* from the asserted event can satisfy *again*'s repetitive presupposition, suggesting that Kratzer's proposal is essentially correct for these verbs (example (29a) in Bale, 2007).

(7) 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...
     Seymour hit the dryer again.

However, Bale (2007) shows that not all verb classes permit presuppositions excluding the subject. For example, stative transitive verbs (e.g. *hate, love, own, doubt*) and all intransitive verbs (e.g. *run, arrive*), are incompatible with subjectless presuppositions, as shown in the following contexts with *love*, *run*, and *arrive* (examples (47a), (54), and (55) in Bale, 2007). Note that the passive is felicitous for stative transitive verbs, supporting the observation that *again*'s presuppositions can make reference to a constituent lacking an overt and syntactically expressed external argument.

(8)   CONTEXT: Seymour's mother loved Frank, although she was the only one who did. After a while she no longer cared for him. However, Seymour became attached to the man, and developed strong feelings for him after his mother's love subsided. So...

    a.   **# Seymour loved Frank again.**

    b.   **Frank was loved again.**

(9)   CONTEXT: Seymour's wife was the first person ever to arrive at the new airport. Then a week later...
    # Seymour arrived again.

(10)   CONTEXT: Last week, Jon's wife ran all morning. Then after she got home, Jon was able to do some exercise. So...
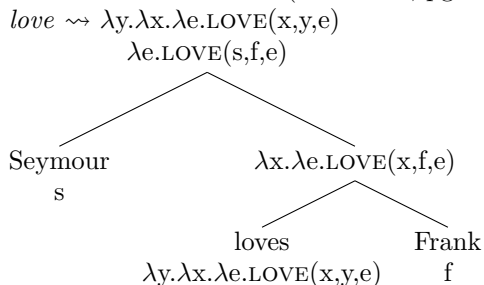   **# Jon ran again.**

This set of facts can be summarized by the statement in (11), which we term BALE'S GENERALIZATION.

(11)   BALE'S GENERALIZATION:
Presuppositions with *again* that exclude the subject are only possible with non-stative transitive verbs. They are not possible with stative transitive verbs or intransitive verbs.

Bale concludes from his generalization that the external arguments of stative transitive verbs and intransitive verbs must not be severed and introduced by VOICE, unlike the agent arguments of non-stative transitives; such an analysis would predict the uniform availability of subjectless presuppositions across all verb classes. Rather, Bale reasons, the experiencer of stative transitives and the agent of unergatives must be lexically encoded in the verb and taken as arguments directly, with no intervening functional head introducing the thematic role and these arguments. That is, stative transitive verb roots must be functions taking two individuals and one event argument, and are thus of type $<e,<e,<v,t>>>$, as shown in (12). In this case, *again* can only attach after both individual arguments have been saturated, predicting the impossibility of a subjectless presupposition.[2]
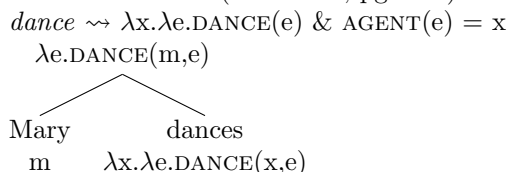
---

[2]Following Bale, we provide both Davidsonian and Neo-Davidsonian translations for the verbs in (12) and (13), and use the Davidsonian translation in the trees (Davidson, 1967; Castañeda, 1967) In other examples, we will make use of Neo-Davidsonian representations

(12) Stative transitive verbs (Bale 2007, pg. 472)
$love \leadsto \lambda y.\lambda x.\lambda e.\text{LOVE}(x,y,e)$

$\lambda e.\text{LOVE}(s,f,e)$

```
            λe.LOVE(s,f,e)
           /            \
      Seymour      λx.λe.LOVE(x,f,e)
         s            /         \
                   loves        Frank
            λy.λx.λe.LOVE(x,y,e)   f
```

Likewise, intransitives are uniformly functions from individuals to predicates of events of type $<e,<v,t>>$. Therefore, unergative verbs like *dance* require their agent argument to be saturated before producing a constituent of the right semantic type for modification by *again*. In this way, the agent of such verbs will always be included in *again*'s presupposition when it modifies the VP.

(13) Intransitive verbs (Bale 2007, pg. 472)
$dance \leadsto \lambda x.\lambda e.\text{DANCE}(e) \text{ \& } \text{AGENT}(e) = x$

$\lambda e.\text{DANCE}(m,e)$

```
        λe.DANCE(m,e)
         /        \
      Mary       dances
       m      λx.λe.DANCE(x,e)
```

Our focus in this paper will largely be on the behavior of agentive intransitive verbs. For this reason, we will speak of *agentless presuppositions* rather than using Bale's more general term subjectless presupposition, and only use the term subjectless presupposition when the subject is not interpreted as an agent. Note that because the agent role is part of the lexical semantics of intransitive verbs like *dance*, such verbs are expected to be completely incompatible with repetitive presuppositions of *again* that exclude the agent argument. In what follows, we demonstrate that this is, in fact, not the case.

3 Contra Bale: Agentless presuppositions track the presence of an internal argument

We show, using the same diagnostic as Bale (2007), that even distinguishing between non-stative transitives and intransitives in terms of how they associate with their agent arguments makes wrong predictions. The evidence here comes from classes of agentive intransitive verbs that may appear with an optional internal argument. We illustrate with four classes of agentive intransitive verbs that exhibit transitivity alternations: verbs of performance, *wipe* verbs, verbs

---

throughout. We will also depart from Bale in treating thematic roles as functions from events to individuals, in line with recent work in event semantics (Carlson, 1998; Landman, 2000; Champollion, 2010).

of contact, and verbs of vocalization (Levin, 1993). These verbs may appear with or without an additional argument. For performance verbs, the additional argument expresses the kind of performance or particular piece being performed (14). Contact verbs and *wipe* verbs without an object merely denote an action. For example, *John kicked* means that John moved his leg in a kicking motion without necessarily coming into contact with anything, and the optional object denotes the object affected by the contact event (16). Finally, vocalization verbs may appear with a PP argument, normally headed by the preposition *at*, which denotes the target of the vocalization event; without this optional argument, the verb denotes an action that need have no target (17).

(14) Performance verbs: *dance, recite, sing, whistle, chant*

- Unspecified object alternation:
  1. Sandy sang.
  2. Sandy sang a song/a ballad.
  3. Sandy danced.
  4. Sandy danced a jig.

(Levin, 1993, pp. 178)

(15) *Wipe* verbs: *wipe, sweep, wash, rinse scrub*

- Unspecified object alternation:
  1. Brian was wiping the counter.
  2. Brian was wiping.
  3. John swept the floor.
  4. All last night, John swept.

(Levin, 1993; Rappaport-Hovav and Levin, 2010)

(16) Physical contact verbs: *kick, punch, slap*

- Affectee alternation
  1. John kicked.
  2. John kicked Bill.
  3. John punched.
  4. John punched Bill.

(17) Vocalization verbs: *bark, growl, roar, hiss, shout, scream, snap, whisper*

- Directed-towards alternation:
  1. The dog barked.
  2. The dog barked at the cat.
  3. Susan whispered.
  4. Susan whispered at Rachel.

(Levin, 1993, pp. 205)

As shown in the contexts below, sentences with these verbs are infelicitous with agentless presuppositions of *again* when used intransitively. However, an agentless presupposition becomes possible when an internal argument is present.

(18) CONTEXT: At a ball in honor of the king, John danced the Irish jig. The king was so impressed that he had his court dancer James learn this dance, and...

    a. **# James danced again.**

    b. **James danced the Irish jig again.**

(19)   a. CONTEXT: John decided to clean up the house he and Mary lived in ahead of a party so he swept. The next day, Mary, thinking John did not clean, picked up the broom and...
      #Mary swept again.

  b. CONTEXT: John decided to clean up the house he and Mary lived in ahead of a party so he swept the floor. The next day, Mary, thinking John did not sweep the floor, picked up the broom and...
      Mary swept the floor again.

(20)   a. CONTEXT: John and Bill were in an accident, and are unconscious in a hospital bed. One night, after not moving for a long time, a nurse sees John kick. She watches a bit longer, and then...
      #Bill kicks again.

  b. CONTEXT: John kicks his friend Joe. Later...
      Bill kicks Joe again.

(21) CONTEXT: A cat named Milo walked down the street. Rover barked at him through the fence. Milo passes another yard, where Fido noticed him, and...

    a. **# Fido barked again.**

    b. **Fido barked at him again.**

These facts are unexpected if we assume with Bale (2007) that agentive intransitive verbs take their agent arguments directly as arguments, since in the (b) examples it would seem like the agent argument can be outside the scope of *again*'s presupposition. This suggests that there is indeed a constituent available that excludes the agent argument, contradicting Bale's evidence. On the other hand, if we take the felicity of (18b-21b) to mean that these verbs can have their agents introduced by VOICE, then the (a) examples remain unexplained, since there should be a constituent that excludes the agent argument of the appropriate type for modification by *again*. Given Bale's approach to the problem, we run into an apparent paradox: we would seem to have to introduce the agent argument VP-internally in some cases, but VP-externally in others.

    A straightforward "solution" would be to assume two variants of these verbs: an intransitive variant, which lexically encodes its agent, and a transitive one, which does not and must associate with the agent via VOICE. This would

account for the facts in a way compatible with Bale's analysis, but it comes at a great cost. First, it results in a proliferation of lexical entries that are identical except for the fact that one appears with a lexically specified agent argument and the other with a lexically specified theme. More importantly, however, such an analysis misses an important generalization about the availability of agentless presuppositions: in the presence of an internal argument, the agent may be excluded from the presupposition of *again*, but in its absence, such a presupposition is unavailable. We state this below as the INTERNAL ARGUMENT GENERALIZATION.

(22) INTERNAL ARGUMENT GENERALIZATION
      Presuppositions with *again* that exclude the agent are only possible when an internal argument is present.

This generalization is very similar to Bale's, in that it includes transitive expressions with agents and excludes stative verbs, and intransitives that cannot be optionally transitive. It differs from Bale's original claim in that it does not tie the differential availability of subjectless presuppositions with *again* to particular classes of verbs differing in their transitivity, but rather specifies the possibility of transitivity alternations as the relevant factor regulating the possibility of such presuppositions. In other words, it does not imply an analysis whereby (in)transitivity is reified in the lexical entries of particular verbs, but permits an analysis that accounts for the flexibility of certain kinds of verbs without multiplying lexical entries beyond necessity. In what follows, we develop just such an analysis that derives the INTERNAL ARGUMENT GENERALIZATION.

4 Deriving the Internal Argument Generalization

In this section, we propose an analysis that combines a uniform syntactic analysis of the introduction of the agent via a functional projection outside of the vP with a novel semantic treatment of roots, from which the INTERNAL ARGUMENT GENERALIZATION follows. The section is structured as follows. First, we develop the theoretical framework and formal machinery that we adopt for the analysis. Second, we apply these tools to an analysis of the data presented in the previous section. We conclude this section with a rebuttal of a possible counteranalysis of a subset of the daya.

4.1 Formal background

The general theoretical backdrop we adopt is that of Distributed Morphology (Halle and Marantz, 1993), where the surface verb is composed of an acategorial root combined with a functional head that determines the root's syntactic category. To this, we add the assumption that functional heads are subject to *contextual allosemy*, such that their semantic interpretations can be determined at the semantic interface based on the structure they are embedded in (Wood

and Marantz, 2017).[3] The crucial assumption we adopt here is that categorizing v heads are either interpreted as identity functions over root denotations, or can introduce a thematic role akin to how VOICE can introduce the AGENT role (Kratzer, 1996). The crucial determining context will be whether v contains a phrase in its specifier; when there is a phrase present, v may be translated as a function of type $<e,<v,t>>$ that introduces a thematic role. In the absence of an argument, v can be interpreted simply as an identity function. Importantly, these little v can receive these specific interpretations only in the presence of certain roots. We capture this by specifying the identity of the roots that condition particular interpretations of v, which we indicate with indices following Harley's (2014) claim that roots are simply indices that point to particular phonological and semantic interpretations. Under this approach, transitivity alternations are generalizations on the kinds of meanings little v heads can receive in the context of particular roots they combine with, implemented using a selectional feature on roots on these heads (Merchant, 2019).

(23) a. $[\![v]\!] \rightarrow \lambda x.\lambda e.\text{THEME}(e) = x$ / [DP [__ $\sqrt{\text{ROOT}}_{235}$ / $\sqrt{\text{ROOT}}_{563}$ / $\sqrt{\text{ROOT}}_{780}$ / ...]]
  b. $[\![v]\!] \rightarrow \lambda F.F$ / [__ $\sqrt{\text{ROOT}}_{235}$ / $\sqrt{\text{ROOT}}_{578}$ / ...]

We now turn to the semantics of the verb root itself, and how it combines with the categorizing v head. Specifically, we propose that verb roots take three arguments: an eventuality argument, an individual argument and a *thematic role* argument that relates that individual to the event, but leaves the particular role underspecified. This argument may be the AGENT role contributed by VOICE, or some other role, such as THEME or GOAL, depending on the presence of a phrase of a particular kind in the specifier of v. Formally, a verb root like $\sqrt{\text{DANCE}}$ or $\sqrt{\text{BARK}}$ is of type $<<e,<v,t>>,<e,<v,t>>>$, taking a thematic role function as its first argument, followed by an individual and an event argument.

(24) $[\![\sqrt{\text{DANCE}}]\!]$: $\lambda f_{e,vt}.\lambda x.\lambda e.\text{DANCE}(e) \wedge f(x)(e)$

4.2 Analysis

With these analytical tools in place, we can begin to see why the agentless presuppositions with *again* depend on the presence of an internal argument. Consider the intransitive variant of $\sqrt{\text{DANCE}}$, which we analyze as in (25). Since v does not introduce an argument in its specifier, it will be interpreted as an identity function as in (23b), serving to pass the denotation of its sister

---

[3] As an alternative to contextual allosemy, one could posit distinct v heads, one of which denotes an identity function over root denotations, with another denoting a thematic role function. While this choice does not affect the results of the analysis, there may be other reasons to favor one approach over another. For instance, the use of contextual allosemy rules allows us to have more fine-grained control over the distribution of particular thematic roles, where an account appealing to different kinds of v may need to appeal to additional syntactic mechanisms to ensure that certain vs are incompatible with certain roots.

unchanged higher up the structure. Notice now that the root's first argument is supplied by VOICE and thus the root's thematic role argument is saturated by the AGENT role.

(25) Intransitive argument structure

VoiceP
$\lambda e.\text{DANCE}(e) \wedge \text{AGENT}(e) = j$

- DP
  John
  j
- Voice'
  $\lambda x.\lambda e.\text{DANCE}(e) \wedge \text{AGENT}(e) = x$
  - Voice
    $\lambda x.\lambda e.\text{AGENT}(e) = x$
  - vP
    $\lambda f_{e,st}.\lambda x.\lambda e.\text{DANCE}(e) \wedge f(x)(e)$
    - v
      $\lambda F.F$
    - $\sqrt{\text{DANCE}}$
      $\lambda f_{e,st}.\lambda x.\lambda e.\text{DANCE}(e) \wedge f(x)(e)$
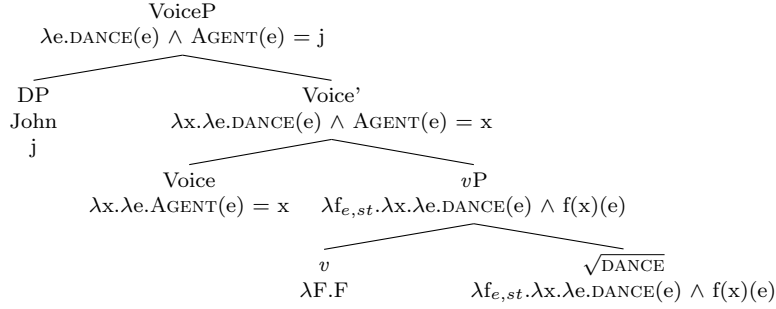
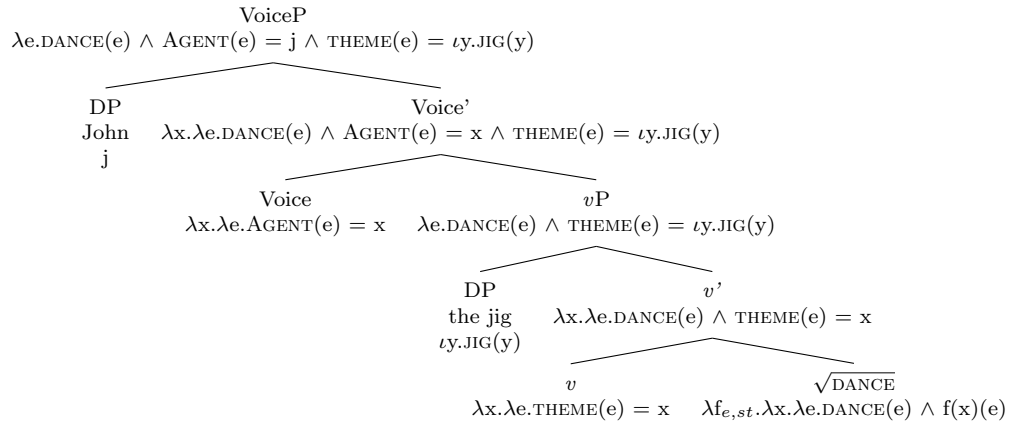Recall now that *again* is of type $<<v,t>,<v,t>>$, requiring a function of type $<v,t>$ as its first argument. The only constituent of the correct type for *again* to attach is at the VoiceP level, which includes the agent. The vP, where *again* would need to attach in order to produce an agentless presupposition, is of type $<<e,<v,t>>,<e,<v,t>>>$, the wrong type to serve as *again*'s argument. We thus successfully predict that in the intransitive variant, an agentless presupposition is not possible, in line with the INTERNAL ARGUMENT GENERALIZATION.

In the presence of an internal argument, however, little v is conditioned to have the interpretation in (23a). It is therefore semantically contentful, and serves to introduce the THEME role. The root $\sqrt{\text{DANCE}}$ takes this v as its first argument, saturating the functional argument position of the root. The DP introduced in v's specifier then saturates the root's individual argument. Because the root's thematic role argument has long since been saturated by the THEME role introduced by v, VOICE, which introduces the AGENT role, composes with vP via EVENT IDENTIFICATION.

(26) Transitive argument structure

VoiceP
$\lambda e.\text{DANCE}(e) \wedge \text{AGENT}(e) = j \wedge \text{THEME}(e) = \iota y.\text{JIG}(y)$

- DP
  John
  j
- Voice'
  $\lambda x.\lambda e.\text{DANCE}(e) \wedge \text{AGENT}(e) = x \wedge \text{THEME}(e) = \iota y.\text{JIG}(y)$
  - Voice
    $\lambda x.\lambda e.\text{AGENT}(e) = x$
  - vP
    $\lambda e.\text{DANCE}(e) \wedge \text{THEME}(e) = \iota y.\text{JIG}(y)$
    - DP
      the jig
      $\iota y.\text{JIG}(y)$
    - v'
      $\lambda x.\lambda e.\text{DANCE}(e) \wedge \text{THEME}(e) = x$
      - v
        $\lambda x.\lambda e.\text{THEME}(e) = x$
      - $\sqrt{\text{DANCE}}$
        $\lambda f_{e,st}.\lambda x.\lambda e.\text{DANCE}(e) \wedge f(x)(e)$

11

Note now that in the transitive structure, there are two constituents of type $<v,t>$ which can serve as *again*'s first argument: at the little vP level and at the VoiceP level. Attaching at VoiceP produces a repetitive reading which includes the agent argument and crucially, attaching at vP now excludes the agent argument. We thus account for the fact that the transitive variant of the verb root $\sqrt{\textsc{Dance}}$ modified with *again* permits an agentless presupposition, since such a presupposition is produced when *again* attaches to vP. This position is not available in the intransitive variant because of a semantic type clash, due to v being interpreted as an identity function as it does not introduce an argument in its specifier. The exact same analysis can be applied directly to other verbs with optional DP arguments, such as *kick* and *sweep*: in the intransitive variant, vP contains no DP in its specifier, v is interpreted as an identity function, and the AGENT role is fed into the thematic role argument of the root, ruling out any agentless presuppositions. In the transitive variant, a DP is in the specifier of vP, triggering the translation of v as introducing the THEME role and saturating the thematic role and individual arguments of the root, thus making vP a suitable argument for *again* and delivering an agentless presupposition.

Verb roots that exhibit a difference in the availability of agentless presuppositions when they take a PP argument can be analyzed the same way, modulo how exactly the semantic contribution of the head of the PP is analyzed. One analytical possibility is to analyze the head of the PP, *at*, as semantically contentful, serving to introduce the GOAL thematic role itself. On this analysis, *at* would take an individual argument corresponding to its DP complement. It also takes the *verb root* as an argument, and feeds the GOAL thematic role, the individual denoted by its complement, and an event argument to the verb root. In this way, it would ultimately produce a constituent of type $<v,t>$ which *again* could take as an argument, thereby successfully predicting the availability of an agentless presupposition. This treatment of *at* is given in (27).

(27) $\llbracket at \rrbracket = \lambda\text{x}.\lambda\text{F}.\lambda\text{e}.\text{F}(\lambda\text{y}.\lambda\text{e}.\textsc{Goal}(\text{e}) = \text{y})(\text{x})(\text{e})$

Alternatively, we can have the categorizing v itself introduce the GOAL thematic role. On this approach, *at* is semantically vacuous, denoting an identity function over individuals, and the PP headed by *at* is c-selected by v. This approach is taken by Merchant (2019), who observes that the form of a preposition for roots that take a PP as an internal argument can vary across its realizations as either a verb, noun, or adjective. A representative example with $\sqrt{\textsc{Pride}}$ is provided below.

(28)   a. She prides herself on/*in/*of her thoroughness.

b. Her pride in/*on/*of her thoroughness is understandable.

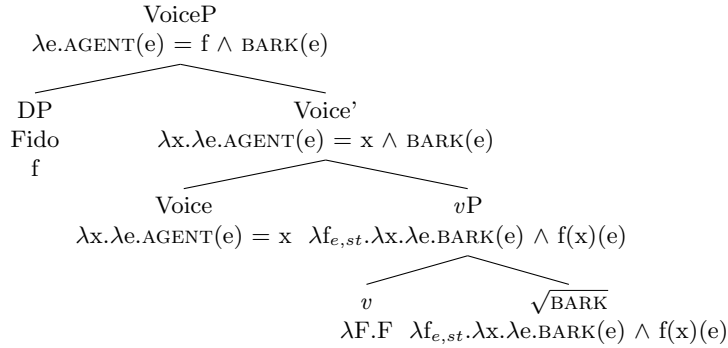c. She is proud of/*on/*in her thoroughness.

Merchant (2019) concludes that the selection of a PP is not encoded in the root but by the categorizing head. In addition, the categorizing head can specify the exact form of the preposition heading the PP it selects. Incorporating this

insight, we can treat v as directly encoding the P that it selects for, while also contributing the GOAL role fulfilled by the DP introduced within the PP. The interpretation of such a v is given below; we assume again along with Merchant (2019) that in addition to specifying the form of the preposition and the thematic role, v heads specifying a PP argument and the form of a preposition also encodes an idiosyncratic list of roots that it can combine with. Under this view, the P head itself is semantically inert, being licensed by a selectional feature of v.

(29) $[\![v_{\text{AT}}]\!] \rightarrow \lambda x. \lambda e. \text{GOAL}(e) = x \: / \: [\: P_{\text{AT}}P \: [\: \underline{\quad} \: \sqrt{\text{BARK}}/\sqrt{\text{YELL}}/ \: ... \:] \:]$

With these assumptions in place, cases where agentless presuppositions are permitted with intransitive roots that take a PP argument will receive the same analysis as those that optionally take a DP complement. For the root $\sqrt{\text{BARK}}$, for example, agentless presuppositions are not permitted in the intransitive variant, because v is interpreted as an identity function, and vP takes the AGENT role contributed by VOICE as an argument. This means that vP is not of the correct semantic type for *again* to take as an argument; only VoiceP is type $<v,t>$, parallel to (25). This is shown in (30) below.

(30) Fido barked.

VoiceP
$\lambda e. \text{AGENT}(e) = f \land \text{BARK}(e)$

DP
Fido
f

Voice'
$\lambda x. \lambda e. \text{AGENT}(e) = x \land \text{BARK}(e)$

Voice
$\lambda x. \lambda e. \text{AGENT}(e) = x$

vP
$\lambda f_{e,st}. \lambda x. \lambda e. \text{BARK}(e) \land f(x)(e)$

v
$\lambda F.F$

$\sqrt{\text{BARK}}$
$\lambda f_{e,st}. \lambda x. \lambda e. \text{BARK}(e) \land f(x)(e)$

When a PP is present, however, v will introduce the GOAL thematic role, saturating the root's thematic role argument, with the individual denoted by the PP saturating the individual argument. This achieves the same effect as in (26): apart from VoiceP, vP will now also be a constituent of type $<v,t>$, making it available for *again* to take as an argument. When attached here, *again* will not include the agent in its presupposition, thus allowing for an agentless presupposition, as (31) shows.

(31) Fido barked at Milo.

13

VoiceP
$\lambda e.\textsc{agent}(e) = f \wedge \textsc{bark}(e) \wedge \textsc{goal}(e) = m$

DP
Fido $\quad\lambda x.\lambda e.\textsc{agent}(e) = x \wedge \textsc{bark}(e) \wedge \textsc{goal}(e) = m$
f

Voice $\qquad\qquad vP$
$\lambda x.\lambda e.\textsc{agent}(e) = x \quad \lambda e.\textsc{bark}(e) \wedge \textsc{goal}(e) = m$

PP $\qquad\qquad v'$
m $\qquad\qquad \lambda x.\lambda e.\textsc{bark}(e) \wedge \textsc{goal}(e) = x$

P $\quad$ DP $\qquad v_{\textsc{AT}} \qquad\qquad \sqrt{\textsc{BARK}}$
at $\quad$ Milo $\quad \lambda x.\lambda e.\textsc{goal}(e) = x \quad \lambda f_{e,st}.\lambda x.\lambda e.\textsc{bark}(e) \wedge f(x)(e)$
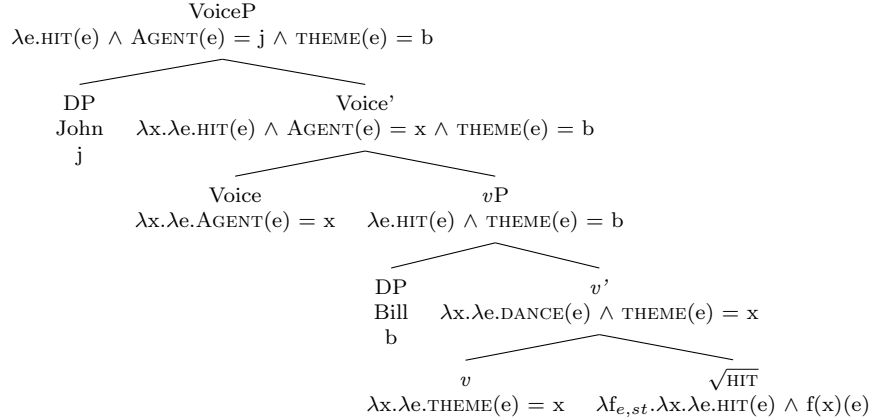$\lambda F.F \quad$ m
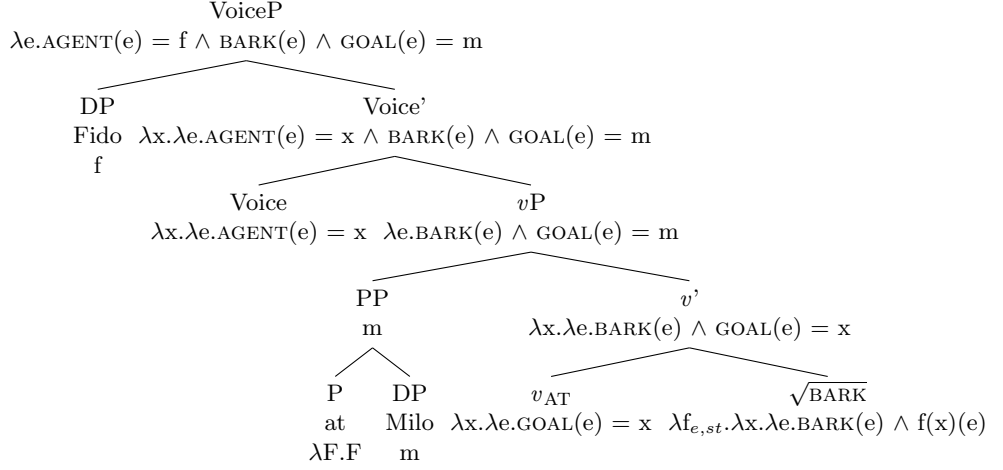
Note that in all of the above cases, we maintain a conservative syntactic analysis of the introduction of the agent: on our analysis, there is no need to distinguish intransitive and transitive verbs with respect to how they compose with their agents, *contra* Bale (2007). Rather, agents are uniformly introduced in the specifier of VoiceP, as in Kratzer (1996). However, departing from Kratzer's analysis, we posit that roots take an underspecified thematic role argument, which may be supplied by Voice or by a lower v. This combination of a conservative syntax and a novel semantics for verb roots allows us to successfully derive the Internal Argument Generalization.

What of agentive transitive verbs that do not readily admit an intransitive variant? Here we can enforce a constraint on the meaning of v such that it is necessarily interpreted as contributing a thematic role in the context of certain roots.

(32) $[\![v]\!] \to \lambda x.\lambda e.\textsc{theme}(e) = x \ / \ [\ \_\_ \ \sqrt{\textsc{HIT}} \ ... \ ]$

This rule is reminiscent of the one in (23a), but differs from it in requiring that v be interpreted as contributing the Theme role regardless of the presence of a DP. As such, an individual argument will be necessary for semantic composition to proceed in the presence of a root like $\sqrt{\textsc{HIT}}$. We can therefore give roots like $\sqrt{\textsc{HIT}}$ denotations analogous to those of the other verbs discussed in this section, with an identical syntactic and compositional semantic analysis.

(33) Strictly transitive verbs

VoiceP
$\lambda e.\textsc{hit}(e) \wedge \textsc{agent}(e) = j \wedge \textsc{theme}(e) = b$

DP
John
j

Voice'
$\lambda x.\lambda e.\textsc{hit}(e) \wedge \textsc{agent}(e) = x \wedge \textsc{theme}(e) = b$

Voice
$\lambda x.\lambda e.\textsc{agent}(e) = x$

vP
$\lambda e.\textsc{hit}(e) \wedge \textsc{theme}(e) = b$

DP
Bill
b

v'
$\lambda x.\lambda e.\textsc{dance}(e) \wedge \textsc{theme}(e) = x$

v
$\lambda x.\lambda e.\textsc{theme}(e) = x$

$\sqrt{\textsc{hit}}$
$\lambda f_{e,st}.\lambda x.\lambda e.\textsc{hit}(e) \wedge f(x)(e)$

This is completely in line with our approach to the INTERNAL ARGUMENT GENERALIZATION, and shows that we manage to account for the facts about strictly transitive verbs just as well as Bale (2007). We thus have a completely unified analysis of agentive verbal roots with underspecified argument structure.

4.3 Against an alternative analysis

It has been suggested that cases of unergative verbs like *dance* taking an optional DP complement can be analyzed as creation verbs and their DP complement corresponds to a created object, as in *build the house* (e.g. Folli and Harley, 2005, c.f. Hale and Keyser, 1993). On this view, informally speaking, *dance the Irish jig* would be interpreted as *there was a dancing event e and e was an event causing there to be an Irish jig.* Cashing this out syntactically would require that there be a small clause constituent that denotes a stative property of existence, or, alternatively, some kind of interpretive rule that maps the DP to a stative predicate semantically (see Marantz 2005, 2007 and Wood and Marantz 2017 for such an analysis of creation and change-of-state verbs). For concreteness, we illustrate a possible structure for a small clause analysis, utilizing a silent event predicate EXISTS to denote the state of existence. This small clause constituent would be of type $<v,t>$, serving as the argument of a causative v, which introduces the CAUSE relation between an event and a state and thus is of type $<<v,t>,<v,t>>$ (Kratzer, 2005). Under this analysis, the fact that an agentless presupposition is allowed when there is an optional object can be attributed to the fact that sentences containing verbs of performance contain as part of their structure a stative constituent that requires a causative v, and that the vP is the correct type for *again* to take as an argument. This position excludes the agent introduced by VOICE and generates a *restitutive* reading presupposing that the Irish jig existed before. On this approach, then, the apparent agentless presupposition is illusory, and has a completely different source from the sorts of presuppositions with which Bale (2007) was originally concerned.

(34)   [AGENT VOICE [CAUSE [$_{SmallClause}$ EXISTS DP]]]

We wish to point out three problems for such an analysis. First, note that it says nothing about the intransitive uses of verb roots like $\sqrt{\text{DANCE}}$ or $\sqrt{\text{BARK}}$ and how they disallow subjectless presuppositions, as originally observed by Bale (2007). One could say that in the intransitive variant where these roots are interpreted as activity verbs, there is simply a different 'flavor' of little v, something like the v_{DO} of Folli and Harley (2005) denoting a doing event. Even so, assuming then that the agent is still introduced by VOICE, one would still predict the intransitive variant to permit an agentless presupposition, contrary to fact.

Second, while verbs of performance like $\sqrt{\text{DANCE}}$ may plausibly be analyzed as creation verbs, this analysis does not extend so easily to the other we've considered cases like $\sqrt{\text{SWEEP}}$ or $\sqrt{\text{BARK}}$, the latter of which takes a PP argument. One might think roots like $\sqrt{\text{BARK}}$ are interpreted on par with motion constructions such that there is a small clause constituent that denotes some kind of state. However, the interpretation of *bark at Fido*, for example, is not *there is a barking event and it is an event causing a bark to be at Fido*, as one would expect if these are semantically on a par with motion verbs like *dance* where *Mary danced into the room* means *there is a dancing event and it was an event whose agent is Mary and caused Mary to be in the room*. Likewise, such analyses would also say nothing about the intransitive use of *bark* disallowing agentless presuppositions, since the agent would presumably still be introduced by VOICE.

Most importantly, though, even if we set aside the first two concerns, we see that a creation verb analysis along the lines of (34) makes incorrect predictions about the range of available readings when transitive uses of *dance* are modified by *again*. Specifically, such an analysis predicts the existence of a purely restitutive reading with *again* when it attaches to the small clause result constituent (von Stechow, 1996; Beck and Johnson, 2004). We see plainly that such a reading with *again* is impossible. It is difficult to construct an example with *dance*, since some form of dance existing is intrinsically caused by some event of dancing, so we elect instead to use the verb *sing*, another verb of performance that permits an optional DP argument in the same way *dance* does. In the context below, because the song *Amazing Grace* was previously performed via humming, a manner different from the asserted event of singing, the repetitive reading of *again* is ruled out. The context thus forces a restitutive reading, in which *again* would target a result state constituent, presumably of the song existing. Crucially, we see that in this context, such a sentence is infelicitous. This indicates that there is in fact no such result state constituent that *again* can target, and the only possible reading is a agentless repetitive reading where the manner of performance of both the asserted and presupposed events is identical.

(35)   CONTEXT: Kristina previously hummed the song Amazing Grace. Lucy really loved the song and wanted to hear it one more time so...

　　　a. **# Peter sang Amazing Grace again.**
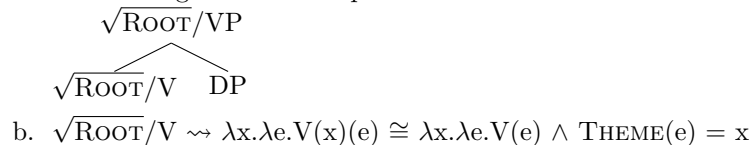
b. **Peter hummed Amazing Grace again.**

In contrast, our own analysis makes no recourse to the presence of a small clause constituent in the transitive variant, and therefore does not make the incorrect prediction that the creation verb analysis makes. The difference between the transitive and intransitive use of such verbs is due to the presence of an optional argument conditioning the interpretation of a verbalizing v. In addition, regardless of whether *again* attaches to VoiceP or vP, the verbal root is always included in *again*'s presupposition, and thus correctly predicts that (35a) is infelicitous in the context given, while (35b) is felicitous. In light of these concerns, we contend that cases where verb roots that can optionally appear in a transitive structure do not involve a small clause result state constituent that can be targeted by *again*-modification.

5   Severing all arguments from the verb

Our derivation of the INTERNAL ARGUMENT GENERALIZATION has led us to an analysis on which arguments and their thematic roles are syntactically and semantically severed from the verb, but verbal roots still take a number of arguments in addition to an event argument. These arguments are a functional argument and an individual argument, which are saturated by a thematic role argument introduced by v and the individual denoted by the DP introduced in the specifier of vP. We also maintain that VOICE introduces the agent argument in all cases, and that the AGENT role may saturate the root's functional argument or associate with the denotation of the vP via EVENT IDENTIFICATION, depending on whether the root's thematic role argument has been saturated by another role or not.

Having developed an account of how agents *qua* external arguments relate to the vP, we are now in a position to situate our proposal in the theoretical context of the relation between *internal* arguments and the verb/root. There are two general poles involved in this debate. On one side are those who argue that internal arguments are syntactic complements to the verb/root. with the verb/root directly composing with the internal argument via function application (Marantz, 1984; Kratzer, 1996; Bale, 2007; Pylkkänen, 2008; Harley, 2014, a.o.). (36) displays this analysis.[4]

(36)   a. Internal argument as complement to verb

$\sqrt{\text{ROOT}}$/VP

$\sqrt{\text{ROOT}}$/V   DP

b. $\sqrt{\text{ROOT}}$/V $\leadsto \lambda x.\lambda e.V(x)(e) \cong \lambda x.\lambda e.V(e) \wedge \text{THEME}(e) = x$

---

[4]Not all of these authors adopt a Distributed Morphology-based perspective, so in our representations illustrating the issue at hand we aim for neutrality by writing $\sqrt{\text{ROOT}}$/V for the object corresponding to the idiosyncratic verbal element at the base of the tree.

On the other side of the debate, it is argued that roots/verbs do not take complements; instead, the internal argument, much like the external argument, is syntactically severed from it, and is introduced as the specifier of a functional projection that dominates the $\sqrt{\text{Root}}$/VP, as in (37) (Schein, 1993; Borer, 2003, 2005; Ramchand, 2008; Champollion, 2010; Ahn, 2020, a.o.).

(37)   Internal arguments introduced by functional heads

```
                    FP
                  /    \
               DP       F'
                       /  \
                      F    √Root/VP
                            |
                          √Root/V
```

Syntactically, the approach we advocate in this paper is clearly an instance of the latter type of proposal: the root takes no complement, and the internal argument is introduced by a functional projection (here vP). This is certainly necessary for the analysis of the transitivity alternations this paper is primarily concerned with, as non-agent roles must be introduced separately from the verb in order to account for the differential availability of agentless presuppositions depending on the presence of an internal argument. With respect to the semantics, however, our proposal is to some degree reminiscent of Kratzer's, which also posits that verbs take arguments beyond the event variable. Our analysis diverges from this by adding a thematic role argument to the verb, thereby allowing the thematic role of the verb's individual argument to vary depending on the structure in which the verb is embedded, rather than fixed to a role like Theme.

Not all analyses that sever the internal argument from the verb syntactically make specific claims about the semantics of roots: for instance, Borer (2005) holds that roots are devoid of inherent semantic content, and only receive particular interpretations at the semantic interface given their syntactic context. This kind of proposal is thus compatible with our analysis, whereby roots can be assigned interpretations as functions of type $<<e,<v,t>>,<e,<v,t>>>$. Other proposals in this vein, however, are more specific in their semantics, and explicitly propose that verbs/roots be treated as bare predicates of events, with all individual arguments related to the verb via thematic roles introduced by functional projections. Analyses in this vein include Schein (1993), Champollion (2010), Lohndal (2012), and Ahn (2020).

(38)   Verbs/roots as predicates of events
       $\sqrt{\text{Root}}$/V $\rightsquigarrow \lambda e.V(e)$

A recent argument for this view comes from Ahn (2020), who uses *out*-prefixation to advocate for severing all arguments from the verb/root, which we discuss in the following subsection, with a view toward applying our own proposal to the phenomena.

5.1 *Out*-prefixation as an argument for severing of the internal argument

Out-prefixation creates a transitive structure, denoting a situation in which the subject and object participate in the same kind of event and the subject performs their event to a greater/better degree than the object did (Ahn, 2020, pp. 7). *Out-* does not impose any particular semantic role on the subject and object so long as the thematic roles they bear to their respective events are identical, as Ahn (2020, pp. 8) shows using the following naturally occurring examples.

(39) a. Gorbachev is outmaneuvering his critics.   (Agents)
      b. This hard stone outsparkles even more costly precious gems ... (Themes)
      c. Students [doing X] outrecalled students [doing Y].   (Experiencers)

Out- also does not seem to require the subject and object to be thematically related to the event denoted by PRED. This suggests that the arguments of *out*-PRED are really arguments of *out-* rather than arguments of PRED, as shown below where the subject and object cannot bear any thematic relation to PRED in the absence of *out-*. Additionally, *out-* also behaves like a verbalizer, with the input to *out*-prefixation being any lexical category but the output always being verbal (Ahn, 2020, pp. 9).

(40) Verbal stem
      a. Atlanta out-rained Seattle in 1922 and 1923.
      b. *Atlanta rained,
      c. *It rained Atlanta.

(41) Adjectival stem
      a. We out-smarted them.
      b. *We smarted.
      c. *We smarted them/ourselves/...

(42) Nominal stem
      a. She out-Einstein'd Einstein.
      b. ?She Einstein'd.
      c. *She Einstein'd him/herself/...

Finally, and most importantly for our purposes, *out-* appears to impose its own argument structure, building on top of or seemingly suppressing PRED's. First, *out-* can be built on top of intransitive PREDs, always producing a transitive structure whether PRED is unaccusative or unergative (Ahn, 2020, pp. 11).

(43) Unaccusative
      a. The fidget spinner will spin when you click on it.

b. ... the r188 bearing spinner will out-spin the 608 spinner.

(44) Unergative
  a. The students will think (about syntax).
  b. The students will out-think the teachers.

With transitive stems that typically occur with objects, *out-* never allows for their objects to occur in *out*-PRED, with the surface subject and object always being introduced by *out-*. In other words, *out-* seems to suppress the original objects of its stems and these objects can only be expressed periphrastically (Ahn, 2020, pp. 13).

(45) My friend and I were in staring contests against her mother. I stared at her mother, and then she stared at her mother.
  a. She out-stared me.
  b. She out-stared (*at her mother) me (*at her mother).
  c. She out-stared me, in a contest to stare at her mother.

(46) He spent his inheritance.
  a. He out-spent his siblings.
  b. He out-spent (*his inheritance) his siblings (*his inheritance).
  c. He outspent his siblings, using his inheritance.

It is the particular fact of apparent argument suppression of a transitive stem that prompts Ahn (2020) to consider the semantics of verbs/roots, given that he also employs a realizational framework of word-formation. In particular, assuming the MONOTONOCITY HYPOTHESIS (Koontz-Garboden, 2007, a.o.), suppressing an argument introduced by PRED should never be allowed, since it would involve removing a thematic role that PRED lexically introduces.

(47) MONOTONOCITY HYPOTHESIS: Word formation operations do not remove operators from lexical semantic representations.

Assuming the MONOTONOCITY HYPOTHESIS, this leads to the conclusion that *out-* can never suppress a semantic role introduced by PRED. In turn, it should be the case that PRED never introduces an argument. Thus, Ahn (2020) argues that *out*-prefixation provides empirical arguments that internal arguments should be severed both syntactically and semantically from the verb/root just as external arguments are (e.g. Schein, 1993; Kratzer, 1996; Champollion, 2010). Internal arguments are introduced by functional heads within the verbal spine, and *out-* serves to introduce comparative semantics and its own argument structure to the PRED it combines with, enforcing that its first individual argument is lower than its second individual argument on some contextually determined scale with respect to the event *out-* combines with as its first argument (Ahn, 2020, pp. 19-20).
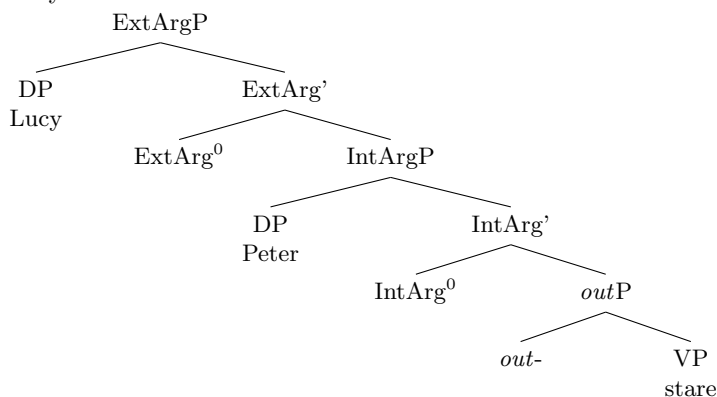
(48) a. Lucy stared at Peter.

ExtArgP
- DP: Lucy
- ExtArg'
  - ExtArg^0
  - IntArgP
    - PP: at Peter
    - IntArg'
      - IntArg^0
      - VP: stare
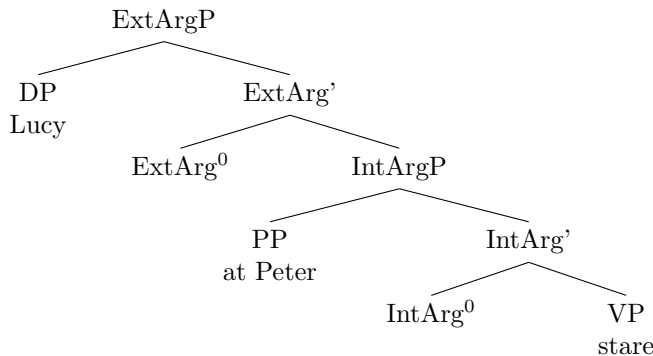
b. stare $\rightsquigarrow$ λe.STARE(e)

c. ExtArgP $\rightsquigarrow$ λe.STARE(e) $\wedge$ AGENT(e) = l $\wedge$ THEME(e) = p

(49) a. Lucy out-stared Peter.

ExtArgP
- DP: Lucy
- ExtArg'
  - ExtArg^0
  - IntArgP
    - DP: Peter
    - IntArg'
      - IntArg^0
      - *out*P
        - *out-*
        - VP: stare

b. *out-* $\rightsquigarrow$ λP.λx.λy.λe. y $>^c$ x w.r.t P-type events/states[5]

c. ExtArgP $\rightsquigarrow$ λe. l $>^c$ p w.r.t STARE(e)

5.2 Unattested repetitive presuppositions with argument-less verbs

A general problem for approaches on which verbs denote predicates of events with all arguments introduced by functional heads comes from their interaction with *again*: because the verb is itself type $<v,t>$, such analyses predict the possibility of presupposing that there was simply *some event of the same kind before, with no reference to the arguments of the verb*. Such presuppositions are unattested, however, as the following contexts demonstrate:

(50) CONTEXT: John hit Bill. Then, #**Mary hit Steven again.**

---

[5]We add an event variable to Ahn's denotation for *out-*, which is necessary for composition with thematic roles and with *again*.

On Ahn's analysis of *out*-prefixation, these problems multiply. Claiming that the internal argument of PRED should be severed from the verb/root in order to maintain the MONOTONOCITY HYPOTHESIS predicts that the verb/root, being a predicate of events of type $<v,t>$ like that in (49), should be available for *again* to attach (e.g. Pylkkänen, 2008; Beavers and Koontz-Garboden, 2020). This produces a presupposition where there was a previous event which crucially *need not* be an *out*-PRED event, but may simply be a PRED event. This is shown in the logical representation of *again*'s presupposition, assuming that it attaches directly to the verb/root *stare* in (49).

(51) Lucy out-stared Peter again.
      PRESUPPOSITION: $\exists e^1 \exists e^2 [e^1 \prec e^2 \prec e$ & STARE(e^1) & ¬STARE$(e^2)]$

Such a presupposition though is plainly never available. This is illustrated with the following contexts. When the context provides a previous *out-staring* event in (52), *again*'s presupposition is satisfied. If, on the other hand, the previous event is a simple staring event that does not involve a comparison between two staring events in (53), *again*'s presupposition is not satisfied. In particular, (53) shows that this contrast cannot be reduced to claiming that an out-staring event entails a staring event, satisfying the presupposition in (51), as might be the case in (52). If so, a previous staring event should also satisfy the presupposition in (51); the fact that it does not in (53) suggests that the presupposition in (51) is actually never available and not the correct presupposition produced.

(52) CONTEXT: Lucy challenged Peter to a contest of staring at her mother. Lucy stared at her mother and Peter stared at her mother. Lucy stared longer at her mother than Peter and hence Lucy out-stared Peter. Peter, not satisfied with losing the contest, challenged Lucy to another staring contest the next day. This time, Lucy stared at her mother longer than Peter so...
      Lucy out-stared Peter again.

(53) CONTEXT: Lucy stared at her mother for a long time. The next day, Peter challenged Lucy to a contest of staring at her mother. Lucy stared at her mother longer than Peter so...
      #Lucy out-stared Peter again.

There is therefore an analytical tension between maintaining the MONO-TONICITY HYPOTHESIS, reconciling the facts of *out*-prefixation as described by Ahn (2020), as well as the kinds of repetitive presuppositions produced when *again* is attached to *out*-PRED. We demonstrate in the next section that our proposal for the semantics of roots, combined with an appropriate semantics for *out*-, derives the observations with *out*-prefixtion straightforwardly.
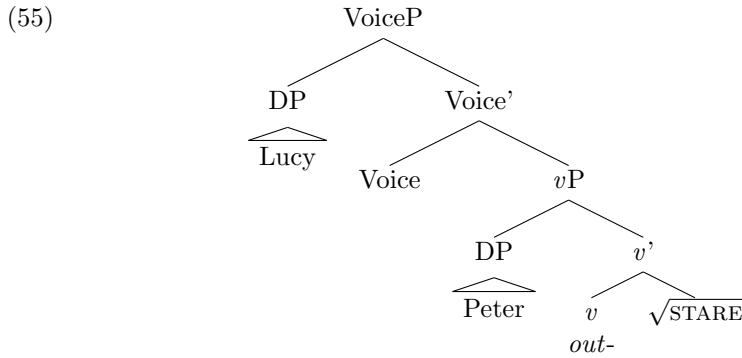
5.3 Monotonocity and how to *out*-PRED again

We demonstrate here that our proposal for roots developed in section 4 may be extended to the case of *out*-prefixation, capturing Ahn's insights while avoid-

ing the pitfalls of his analysis. First, recall that the denotation of a root like $\sqrt{\text{DANCE}}$ or $\sqrt{\text{STARE}}$ will be treated as a function taking a thematic role function, individual, and event argument.

(54) $\sqrt{\text{STARE}} \rightsquigarrow \lambda f_{e,vt}.\lambda x.\lambda e.\text{STARE}(e) \wedge f(x)(e)$

Second, we propose that *out-*, given its verbalizing property, is a *v* head that has an internal argument in its specifier and acts as complement to VOICE. This assimilates the syntactic structure of *out-* prefixation to the other cases we considered in this paper.

(55)

```
                    VoiceP
                   /      \
                 DP       Voice'
                 /\       /     \
               Lucy   Voice      vP
                             /        \
                           DP          v'
                           /\         /    \
                        Peter       v    √STARE
                                   out-
```

Finally, we need an explicit semantics for *out-* that meshes appropriately with the structure in (55). We propose the following in (56).

(56) *out-* $\rightsquigarrow \lambda F_{<<e,vt>,<e,vt>>}.\lambda y.\lambda f.\lambda x.\lambda e.F(f)(x)(e) \wedge \exists e'[F(f)(y)(e') \wedge \mu(e) > \mu(e')]$

Let's break this down. On this proposal, *out-* takes a root denotation (the function F of type $<<e,<v,t>>,<e,<v,t>>>$) as its first argument, which supplies the type of events being carried out by the subject and object. Its second argument, of type *e*, corresponds to the object. It then takes a thematic role argument, which supplies the thematic role that individuals denoted by the subject and object DPs in the sentence bear with respect to their events. This captures the fact that the arguments of *out-*PRED must bear the same thematic role with respect to the events involved: for an example like in (55), both arguments would bear the AGENT role. *out-* then places conditions on two separate events of the same kind, one for each of its individual arguments, and requires that the contextually supplied measure of one event is greater than that of the other. This is represented by the function μ, which is a function that takes an event as an argument and returns the degree on the contextually specified scale on which the event can be measured. This formalizes the idea that *out-* introduces comparative semantics, comparing two events that each have their own distinct participants represented by the surface subject and object of *out-*PRED.

The proposed analysis immediately makes several desirable predictions. First, note that the unattested presuppositions predicted under Ahn's account in (52)

23

and (53) do not surface, as there is simply no constituent of type $<v,t>$ excluding both the internal and external arguments that *again* can attach to in an *out*-PRED struture. Second, we predict that *again* should readily produce repetitive presuppositions with *out*-PRED, regardless of whether the stem was originally intransitive or transitive. These are produced when *again* attaches to VoiceP. Crucially, attaching to VoiceP always includes the semantics of *out*- within *again*'s presupposition, predicting that *only a prior out-PRED event involving the same event participants* can satisfy *again*'s repetitive presupposition. This is borne out, as shown in (57) and (58) involving both an intransitive and transitive stem.

(57) Intransitive stem
      CONTEXT: Kristina challenged Amber to a running contest. They both
      ran for 2 miles and Kristina finished 2 miles faster than Amber. After
      a week, Amber was ready to have another contest with Kristina and
      she challenged Kristina to another 2-mile race. Kristina finished 2 miles
      faster than Amber this time round as well so...
      Kristina out-ran Amber again.

(58) Transitive stem
      CONTEXT: Lucy challenged Peter to a cooking contest. Lucy made fish
      tacos while Peter made kimchi stew. They asked Shin and Kristina
      to decide whose dish tastes better, and both agreed that Lucy's dish
      tastes better. Peter, not satisfied with his first dish, challenged Lucy to
      another cooking contest the next day. This time, Lucy made vegetarian
      chili and Peter made Korean fried chicken. Shin and Kristina agreed
      this time that Lucy's dish still tastes better so...
      Lucy out-cooked Peter again.

What's more, we predict that *out*-PRED structures should disallow agentless presuppositions. This is because the structure with *out*- contains only one constituent of type $<v,t>$, namely VoiceP; all other constituents below VoiceP are of the wrong type for *again* modification. This prediction is borne out: switching out the agent and having a different agent in a prior *out*-PRED event fails to satisfy *again*'s presupposition, as shown below in (59) and (60). Again, this holds regardless of whether the stem to which *out*- attaches is intransitive or transitive.

(59) CONTEXT: Kristina challenged Amber to a running contest. They both
      ran for 2 miles and Kristina finished 2 miles faster than Amber. After
      a week, Amber was ready to have another contest and she challenged
      Shin to another 2-mile race. Shin finished 2 miles faster than Amber
      this time round as well so...
      #Shin out-ran Amber again.

(60) CONTEXT: Lucy challenged Peter to a cooking contest. Lucy made fish
      tacos while Peter made kimchi stew. They asked Shin and Kristina to

decide whose dish tastes better, and both agreed that Lucy's dish tastes better. Peter, not satisfied with losing the contest, challenged Kristina to another cooking contest the next day. Kristina made butter chicken and Peter made Korean fried chicken. This time round, Shin and Lucy were asked to judge and both agreed that Kristina's dish tastes better so...

#Kristina out-cooked Peter again.

This is straightforwardly predicted by our analysis. Given our proposed semantics of *out-*, vP, which is where *again* should attach to produce agentless presuppositions, is of type $<<e,<v,t>>,<e,<v,t>>>$, an incorrect type to serve as *again*'s first argument, on a par with the transitive use of typically intransitive verb roots as discussed in the earlier part of this paper. *Again* therefore can only ever attach to VoiceP in an *out*-PRED structure, predicting that only contexts that contain an identical *out*-PRED event and identical event participants can satisfy the repetitive presupposition produced.

In light of these facts, we contend that the overall proposal here, combined with our semantics for *out-*, predicts the facts observed when *again* attaches to *out*-PRED. Therefore, the evidence from *out*-PRED, though perhaps an argument for syntactic severing of internal arguments from the verb, is not only just as compatible with the analysis of root denotations we have developed in this paper, but our own proposals make superior predictions to analyses that hold that verbs/roots denote predicates of events with no other arguments. Importantly, we also maintain the MONOTONOCITY HYPOTHESIS, in that since roots/verbs contain underspecified functional argument positions, at no point in the derivation is *out-* or any other transitivity alternation removing any lexical-semantic information. Rather, the verbal spine provides the thematic information for the root/verb's arguments, and embedding in different structures results in different thematic interpretations and argument structures.

6 Conclusion

This paper began by challenging Bale's (2007) claim that agentive intransitive verbs differ from transitive verbs in disallowing agentless presuppositions with *again*, demonstrating that typically intransitive verbs do permit agentless presuppositions in the presence of an optional internal argument. We proposed the INTERNAL ARGUMENT GENERALIZATION, according to which agents may only be excluded from the presupposition of *again* if an internal argument is also present. We proposed to derive the INTERNAL ARGUMENT GENERALIZATION from an interaction of syntactic structure and the semantics of verbal roots: verbal roots denote functions taking thematic roles as arguments, in addition to an individual and event argument. In the presence of a thematic role contributed by v, the root's thematic role and individual argument are saturated, permitting an agentless presupposition by producing a constituent of the appropriate type to be modified by *again*. In the absence of such a thematic role, the root

takes VOICE's AGENT role as an argument, thereby excluding agentless presuppositions. We then situated our novel approach to verbal roots in the context of a larger theoretical debate about the syntactic and semantic properties of roots, and further showed that our analysis is compatible with an analysis of *out*-prefixation, which has been used as an argument for syntactic and semantic severing of the internal argument (Ahn, 2020).

In concluding this paper, we would like to discuss a few areas for future research. For one, we note that while the research reported here focuses on the structure of English verbal predicates, our ultimate goal is directed toward an understanding of roots and the syntactic decomposition of argument structure cross-linguistically. To our knowledge, agentless presuppositions with *again* and their implications for the syntax have not been widely explored in a variety of languages. Our hope is that applying agentless presuppositions as a diagnostic cross-linguistically will reveal universals in the semantics of verbal roots and the syntactic decomposition of argument structure, and provide a window into the range of permissible variation in these areas.

Other areas of future investigation include the representation of thematic roles other than agents. Consider once more our INTERNAL ARGUMENT GENERALIZATION, restated below.

(61) INTERNAL ARGUMENT GENERALIZATION
      Presuppositions with *again* that exclude the agent are only possible when an internal argument is present.

Notice that this formalization of the generalization accords special status to agents, rather than just any transitive subject; it seems that agents alone may escape the presupposition of *again*, hence our use of the term *agentless presupposition* throughout this paper rather than Bale's (2007) term *subjectless presupposition*. Bale himself noticed that the experiencer argument of transitive stative predicates like *love* may not lie outside of the presupposition of *again*, as shown in (2) in section 2, repeated below in (6).

(62) CONTEXT: Seymour's mother loved Frank, although she was the only one who did. After a while she no longer cared for him. However, Seymour became attached to the man, and developed strong feelings for him after his mother's love subsided. So...
      a. # **Seymour loved Frank again.**

To this, we can add certain eventive transitive verbs, particularly verbs like *win*, *lose*, and *ace (the test)*, which also do not allow their subject arguments to be excluded from the presupposition of *again*.[6]

(63) John won the Boston Marathon. The following year...
      John/#Mary won it again.

---

[6]We thank Noam Chomsky (personal communication) for bringing these cases to our attention.

We believe it reasonable to propose that the subject of verbs like *win* is not an agent, but a theme or undergoer. This is supported by the fact that one need not necessarily do anything to win or lose a contest, and the fact that even inanimate objects may win or lose contests without any action on their part. One possible explanation for this, then, is that non-agentive verbs take all of their arguments directly, as proposed by Bale (2007) for stative transitives. While treating such verbs as lexically encoding all of their arguments would capture their incompatibility with subjectless presuppositions, it would be interesting to explore a deeper reason for this restriction.

While it does appear to be true that non-agents may not be excluded from the presupposition of *again*, it does not seem to be the case that all agentive verbs are compatible with agentless presuppositions. Bale (2007) provides several examples illustrating this, using the verbs *read*, *look at*, and *think (about)*.

(64)   CONTEXT: Fred read the article about how to be successful in business. After he was finished, he suggested to Seymour that he might be interested in it. So #**Seymour read the article again**.

Bale notes that these verbs all involve mental activities, but dismisses this as an explanation for their incompatibility with agentless presuppositions, for other similar verbs involving mental activity are acceptable with such presuppositions. Verbs of this sort include *proofread*, *analyze*, and *critique*.

(65)   Fred maintains the highest level of quality in his writing. For example, he hired a proofreader to proofread his paper. She did the work and found no errors. Although Fred trusted that she did a good job, he still felt more needed to be done. So **he proofread the paper again**.

Despite these apparent counterexamples, we note that the connection to mental activity may have some promise. First of all, it is not clear that the verbs Bale provides as counterexamples are necessarily problematic: for instance, proofreading and analysis can be done by unthinking machines, and one might argue that critique constitutes an action rather than strictly mental activity. Thinking and reading, on the other hand, require conscious thought and intent. Second, intentionality has been noted to have an effect on the availability of agentless presuppositions. In this vein, Ausensi et al. (2020) argue that verbs of killing that encode intentionality, like *murder* and *assassinate*, resist agentless presuppositions, unlike verbs like *kill*, which do not possess an intentionality requirement and are compatible with agentless presuppositions.

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

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

(68)   CONTEXT: Bob, a major political figure, was assassinated by Bill. For-
        tunately, a skilled sorceror was able to bring Bob back to life. However,
        Lucy, an associate of Bill's, appeared and...
        # Lucy assassinated Bob again

It may be the case, then, that while agents are typically severed from the
verb, certain verbs must compose with their agents directly in order to make
reference to the agent's intentions. This would then lead to a more fine-grained
treatment of roots: those that make no necessary reference to the intentions of
their agent receive the analysis provided in section 4, while those requiring access
to the agent's intentions receive a different analysis. We leave the exploration of
this issue, including the pursuit of alternative analyses that do not posit different
kinds of denotations for the different classes of roots, to future research.

Conflict of interest

The authors declare that they have no conflict of interest.

References

Ahn, B. (2020).   Out-PRED: Generalizations and derivation.   Submitted
    manuscript, Princeton University.

Ausensi, J., Yu, J., and Smith, R. W. (2020). Repetitive presuppositions with
    again: Un-severing the external argument. *Proceedings of the Linguistic So-
    ciety of America*, 5(1):83–93.

Bale, A. (2007). Quantifiers and verb phrases: An exploration of propositional
    complexity. *Natural Language & Linguistic Theory*, 25:447–483.

Beavers, J. and Koontz-Garboden, A. (2020).   *The Roots of Verbal Meaning.*
    Oxford University Press, Oxford.

Beck, S. and Johnson, K. (2004).   Double objects again.   *Linguistic Inquiry*,
    35(1):97–123.

Borer, H. (2003). Exo-skeletal vs. endo-skeletal explanations: Syntactic projec-
    tions and the lexicon. In Moore, J. and Polinsky, M., editors, *Explanation in
    linguistic theory*, pages 31–67. CSLI, Standford.

Borer, H. (2005). *Structuring Sense: In Name Only*, volume 1. Oxford Univer-
    sity Press, Oxford.

Carlson, G. (1998). Thematic roles and the individuation of events. In Rothstein,
    S., editor, *Events and grammar*, pages 35–51. Dordrecht: Kluwer.

Castañeda, H.-N. (1967). Comments. In Rescher, N., editor, *The logic of deci-
    sion and action*, pages 104–112. Pittsburgh: University of Pittsburgh Press.

Champollion, L. (2010). *Parts of a whole: Distributivity as a bridge between aspect and measurement*. PhD thesis, University of Pennsylvania.

Davidson, D. (1967). The logical form of action sentences. In Rescher, N., editor, *The logic of decision and action*, pages 81–94. Pittsburgh: University of Pittsburgh Press.

Dowty, D. (1979). *Word meaning and Montague grammar*. Dordrecht: D. Reidel Publishing.

Folli, R. and Harley, H. (2005). Flavors of *v*. In Kempchinsky, P. M. and Slabakova, R., editors, *Aspectual inquiries*, pages 99–120. Dordrecht: Springer.

Hale, K. and Keyser, S. J. (1993). On argument structure and the lexical expression of syntactic relations. In Samuel, J. K. and Hale, K., editors, *The View from Building 20: Essays in Linguistics in Honor of Sylvain Bromberger*, pages 53–109. MIT Press, Cambridge.

Halle, M. and Marantz, A. (1993). Distributed Morphology and the pieces of inflection. In Hale, K. and Keyser, S. J., editors, *The View from Building 20: Essays in honor of Sylvain Bromberger*, pages 111–176. Cambridege, MA: MIT Press.

Harley, H. (2013). External arguments and the Mirror Principle: on the distinctness of voice and v. *Lingua*, 125(34-57).

Harley, H. (2014). On the identity of roots. *Theoretical Linguistics*, 40(3/4):225–276.

Harley, H. and Stone, M. S. (2013). The 'No Agent Idioms' hypothesis. In Folli, R., Sevdali, C., and Truswell, R., editors, *Syntax and its limits*, pages 251–273. Oxford: Oxford University Press.

Horvath, J. and Siloni, T. (2003). Against the little-v hypothesis. In Falk, Y. N., editor, *Proceedings of the Israeli Association for Theoretical Linguistics 19*, Israel. Ben Gurion University of the Neg.

Koontz-Garboden, A. (2007). *States, changes of state, and the Monotonicity Hypothesis*. PhD thesis, Stanford University.

Kratzer, A. (1996). Severing the external argument from its verbs. In Ann Zaring, L. and Rooryck, J., editors, *Phrase structure and the lexicon*, pages 109–137. Kluwer, Dordrecht.

Kratzer, A. (2005). Building resultatives. In Maienborn, C. and Wöllstein, A., editors, *Event arguments: Foundations and applications*, pages 177–212. Tübingen: Niemayer.

Landman, F. (2000). *Events and plurality*. Dordrecht: Kluwer.

Levin, B. (1993). *English verb classes and alternations: A preliminary investigation.* Chicago: University of Chicago Press.

Lohndal, T. (2012). *Without specifiers: Phrase structure and events.* PhD thesis, University of Maryland, College Park.

Marantz, A. (1984). *On the nature of grammatical relations.* Cambridge, MA: MIT Press.

Marantz, A. (2005). Objects out of the lexicon: Objects as events. Talk given at the University of Vienna.

Marantz, A. (2007). Restitutive *re-*, and the first phase syntax/semantics of the VP. Talk given at the University of Maryland.

Merchant, J. (2019). Roots don't select, categorial heads do: Lexical selection of PPs may vary by category. *The Linguistic Review*, 36(3):325–341.

Pylkkänen, L. (2008). *Introducing arguments.* Cambridge, MA: MIT Press.

Ramchand, G. (2008). *Verb meaning and the lexicon: A first phase syntax.* Cambridge: Cambridge University Press.

Rappaport-Hovav, M. and Levin, B. (2010). Reflections on manner/result complementarity. In Rappaport Hovav, M., Doron, E., and Sichel, I., editors, *Syntax, lexical semantics, and event structure*, pages 21–38. Oxford University Press.

Schein, B. (1993). *Plurals and events.* Cambridge, MA: MIT Press.

von Stechow, A. (1996). The different readings of wieder 'again': A structural account. *Journal of Semantics*, 13(2):87–138.

Wechsler, S. (2005). What is right and wrong about little *v*. In Dimitrova-Vulchanova, M. and Åfarli, T. A., editors, *Grammar and beyond—Essays in honour of Lars Hellan*, pages 179–195. Oslo: Novus Press.

Wood, J. and Marantz, A. (2017). The interpretation of external arguments. In D'Alessandro, R., Franco, I., and Ángel J. Gallego, editors, *The verbal domain*, pages 255–278. Oxford: Oxford University Press.