REPETITIVE AND RESTITUTIVE PRESUPPOSITIONS AND THE SEMANTICS OF ENGLISH VERBAL ROOTS

by

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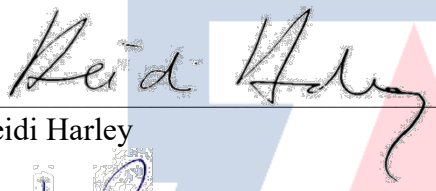

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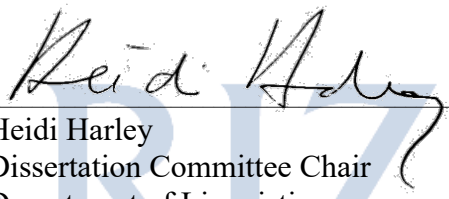

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This dissertation bears my name as author, but anyone who has ever undertaken the task of writing a doctoral dissertation knows that it takes a village to write one that is of any empirical and theoretical significance. I would hence like to express my gratitude to all who made it possible to get here, not just in terms of finishing this dissertation, but also making me the linguist and person I currently am.

First and most naturally, I thank my dissertation committee: Heidi Harley, Robert Henderson, and Simin Karimi. Heidi's work has always been and is still a major inspiration. One only needs to look at the wide range of her work cited here; no less than 15 of some of her most influential papers are in my reference section last I counted, the most of any author, and still that represents only a small part of her wide-ranging interests. I would be remiss, however, to only mention the intellectual prowess and not her overall qualities. Yosuke Sato, a former Heidi advisee and early mentor, once told me about the number of times he had broken down over the pressures of graduate school and cried in Heidi's office. I did not really understand why back then, but I do now, having cried multiple times in her office myself. The process of pursuing linguistics has thrown me many a curveball and Heidi has been there for all of them, providing a listening ear and giving practical advice, always with tons of empathy and compassion. The combination of brilliant intellectual and linguistic insight (the significance of which I often only understand months later), genuine care and concern for her students' well-being, and being an ardent supporter of all of her students' work makes Heidi one of the most special linguists I know.

Robert taught me semantics from the ground up, from propositional logic to predicate logic to first order logic to lambda calculus and to dynamic semantics (which I have yet to fully grasp), and this dissertation would not look the way it does if he had not inspired an interest in formal semantics and a compositional syntax-semantics interface. Robert also constantly looks out for graduate students; I have lost count of the number of times I would run into him outside the department building and we would chat on the way to the coffee shop, where he would always assume he was paying for my coffee and insist on doing so despite my offers to pick up my own. I will continue to aspire to be the formal semanticist that he is and also, to be able to make that mean spicy Szechuan hotpot broth he cooked up that one evening when he hosted us for an informal get-together.

Throughout the dissertating process, Simin always reminded me of the potential cross-linguistic projects that could extend from the ideas here and it is most unfortunate that I cannot embark on investigating some of these suggestions in

other languages. She remains one of the most passionate and dedicated linguists I know, most evidently so in investigating her native language Persian and related languages in the same family. In what seems to be a recurrent theme, I have never paid for a meal with Simin as well, whether it is brunch at Blue Willow, those wonderful meals at the Persian Room, or coffee and pastries at the coffee shop on University Boulevard that one morning when we chatted about life and how I was slowly emerging from a dark place emotionally at that point. I think I would have made it in life if I can remain as passionate, energetic, dedicated, and generous as Simin is about her work, her language, her students, and her family when I reach her age.

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Many other faculty members here at Arizona's department of linguistics have shaped me as a person outside of my immediate research interests, whether through their classes or through working with them in various capacities. Diane Ohala and Amy Fountain taught me how to teach and how to treat students with dignity, respect, and empathy. Andrew Carnie taught many of the syntax classes I was required to take, has some of the best gossip in linguistics that I have ever heard, and also showed me how to effectively teach generative grammar and syntax to an audience of students with no prior background. Of course, he also looks out from his office in Administration over the welfare and development of all graduate students in his capacity as Dean of Graduate College. Mike Hammond, despite all the friendly jibes about me as 'the syntax guy' and about him and his age, taught me basic programming skills and their utility, though I maintain he never managed to convince me on taking up phonology as a research interest, and certainly not weighted Optimality Theory. Massimo Piatelli-Palmarini has always showed an interest in the work that I do, whether through coming to SynSalon presentations or in personal conversations, and his story about how one conference dinner he attended recreating ancient Mediterranean food turned out to be the worst meal of his life remains one of the best personal stories I have heard in my time here. Tom Bever always believed in me as a teacher, constantly tried to get me teaching opportunities for his classes,

and also showed an interest in my work whenever we had the chance to talk about it. I met Diana Archangeli quite late on in my time here after she returned from Hong Kong, but we immediately found common ground in areas such as non-academic careers and addressing the concerns of international graduate students within the department when she assumed her role as Director of Graduate Studies. Natasha Warner, as department head, always reached out to me through social media when it was abundantly clear to everyone looking that I was in a dark place emotionally and mentally. Muriel Fisher always had the brightest and kindest smile for me as an office neighbor, and became an avid follower when cooking and taking pictures of what I cooked became a source of relief during these long months of self-isolation in this ongoing pandemic. The same can be said of Arizona alumna Colleen Fitzgerald, who became quite the cheerleader in my cooking adventures, and whom I will no doubt acknowledge as being the first to suggest it to me if I ever become a YouTuber running a cooking channel. Many other faculty members made a difference in my time here, whether through classes, working together on various projects, or simply through conversations we had. I am grateful for all of these interactions, and regret that I am unable to name all of them and describe every single experience here.

Outside of faculty, our department would not function administratively without our administrative staff Stephanie Amado, Marian Wiseley, and Kimberley Young, who made sure that we never have to worry about receiving our paychecks, got our paperwork in order whenever we had to travel for official purposes, and helped navigate all the confusing paperwork on GradPath that a graduate student goes through. I am thankful for all the help and support they have provided in my time here.

Many fellow graduate students and peers at Arizona, both within and outside the department, have made graduate student life more bearable. Ours is a special department, where cohort and disciplinary boundaries disappear (or get made fun of, all in good fun) when it is time for Happy Hour, trivia, drinks, karaoke, department events, dinner parties etc. There are many good memories of going to Gentle Ben's, The Public, and of course, getting a JR special from The Independent and a Sonoran hotdog late in the evening from that one food truck outside The Hut. There have been many difficult times for me personally as well, and many of them were there for me during those dark moments, whether through conversations, having a coffee, or just hanging out. For these and many other memories, I thank Ryan Walter Smith, Kristina Mihajlovic, Lucy Hall-Hartley, Amber Lubera, Andrew Zupon, Masha Alexeeva, Shin-ichi Kitada, Adam King, George-Michael Pescaru, Shannon and Karissa Grippando, Priscilla and David Shin, Seongjin Park, Juli Kim, Rana Nabors, Colleen Patton, Stanley Donahoo, Leah Rice, Bill Cotter, Bri Alexander, Joe Dupris, Kevan Joe, Yiyun Zhao, Meg Harvey, Kerry McCullough, John Powell, Remo Nitschke, Luis Irizarry, Jesús Gonzalez, Megh Krishnaswamy, Max Mulé, Frances Lee-Forbes, and many, many

others that will take more than a page to name.

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One of the magical things of graduate school is the opportunity to get to know researchers and peers in the field outside one's immediate department through attending conferences and institutes, and I had the privilege of getting to know many. Yosuke Sato, an Arizona alumnus, mentored me early on back in Singapore and believed in me before anyone else did, including myself. Mie Hiramoto, another with a (brief) Arizona connection, was my first ever teacher in linguistics and thought highly of me even when I knew nothing and probably did not deserve it back then. Hadas Kotek often reached out to me (online or otherwise) with words of advice and comfort when I needed them, most notably expressing concern for me in that cafe at the University of Chicago during a lunch break for CLS, which I attended immediately after my mother passed on; I will always remember that. Michael Yoshitaka Erlewine's work has always been inspiring and he graciously welcomed me into the lab he runs in Singapore, even if I am not directly affiliated. Norvin Richards took an interest in my qualifying paper immediately after taking his class at the LSA summer institute in 2017, and has since continued to send his support from afar. Again, there must be countless other researchers and faculty that I am missing here, but I am nonetheless immensely thankful.

I have also met fellow graduate students (many of whom are PhDs now) from other institutions throughout my time here, with many good memories and times spent together. I had good times with Yining Nie, Sarah Hye-Yeon Lee, Emily Moeng, Yilmaz Köylü, and Sarah Babinski, exploring Lexington together during the LSA summer institute, the highlights being the visit to Buffalo Trace Distillery and my first Rocky Horror Picture Show. Carly Sommerlot was also at the summer institute but nothing beats the memory of Flamingo A-go-go in New Orleans during the annual LSA meeting in January 2020. I met Jackie Lai, Yenan Sun, and Sanghee Kim at the two CLS conferences I attended and am pleased to say we have remained friends, cheeering each other on in our respective journeys. Henrison Hsieh is a fellow Southeast Asian foodie and we have gotten to know each other better since first meeting at the summer institute; I look forward to future collaborations on Tagalog verbal argument structure. I met Tamisha Tan, another fellow Singaporean linguist, when she was an undergraduate attending the sum-

mer institute, the story being that I recognized a slight Singaporean accent behind me on the bus on our way to an institute party, turned around, asked her about it, and was proven right that she is Singaporean. She has since gone on to Harvard's department of linguistics and is flying the flag high there, and we have become friends supporting and looking out for each other from afar. I have surely, as I have throughout, missed many names of fellow linguists I met from my travels outside of Arizona; I thank each and every one of you for making a difference and for enriching my experiences.

I met Jialei Zhu together with Louis Shen when I was struggling and at my lowest, and it was her who dragged me out of that darkness. We had many interesting conversations over meals that I made, the best of which being a lexicalist versus non-lexicalist view of verbal argument structure (you are of course a linguist and an argument structure person but why over a nice lunch and wine though...). Then came the pandemic and ensuing chaos; her company was a stabilizing presence and one of the biggest reasons I was able to hold out till this day and complete this dissertation in these months of self-isolation. I look forward to our time together again in the future, wherever it is in the world that might be.

I thank my father Eric Yu, my elder sister Korey Yu, and my younger brother Hanqi Yu for their constant support from afar. To this day, I do not think any of you have any idea what linguistics is and what I work on, but you have always been supportive, checking on my well-being and my finances regularly. I do not know if I will be able to get a job and settle into a life that is considered 'normal' by Singaporean standards (one of my father's biggest worries) given the way this year is going and the impact it has had on the job market, but I think I have learnt in my time here that everyone finds their own path; I am sorry to say that I think mine is not going to be the 'normal' path. Nevertheless, I hope finishing this degree makes you proud. At the very least, you can tell people there is now a 'Doctor' in the family and that counts for something, perhaps.

I have undoubtedly missed mentioning many people who helped make this possible, and so I close with an open invitation. If you feel like I absolutely should have mentioned you but did not, I invite you to send me a text on your preferred social media platform that we both share, yell at me there, and your next drink at the bar, wherever it is in the world and whenever it is safe to do stuff like that again, will be on me.

October 20, 2020

DEDICATION

To Linda Seow Pheow Teo, 1960-2017.
For being my mother,
through all those sleepless nights,
those endless pills for various ailments,
and all the anxiety, pain, suffering, and grief.
You will not read this where you are,
but this is for you.

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ABSTRACT

This dissertation explores the syntax-semantics interface, in particular the argument structure of different root classes in English, through the range of repetitive and restitutive presuppositions produced by the sub-lexical modifier *again*. Chapter 1 lays out the specific theoretical assumptions through which the dissertation is framed. Chapter 2 focuses on repetitive presuppositions with verbs of killing and stealing, showing that they require any event satisfying *again*'s presupposition to be intentionally carried out, but differ in whether the agent argument needs to be identical across the presupposition and assertion. I propose, contrary to modern syntactic and decompositional theories of event structure, that the entailments of agency and causation as well as the the external argument can all be located with the lexical-semantic root for particular root classes in order to capture these observations. Chapter 3 focuses on change-of-state verb roots with quantificational holder arguments, demonstrating that in these contexts, *again* can produce two different kinds of restitutive presuppositions that differ in whether the holder argument is identical across the presupposition and assertion. This is, however, possible only with the transitive causative but not the intransitive inchoative variant of these verbs. This posed difficulties for analyses that propose the two variants share a common result state core. I propose instead that the lexical causative contains a more articulated functional structure in the result state core, specifically in containing an additional verbalizing v head, in order to capture the wider range of restitutive presuppositions available in the causative variant. I then utilize quantificational holder arguments occurring with *again* for this root class to investigate representations of the reversal requirement of *again*'s restitutive presupposition as well as *re*-prefixation, verifying and proposing specific analyses for them. I further explore the range of

presuppositions produced by *again* with degree achievements, which have been used to argue for a scalar, degree-based analysis of deadjectival verbs rather than an event-decompositional one. I show some conceptual and empirical arguments against scalar, degree-based analyses, and propose for a return to a decompositional, state-based analysis, providing a compositional sketch of how it might be implemented. Chapter 4 concludes, connecting the observations and analyses in the dissertation to wider theoretical debates and discussing possible cross-linguistic extensions.

CHAPTER 1

Introduction

This dissertation is, broadly speaking, concerned with the syntax-semantics interface, the interaction between syntactic structure and the semantic interpretations computed from these structures. Specifically, it is concerned with the argument structure of verbs in English, where and how a verb's arguments are expressed, and how they are interpreted when interacting with other elements within a sentence. The relevant element that a verb's argument structure interacts with that is examined in this dissertation is adverbial *again* in English, which is well-documented and investigated within the argument structure literature. In this dissertation, I present some empirical observations that have been relatively less discussed in this literature and argue for particular semantic representations of verbal roots, the syntactic and semantic core of what goes into a verb, based on how they interact with *again* and what it shows us about how they associate with their external and internal arguments.

From that simple description of the aim of this dissertation, one can discern a host of theoretical assumptions and particular terms that need to be unpacked in greater detail. I devote this opening chapter to discussing the theoretical framework through which I frame the chapters to follow, including the overall architecture of the grammar and the ways in which the syntax and semantics are formalized. In addition, I also provide a brief theoretical backdrop for the analysis of *again*, and clarify the particular notations and the general approach toward the presentation of the English data and judgments utilized. It should be noted that these introductions will be necessarily brief, focusing on the parts that are relevant for the coming chapters and will therefore be gleaned mostly from pub-

lished overviews of particular frameworks and work on particular phenomena in question. The coming chapters will present data and generalizations that, at times, support particular hypotheses and other times, argue against them. While the general theoretical backdrop is presented in this chapter, I will return to relevant aspects when the data and hypotheses in each of the individual chapters require it.

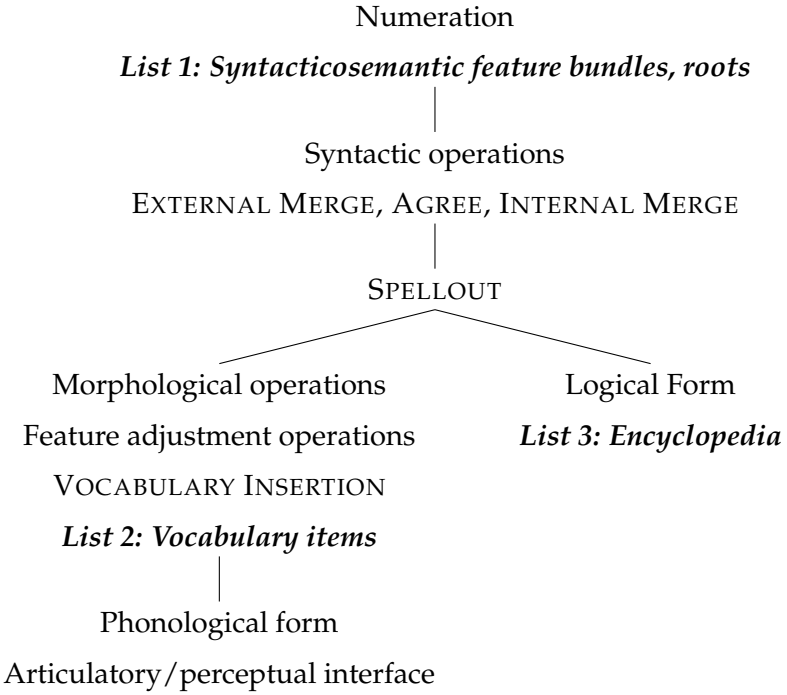
With that brief, mostly theory-free description of this dissertation in place, let us now proceed to lay out the specific theoretical assumptions adopted here.

1.1 The Architecture of the Grammar: Distributed Morphology

1.1.1 The Syntax

The overall architecture of the grammar adopted here will be that of Distributed Morphology (DM), beginning with the work of Halle and Marantz (1993), and elaborated further and adopted by Harley and Noyer (1999), Marantz (1997), Pylkkänen (2008), Harley (2012b), and many others. The following figure, adapted from Harley and Noyer (1999) and Harley (2012b), illustrates the overall workings of DM.

(1.1)



Generally speaking, DM adopts the same overall architecture as espoused in Chomsky's (1995) Minimalist Program, with the key difference being that there is no notion of a 'word'. Rather, it is assumed that there is a single syntactic mechanism that not only generates complex phrasal structure but also complex, word-internal morphological structure i.e., syntactic hierarchical structure all the way down (Marantz, 1997). What is manipulated and combined by the syntactic combinatory mechanism is not the sound-meaning pairing traditionally labeled a 'word', but rather bundles of syntacticosemantic features. There are two broad classes of such features, what have been called *f-morphemes* and *l-morphemes*. As described by Harley and Noyer (1999) and Harley (2012b), f-morphemes make deterministic and predictable semantic contributions to the final derived structure, examples being number features like [+PLURAL] or tense features like [+PAST], and build up the functional spine of the syntactic derivation. On the other hand, l-morphemes contribute idiosyncratic, encyclopedic, and non-predictable information to the syntactic derivation, typically called roots

following Pesetsky (1995). These are the morphemes that distinguish, for example, *cat* from *dog*, and are notated as $\sqrt{\text{CAT}}$ and $\sqrt{\text{DOG}}$ respectively. There is thus a collection of these syntacticosemantic feature bundles and roots, labeled list 1 in the figure in (1.1), a subset of which are selected from this collection to form a *numeration* for the syntactic computation.

The syntactic computation proceeds once a subset of syntacticosemantic feature bundles and roots have been selected, and are subject to syntactic operations like EXTERNAL/INTERNAL MERGE, and regulated by feature checking or feature unification operations like AGREE. Chomsky (1995) makes a further distinction between interpretable and uninterpretable features, with the requirement that all uninterpretable features must be removed by the end of the syntactic computation, though this will not concern us much here. At the end of the syntactic computation, the built structure is then sent to be interpreted by the phonological and semantic interfaces, a stage termed SPELLOUT. Again, while it will not concern us here, Chomsky (2001) further proposes that the output of the syntactic computation is sent piecewise to SPELLOUT rather than wholesale, with each discrete part that is sent to SPELLOUT before the syntactic computation proceeds termed a *phase*.

At SPELLOUT, the computed structure is sent separately to the two different interfaces. At the phonological branch, the structure undergoes a series of morphological and morphophonological adjustment operations, with the resulting structure subject to the operation of VOCABULARY INSERTION. Here, a second list of phonological form-feature bundle pairs is accessed, providing each terminal node within the structure with phonological realizations. These pairs, termed VOCABULARY ITEMS (VIs), are underspecified and compete to realize particular feature bundles on terminal nodes via a 'best fit' principle, whereby the VI whose syntacticosemantic feature bundle comes closest to those of the terminal node will be inserted to realize the phonological form of the terminal node (see Harley

and Noyer, 1999 for detailed discussion). It is the semantic side of the derivation that this dissertation will be concerned with, and I devote the next section to spelling out the assumptions of the overall picture here.

1.1.2 The Semantics

At the semantic side of SPELLOUT, a third list is accessed, termed the Encyclopedia. This provides each terminal node with a semantic interpretation, with f-morphemes given deterministic and predictable semantic denotations while l-morphemes or roots are given their idiosyncratic information that correspond to knowledge about the world. I represent these semantic interpretations of both f-morpheme and l-morphemes using the typed lambda calculus of truth-conditional, model-theoretic semantics of the sort espoused in Heim and Kratzer (1998). The three basic types I utilize and discuss most are *e* for the type of individuals, *s* for the type of events, and *t* for the type of truth values. One other type that will be relevant is *w*, the type of a world in an intensional, possible world semantics which I will discuss and make reference to in chapter 2, though I do not formally represent it in the lambda formulae I write and will set it aside here. Each terminal node within the structure is interpreted as a function with a particular semantic type, with the inventory of possible types given a recursive definition and the collection of all the expressions of identical type forming a domain (Heim and Kratzer, 1998, pp. 28).

(1.2) Semantic types

a. *e*, *s*, and *t* are semantic types.

b. If σ and τ are semantic types, then $<\sigma,\tau>$ is a semantic type.

c. Nothing else is a type.

(1.3) Semantic denotation domains

a. D_e: D (the set of individuals)

b. D_t: {0,1} (the set of truth values)

c. For any semantic types σ and τ, $D_{\sigma,\tau}$ is the set of all functions from D_σ to D_τ.

In principle, the recursive definition provides for an infinite number of semantic types. Nonetheless, there will only be a few types that will be relevant to the discussion here, corresponding either to the types of f-morphemes or l-morphemes. For example, it is a common observation that natural language allows for verbs that take up to a maximum of three individual arguments corresponding to ditransitive verbs, but no more than that. Adopting an event-based semantics where verbs are functions from the number of individual arguments they take to functions from events to truth values, this means that for verbs we see at most functions of type $<e,<e,<e,<s,t>>>>>$, and none that take any more individual arguments than that.[1] Why that should be the case and what is the nature of the constraint that predicts this remains an open question in the literature and I will set it aside here.

In terms of the calculation of the overall semantic denotation of a linguistic expression, I follow the largely standard view that this process is *compositional*, as formulated in the Principle of Compositionality (Partee, 1984).

(1.4) The Principle of Compositionality: The meaning of a complex expression is a function of the meaning of its parts and of the way they are syntactically combined.

The denotation of a particular complex expression is computed from the denotation of its parts and the way they are combined via a limited set of compositional

[1]This is assuming a tripartite structure of a verb, consisting of VOICE, a categorizing little v, and an acategorial root that represents the encyclopedic content of the verb, to be discussed below. The whole VOICE + v + root complex will take no more than three arguments, even if some arguments are strictly speaking, severed from the root and v (Kratzer, 1996).

rules as in Heim and Kratzer (1998). The specific rules of composition I will assume are FUNCTION APPLICATION, PREDICATE MODIFICATION, and LAMBDA ABSTRACTION. I briefly provide their formal definitions here, drawing mainly from Heim and Kratzer (1998) and Wood (2012). Any one of these rules may apply to produce the semantic denotation of a particular non-terminal node, consistent with the formal definitions of each rule and the semantic type of the constituents the rule applies to.

(1.5) FUNCTION APPLICATION: If α is a branching node, $\{\beta,\gamma\}$ is the set of α's daughters, and $[\![\beta]\!]$ is a function whose domain contains $[\![\gamma]\!]$, then $[\![\alpha]\!] = [\![\beta]\!]([\![\gamma]\!])$.

(1.6) PREDICATE MODIFICATION (generalized): If α is a branching node, $\{\beta,\gamma\}$ is the set of α's daughters, and $[\![\beta]\!]$ and $[\![\gamma]\!]$ are both in D_f, f a semantic type that takes n arguments, then $[\![\alpha]\!] = \lambda(x_1, \ldots x_n)[[\![\beta]\!](x_1, \ldots x_n) \wedge [\![\gamma]\!](x_1, \ldots x_n)]$.

(1.7) LAMBDA ABSTRACTION: If $x \in \text{VAR}_a$ and $\beta \in D_b$, then $\lambda x.[\![\beta]\!]^x \in D_{a,b}$.

It now remains to outline briefly the kinds of terminal nodes that I am concerned with in this dissertation. Recall that in DM, there is no notion of a word and hence, the notion of a pre-determined syntactic category is incoherent. Rather, it is assumed that lexical category labels like *verb* and *noun* are computed by looking at the structure that a root is embedded in. Specifically, I follow the tradition of postulating categorizing heads in the syntax, where a root must always appear with a head that provides it with its syntactic category, notated using lowercap letters of the category they are intended to endow a root with, such as v, n, and a representing verbal, nominal, and adjectival respectively (Marantz, 1997, 2001; Arad, 2005, a.o). For example, when a root appears in the context of a v, the entire v + root complex would be categorized as verbal. At the phonological interface, VOCABULARY INSERTION would proceed by looking up list 2 for

phonological realizations of the root in the context of *v*. Likewise, in the context of certain roots, *v* can receive different phonological realizations, including being non-pronounced or with overt verbalizers like the suffix *-ize* in English. Similarly, at the semantic interface, the root would be given a semantic type and encyclopedic content, formalized as lambda functions and predicates or relations, while *v* would receive various types of eventive meanings depending on the semantic content of the root.

I follow the tradition of *lexical decomposition* and *event structure* theories in assuming that little *v* heads encode the eventive core of verbs, with roots specifying either the nature of an event or the result of an event. This tradition goes back to work in Generative Semantics (McCawley, 1968; Morgan, 1969; Dowty, 1979, a.o.), which has been subsequently taken up in event structure theories (e.g. Rappaport-Hovav and Levin, 1998), and explicitly translated into DM as being encoded through the combination of *v* heads and roots (Pylkkänen, 2002; Kratzer, 2005; Folli and Harley, 2005; Harley, 2005; Marantz, 2005, 2007; Beavers and Koontz-Garboden, 2020, a.o.). Within the DM literature, little *v* can be assigned at least three different kinds of eventive meanings: DO, CAUSE, and BECOME (Hale and Keyser, 1993; Harley, 1995; Cuervo, 2003; Folli and Harley, 2005; Kratzer, 2005, a.o.). Little *v* can receive these meanings at the semantics branch of the computation via particular kinds of eventive features in the syntactic branch of the computation, such as [+AGENT], [+CAUSE], etc. (e.g. Harley, 2017).[2] I provide the semantic denotations of these 'flavors' of *v* I adopt here below (Dowty, 1979; Folli and Harley, 2005; Kratzer, 2005; Beavers and Koontz-Garboden, 2020). Note that I will not make a semantic type distinction between events and states, taking both to be of type *s*, the semantic type of an event or more accurately, an eventuality (Bach, 1986). Henceforth, I use the same variable e as a variable

[2]The exact inventory of features needed remains an an open question, one which I will abstract away from in this dissertation since I focus mainly on the semantic computation.

over eventualities, and indicate when an event variable ranges over states by subscripting it with s to indicate states i.e., e_s. The lexical entries of v_{CAUSE} and v_{BECOME} hence take a stative constituent as their first semantic argument, relating it to a dynamic, non-stative event represented by CAUSE and BECOME.

(1.8) a. $[\![v_{\text{DO}}]\!]$: $\lambda x.\lambda e.\text{DO}(x,e)$

b. $[\![v_{\text{CAUSE}}]\!]$: $\lambda P_{<s,t>}.\lambda e.\exists e_s[\text{CAUSE}(e,e_s) \wedge P(e_s)]$

c. $[\![v_{\text{BECOME}}]\!]$: $\lambda P_{<e,st>}.\lambda x.\lambda e.\exists e_s[\text{BECOME}(e,e_s) \wedge P(x)(e_s)]$

Moving now to the semantics of the root morphemes, it is generally assumed within the argument structure literature that while roots can take internal arguments, external arguments have a special status in terms of how they semantically combine. This is an observation going back at least as far as Marantz (1984), and given a precise semantic characterization by Kratzer (1996), with subsequent works mostly adopting this as a standard assumption. For Kratzer (1996), external arguments are introduced by a functional VOICE head, via a special rule of EVENT IDENTIFICATION, formally defined below (based on Kratzer, 1996 and Wood, 2012). VOICE is a function of type $<e,<s,t>>$, introducing an individual argument and assigning it its thematic interpretation. In particular, it is assumed that the thematic interpretation VOICE assigns is dependent on the kind of vP it combines with, as laid out in (1.10) (Kratzer, 1996; Folli and Harley, 2005; Wood, 2012; Myler, 2014, a.o.).

(1.9) EVENT IDENTIFICATION: If α is a branching node, $\{\beta,\gamma\}$ is the set of α's daughters, where $[\![\beta]\!]$ is in $D_{e,st}$ and $[\![\gamma]\!]$ is in $D_{s,t}$, then $[\![\alpha]\!] = \lambda x_e.\lambda e[[\![\beta]\!](x)(e) \wedge [\![\gamma]\!](e)]$.

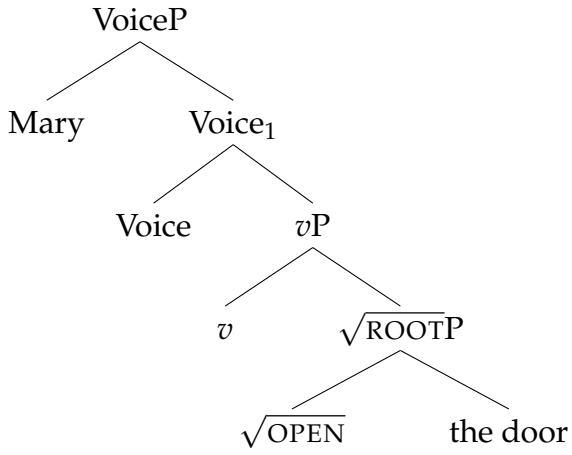
(1.10) a. $[\![\text{VOICE}]\!] \rightarrow \lambda x.\lambda e.\text{AGENT}(x,e)$ / ___ agentive, dynamic event

b. $[\![\text{VOICE}]\!] \rightarrow \lambda x.\lambda e.\text{CAUSER}(x,e)$ / ___ causing event

c. $[\![\text{VOICE}]\!] \rightarrow \lambda x.\lambda e.\text{HOLDER}(x,e)$ / ___ stative or change-of-state event

Putting these pieces together, we arrive at a tripartite structure of what is traditonally called a 'verb', composed of a root morpheme, one of a number of possible kinds of verbalizing v, and one of a number of possible kinds of VOICE heads (Harley, 2009, 2013; Marantz, 2007, 2009; Pylkkänen, 2002, a.o.). It is further assumed that a root morpheme that forms the core of a verb can be inserted into the syntactic structure in one of two positions: either as a modifier of v that semantically further specifies the nature of the event introduced by v, or as the structural complement of v together with an internal argument, typically interpreted as the result of the event introduced by v (Rappaport-Hovav and Levin, 1998, 2010; Harley, 2005, 2012a, 2014; Embick, 2009; Beavers and Koontz-Garboden, 2020, a.o.). For concreteness, I illustrate here an example of a root morpheme $\sqrt{\text{OPEN}}$ that appears as a complement to v with its internal argument, with v interpreted as introducing a causing event, and with VOICE conditioned to introduce a CAUSER argument.[3] Note that in this structure the root $\sqrt{\text{OPEN}}$ is given an encyclopedic denotation as being a predicate of states of openess.

(1.11) Mary opened the door.



[3] I simplify the semantics of the definite determiner and represent the internal argument using the object language here for illustrative purposes. The semantics of the determiner will play a crucial role in chapter 3 and will hence be translated into the metalanguage there.

(1.12) a. $[\![\sqrt{\text{OPEN}}]\!]$: $\lambda x.\lambda e_s.\text{OPEN}(x,e_s)$

b. $[\![\sqrt{\text{ROOT}}\text{P}]\!]$: $\lambda e_s.\text{OPEN}(\textit{the door},e_s)$

c. $[\![v]\!]$: $\lambda x.\lambda e.\text{CAUSER}(x,e)\ \lambda P_{<s,t>}.\lambda e.\exists e_s[\text{CAUSE}(e,e_s) \wedge P(e_s)]$

d. $[\![v\text{P}]\!]$: $\lambda e.\exists e_s[\text{CAUSE}(e,e_s) \wedge \text{OPEN}(\textit{the door},e_s)]$

e. $[\![\text{VOICE}]\!]$: $\lambda x.\lambda e.\text{CAUSER}(x,e)$

f. $[\![\text{VOICE}_1]\!]$: $\lambda x.\lambda e[\text{CAUSER}(x,e) \wedge \exists e_s[\text{CAUSE}(e,e_s) \wedge \text{OPEN}(\textit{the door},e_s)]]$

g. $[\![\text{VOICE}\text{P}]\!]$: $\lambda e[\text{CAUSER}(\textit{mary},e) \wedge \exists e_s[\text{CAUSE}(e,e_s) \wedge \text{OPEN}(\textit{the door},e_s)]]$

The coming chapters will present data and generalizations that will argue against various aspects of the overall picture presented here, specifically the severing of the external argument from the verb root as well as the so called small clause analysis of lexical causatives as in (1.11) (Hoekstra, 1988; Harley, 2005, 2012a, a.o.). Accordingly, I will review in more detail the original motivations and arguments for these analyses in the following chapters. For now, I take this as the general theoretical backdrop and the basis on which I begin my discussion of different verb classes and their behavior when interacting with *again*.

1.2 The Repetitive-restitutive Ambiguity with *Again*

Ambiguities in the interpretations of sentences containing lexical items like *again* in English have been noted since various works in Generative Semantics (Morgan, 1969; McCawley, 1971; Dowty, 1979, a.o.). This repetitive-restitutive ambiguity is by now well-known in the literature, and I provide a representative example below, previewing the detailed discussion in chapter 3. Simply put, the repetitive interpretation involves the repetition of a prior *event*, while the restitutive interpretation involves repetition of a prior *state*.[4]

[4] As noted by many in the literature, the repetitive-restitutive ambiguity disappears when *again* is afforded contrastive focus, producing only the repetitive presupposition (Fabricius-Hansen,

(1.13) Mary opened the door again.

a. Mary previously opened the door and she opened it again.
(*repetitive*)

b. The door was previously open and Mary opened it again.
(*restitutive*)

While generative semanticists were the first to suggest that the meanings of verbs can be decomposed into discrete semantic primitives like CAUSE as shown in (1.12g), they assumed that the decomposition is located in a conceptual semantic language rather than within the syntactic structure (von Stechow, 1996). As far as I know, von Stechow (1995, 1996) was the first to give this idea syntactic shape, suggesting that this decomposition is represented directly in terms of syntactic structure. For von Stechow (1995, 1996), the source of the repetitive-restitutive ambiguity is reduced to a scope ambiguity. The motivation for this is represented in the following examples with the German equivalent of 'again' *wieder*, the core observation being that the availability of the restitutive reading is sensitive to the position of the object (von Stechow, 1996, pp. 87-88).

(1.14) a. Ali Baba sesame **wieder** öffnete.
Subject Object again opened
(*repetitive/restitutive*)

2001; Jäger and Blutner, 2003; Beck, 2006).

(i) Mary opened the door AGAIN.

a. Mary previously opened the door and she opened it again. (*available*)

b. The door was previously open and Mary opened it again. (*not available*)

Beck (2006) offers an analysis for the lack of ambiguity under focus based on the interpretation of focus as introducing a set of alternatives. In this dissertation, I concentrate on cases of sentences with *again* with standard English stress patterns without accents indicating focus. The precise interactions of the cases I am concerned with here with focus accents on *again* will have to be left for future inquiry.

b. Ali Baba **wieder** sesame öffnete.
Subject again Object opened

(*repetitive*)

The ambiguity would fall out if there was a syntactic constituent containing the object and the surface verb that denotes a state of being open, and if the subject and object both undergo syntactic movement to case-checking positions (von Stechow, 1996). In other words, the position of *wieder* in relation to the subject and object indicates the size of the syntactic constituent it attaches to. When following the object, it indicates that it is either attached to the stative constituent or to a higher position that includes the causing event, producing the ambiguity. When preceding the object, it must mean that *wieder* is attached high, including the causing event in its scope and hence is only interpreted repetitively. The following structures in bracketed notation from von Stechow (1996, pp. 88) illustrate; note that the subject and object will subsequently raise in the syntax to their case-checking positions (SpecAgrS-P and SpecAgrO-P) in German, producing the surface linear order .

(1.15) a. SpecAgrO **again** [$_{VP}$ Ali Baba [$_{SC}$ **again** [$_{SC}$ sesame open]] CAUSE]

b. **again** [$_{AgrO-P}$ Spec-AgrO [$_{VP}$ [Ali Baba [$_{SC}$ sesame open] CAUSE]]

Similar observations hold in English, where word order plays a role in whether the repetitive-restitutive ambiguity is observed. As noted by Beck and Johnson (2004), *again* does not exhibit the repetitive-restitutive ambiguity shown in (1.13) when it attaches leftward preceding the subject, or when it attaches following the subject but pre-verbally.

(1.16) Again, Mary opened the door. / Mary again opened the door.

a. Mary previously opened the door and she opened it again.

(*available*)

b. The door was previously open and Mary opened it again.
(*not available*)

This falls out if leftward-attaching or pre-verbal *again* is attaching to either the *v*P or above VOICEP under current assumptions as shown in (1.11) and (1.12). In both these positions, *again* would scope over a causing event, producing only a repetitive interpretation. Rightward-attaching *again* would then attach either to the $\sqrt{\text{ROOT}}$P or to *v*P; attaching to $\sqrt{\text{ROOT}}$P produces a restitutive interpretation, while attaching to *v*P produces a repetitive one. Note that attaching to *v*P would mean that *again* does not scope over the subject, producing what Bale (2007) calls a subjectless presupposition, which I utilize as a probe into the argument structure of certain root classes in chapter 2.

Further evidence that the interpretation of sentences with *again* is determined by the syntactic constituent that it attaches to comes from interactions with other elements within the sentence, such as adverbial adjuncts. The general observation is that the interpretation of these sentences must include the information of the adverbial adjunct contained within the constituent that *again* attaches to, but not those outside of it. Bale (2007, pp. 459) provides the following examples for rightward-attaching *again*.

(1.17) CONTEXT: Two weeks ago, I met Esme at her house on a Wednesday. At that time, we planned to meet the following week. So...

a. I met her again in Jeanne-Mance Park on a Tuesday.
Syntax: ... [[[met her] again] in Jeanne-Mance Park on a Tuesday] ...
(*satisfied*)

b. I met her in Jeanne-Mance Park again on a Tuesday.
Syntax: ... [[[met her in Jeanne-Mance Park] again] on a Tuesday] ...
(*not satisfied*)

c. I met her in Jeanne-Mance Park on a Tuesday again.

Syntax: ... [[met her in Jeanne-Mance Park on a Tuesday] again] ...
(*not satisfied*)

In the above example, the position of *again* imposes conditions on the context based on where it attaches. In (1.17a), the condition is that I must have met Esme before, in (1.17b) I must have met Esme at Jeanne-Mance Park before, and in (1.17c) I must have met Esme at Jeanne-Mance Park on a Wednesday before. The provided context satisfies the condition imposed by *again* only in (1.17a), and hence the other sentences are not acceptable in the given context. This provides further support, in addition to the observation in (1.16), that the interpretation of sentences with *again* is uniquely determined by the syntactic constituent it attaches to, and therefore that the correct analysis of the repetitive-restitutive ambiguity is one based on syntactic scope.

Note that the observation in (1.16) also provides empirical support that the repetitive-restitutive ambiguity cannot be reduced to a matter of entailment. As noted by Lechner et al. (2015, pp. 2), one might plausibly claim that the restitutive interpretation of *again* is not independently available and is simply always a repetitive one, as every context that satisfies the condition for *again* to be interpreted as repetition of a previous event also satisfies the condition for a restitutive interpretation with verbs that can be lexically decomposed like *open*. In other words, the context satisfying a repetitive interpretation asymmetrically entails a restitutive interpretation, as shown below.

(1.18) CONTEXT: Sally opened the door, but a strong gust of wind closed it. she opened the door for a second time so...
Sally opened the door again.

a. Repetitive: There was a previous door-opening event with Sally as agent. (*satisfied*)

b. Restitutive: There was a previous state of the door being open.

(*satisfied*)

As Lechner et al. (2015) note, one can show that if there are particular structural configurations where the repetitive interpretation is available but not the restitutive, we then have evidence that the the ambiguity is a genuine ambiguity due to the structural position of *again*. The example in (1.16) is one such piece of evidence. Lechner et al. (2015) provide a constellation of other instances where only one or the other interpretation is available, thereby suggesting they need to be given independent representations; I will not review them here as they are much too complex to do them justice in this short chapter. The reader is invited to consult Lechner et al. (2015) for the precise details.

With the above discussion in place, it now remains to formalize the semantics of *again* in English. Following Dowty (1979), von Stechow (1996), Beck and Johnson (2004), and Bale (2007) amongst many others, I assume that *again* serves only to introduce a presupposition that the interpretation of the constituent it attaches to held at some previous time prior to utterance time. Formally speaking, *again* is simply an identity function on predicates of events (including states). I provide the semantics of *again* I will assume throughout the dissertation as below, adapting from Bale (2007). In words, the presupposition of *again* requires that there exist two events e^1 and e^2 such that e^1 temporally precedes e^2 and both temporally precede the asserted event, the event denoted by the constituent *again* attaches to must have held at the time of e^1, then negated in the following time interval of e^2, before coming to hold again at the time of assertion.[5]

[5]More precisely, *again* is making reference to the *run-time of the event to which it attaches*. Formally, this can be represented using the temporal trace function τ, which is a function that takes an event as an argument and returns its run-time (Link, 1997; Krifka, 1998). The first conjunct of the presupposition of *again* can be rewritten as $\tau(e^1) \prec \tau(e^2) \prec \tau(e)$. I simplify the notation and use event variables in the presupposition of *again* throughout as does Bale (2007), though the reader should take this to represent the run-times of events.

(1.19) [[again]]: $\lambda P_{<s,t>}.\lambda e.P(e)$
PRESUPPOSITION: $\exists e^1 \exists e^2 [e^1 \prec e^2 \prec e \wedge P(e^1) \wedge \neg P(e^2)]$

Note that this semantics of *again* adapted from Bale (2007) is, in fact, different from the original formulation in von Stechow (1995, 1996), subsequently adopted for English in Beck and Johnson (2004). More precisely, von Stechow's (1995; 1996) semantics of *again* excludes the last conjunct containing negation. In chapter 3, I discuss the implications of this difference, providing empirical evidence that negation needs to be represented explicitly in *again*'s presupposition.[6]

Henceforth, I will refer to the conditions imposed by *again* to be its presupposition, and the contexts accompanying the sentence containing *again* to either satisfy or fail to satisfy the conditions of *again*'s presupposition, regulated by the interpretation of the constituent that *again* attaches to. Thus, in the example in (1.18), (1.18a) and (1.18b) describe the presuppositions derived from *again* attaching to different syntactic constituents (a causing event or a state), and the given context satisfies both of these different presuppositions, leading to the observed repetitive-restitutive ambiguity. In the rest of the dissertation, I will, in my own constructed examples with the verb classes I am discussing, always present sentences with *again* explicitly paired with a given context that either satisfies or fails

[6]It should also be noted that in Bale's (2007) original formulation, *again*'s presupposition makes reference to a contextually provided temporal interval or point, notated *E*, rather than the actual event variable of the asserted event as I have shown above in (1.19). This is to accommodate cases where the assertion asserts that an event did not occur and hence there is no event variable to speak of, such as in negated contexts like *Mary will not open the door again*. Nonetheless, the presupposition produced by *again* here still holds and there must still be a kissing event that occurred before the time at which the asserted sentence is uttered, though not before the time of the event since there is no kissing event. I will adopt a simplified version where *again* makes reference to the event variable of the asserted event, since I do not deal with negation and I do not foresee a difference in predictions or analysis that could possibly arise from this choice in the cases I am concerned with here.

to satisfy *again*'s presupposition, using it as a tool to probe the precise semantic interpretations of verb roots. With examples quoted from published sources, I reproduce them without any changes unless otherwise indicated, regardless of whether supporting contexts were provided or not.

1.3 A Note on Notation and Data

Before closing this introductory chapter, I comment briefly on the notations for (un)acceptability of the examples used throughout the dissertation, as well as clarify the nature of the contexts used in determining the judgments of sentences modified with *again*.

1.3.1 Indicating (Un)acceptability

Since Chomsky (1957), it is widely acknowledged that there are at least two kinds of unacceptability in natural language. Consider the following contrast in WH-questions, one that has received ample attention and is typically notated with the * that indicates unacceptability, a practice has become standard in the syntactic literature.

(1.20) a. What did Mary say Susan liked?

b. * What did Mary wonder why Susan liked?

The question in (1.20b) is, in most of the literature investigating syntactic movement and extraction, regarded as being unacceptable because it violates an *island constraint*, a condition that governs syntactic movement within the syntactic derivation (Ross, 1967). Without going into the details, the prevailing consensus is that WH-movement cannot cross another WH-word in English. Interpreted within Phase Theory (Chomsky, 2001), this is because in order for the WH-word to be extracted from the embedded clause, it must first stop at the edge of the phase

that is the embedded clause, a position already occupied by another WH-word *whether*. The source of the unacceptability is hence due to constraints that are violated within the syntactic derivation, and these are constraints that regulate the application of syntactic operations like INTERNAL MERGE.

In contrast, consider the now famous sentence provided by Chomsky (1957), meant to illustrate the autonomy of the syntactic derivation from the semantic computation.

(1.21) # Colorless green ideas sleep furiously.

As Chomsky (1957) notes, native speakers find this sentence unacceptable, but in a different way from (1.20b). The intuition is that the source of the unacceptability here is 'semantic' in nature, rather than being due to violations of syntactic constraints during the syntactic computation. Cast in the terms being discussed here, the anomaly results from an incompatibility between the encyclopedic content of the root morpheme $\sqrt{\text{SLEEP}}$ with the semantic properties of the subject *colorless green ideas*, as the root morpheme requires an animate subject (Harley, 2012b). In addition, the denotation of *green* is incompatible with *colorless*, since adjectival modification is interpreted using PREDICATE MODIFICATION, denoting the intersection of two sets; here, intersecting the set of individuals denoted by *green* and *colorless* returns an empty set, meaning that the subject *colorless green ideas* has no meaning. Semantic anomaly here is indicated in a different way from syntactic unacceptability, notated using the # symbol.

In light of these two sources of unacceptability, the cases discussed in this dissertation in regards to the (in)felicity of sentences containing *again* will mainly be of the second sort. If a sentence containing *again* in a particular context is judged unacceptable, that unacceptability will be a kind of semantic anomaly. Importantly, however, the semantic unacceptability stems not from an incompatibility between the root morphemes and other elements within the sentence,

but from the incompatibility of the given context with the content of *again*'s presupposition, regulated by the syntactic constituent it attaches to as discussed in the previous section. Similarly, when a sentence containing *again* is judged to be acceptable in a given context, it is because the context satisfies the conditions imposed by *again*'s presupposition. Henceforth, for consistency, I will notate the (un)acceptability of a sentence with *again* in a given context with the symbols ✓ and #, representing acceptable and unacceptable respectively. Cases where the judgment is neither categorically ✓ or #, or when I am unclear about the judgment, will generally be notated as ?? representing questionable. Examples from the literature will be quoted with the judgments of the respective authors in order to remain faithful to their original works. An example of the notation used here is provided below, previewing a particular contrast to be discussed in chapter 3. As we are concerned with the acceptability of the *exact same sentence* containing *again*, it should be clear that the semantic anomaly results from (in)compatibility with the given context, rather than from any structural or semantic properties of the sentence itself.

(1.22) a. CONTEXT: There are two doors, one of which was built open and the other built closed. The wind blows the open door shut. Another gust of wind blew through and the door that was previously open opened.
✓ A door opened again.

b. CONTEXT: There are two doors, one of which was built open and the other built closed. The wind blows the open door shut. Another gust of wind blew through and the door that was previously closed opened.
A door opened again.

1.3.2 More on Contexts

As mentioned previously, the acceptability of sentences containing *again* will always be evaluated with respect to a given context, which I will provide using a linguistic description in the rest of the dissertation. A natural assumption, given that I provide linguistic descriptions of contexts, would be that sentences containing *again* require salient and prior linguistic content, or *antecedents*. In fact, there are certain parallels between the interpretations of sentences with *again* containing certain elements and other kinds of phenomena that require linguistic antecedents. Consider the following contexts compatible with a sentence with *again* containing an indefinite object, previewing once more a particular observation to be discussed in chapter 3. Here, I term the sentence with *again* in (1.23a) as producing a *bound restitutive presupposition*, while in (1.23b) a *quantificational restitutive presupposition* is produced. Intuitively, the difference between the two contexts is whether the door opened at the time of assertion of the sentence with *again* is the same door as the one that was previously in an open state.

(1.23) a. CONTEXT: There are two doors, one of which was built open and the other built closed. The wind blows the open door shut. Mary comes by and restores the previously open door's open state so...
✓ Mary opened a door again.

b. CONTEXT: There are two doors, one of which was built open and the other built closed. The wind blows the open door shut. Mary comes by and opens the door that was always closed so...
✓ Mary opened a door again.

The difference between these two contexts is reminiscent of another kind of ambiguity observed in English VP-ellipsis, a kind of ellipsis where the VP in a sentence is omitted under identity with a VP of a preceding sentence.[7] The obser-

[7] I thank Heidi Harley (personal communication) for first pointing out this parallel to me.

vation is that in cases where the object in the antecedent VP contains a pronoun or a quantified object (e.g. a numeral), a so-called strict versus sloppy identity ambiguity arises, as first noticed by Ross (1967) (also called an E-type versus quantificational interpretation in Takahashi, 2008 for numerals). In (1.24a) with a pronoun, the strict interpretation of the elided object requires Mary to also like Susan's mother, while in the sloppy interpretation Mary likes her own mother. In (1.24b) with an elided numeral object, the strict (E-type) interpretation requires Mary to like the same three teachers Susan likes, while the sloppy (quantificational) interpretation allows Mary to like three different teachers from the ones Susan likes.

(1.24) a. Susan loves her mother, and Mary does ~~loves her mother~~ too.

b. Susan loves three teachers, and Mary does ~~loves three teachers~~ too.

The striking parallels in the interpretations suggest that the phenomena in (1.23) and (1.24) can be given a unified analysis. Specifically, any such analysis would have to make reference to the presence of a *linguistic antecedent*. Putting aside the details of proposals that have been put forth in the ellipsis literature, this would suggest that the contexts I have been providing so far are really linguistic antecedents, and that the interpretations of sentences with *again* are due to some process of referencing its antecedents contained in the contexts. Nonetheless, I will refrain from making the claim that *again* invokes the presence of prior linguistic antecedents, whether explicit or implicit, for two reasons.

First, even though I gave linguistic descriptions of contexts, it is simply out of convenience rather than linguistic contexts being necessary. One gets the sense, for example, that if I presented a series of pictures illustrating the same context as its linguistic description, a native speaker of English would still be able to judge whether a sentence containing *again* is (un)acceptable. Second, one might immediately suggest that sentences with *again* really just involve implicit linguis-

tic antecedents that are not expressed, and that these linguistic antecedents are made salient by the utterance itself. However, it is not the case that these implicit linguistic contexts *must* be present in order for sentences with *again* to be acceptable. Intuitively speaking, it is not difficult to imagine that a speaker can utter a sentence containing *again* to a hearer without providing any prior explicit or implicit linguistic material. In other words, a sentence containing *again* can be uttered 'out of the blue' without any prior (linguistic or otherwise) context, and a hearer will still be able to discern, based on a relevant state of affairs or a reconstructed state of affairs in which the sentence was uttered, whether *again*'s presupposition is satisfied (Beck, 2006). Following Beck (2006), I will refer to the presupposition of *again* as defining an *admittance condition* on possible contexts, as expressed in the logical formula in (1.19) and which can be given linguistic expression by the sentence it attaches to. The contexts themselves can be taken to be linguistic or non-linguistic. Thus, in example (1.18), which I reproduce below, *again*'s presupposition can be given linguistic expression because the linguistic context that gives content to this admittance condition can be gleaned from the constituent that *again* attaches to. The given context need neither be linguistic nor be salient in order for the sentence with *again* to be acceptable. However, a speaker can judge the acceptability of the asserted sentence if given a context or can construct a context in which the asserted sentence is acceptable, namely, by checking whether the given or constructed context entails the linguistic expression of *again*'s presupposition (Beck, 2006).

(1.25) CONTEXT: Sally opened the door, but a strong gust of wind closed it. she opened the door for a second time so...
Sally opened the door again.

a. Repetitive: There was a previous door-opening event with Sally as agent. (*satisfied*)

b. Restitutive: There was a previous state of the door being open.

(*satisfied*)

I will therefore continue to assume throughout the dissertation that the given context allows one to probe whether a repetitive or restitutive presupposition is available, and are not (necessarily) linguistic propositions that need to be salient in the discourse in order for a sentence containing *again* to be acceptable. Accordingly, I do not commit to whether these contexts are considered linguistic antecedents and do not adopt the strict and sloppy identity terminology. Nonetheless, this should not rule out the possibility that there are some deep formal parallels between how the strict and sloppy interpretations of VP-ellipsis and the *bound* and *quantificational restitutive presuppositions* I am concerned with are derived, since strict and sloppy interpretations arise in contexts outside of VP-ellipsis, such as in the interpretations of pronouns.[8] Rather, it is simply not the aim of this dissertation to explore a unified analysis of these phenomena, and thus I set it aside here.

1.3.3 Variation in Acceptability

It is by now commonplace to find that acceptability judgments within the literature for various constructions and grammatical phenomena are often not categorical and can be a matter of degrees of acceptability. It is not my intention, of course, to discuss acceptability judgments in detail; for an overview of the history, definitions, and issues with judgment data, I refer the reader to the important and detailed discussion in Schütze (1996). Rather, I would like to anticipate the possibility that as the reader follows the observations and arguments in this dissertation, they may find that they do not agree with the presented judgments

[8]See, for example, the discussion in von Stechow (1996) regarding strict and sloppy readings of a pronoun within the scope of *wieder* 'again' in German, such as in sentences like *Mary took the name of her husband again*. I will not discuss such cases in this dissertation.

about the acceptability of particular sentences, whether it is in the given contexts or simply presented in isolation. Since I am concerned with the behavior of root classes in regards to being modified with *again*, one natural explanation for a reader disagreeing with a judgment for a particular root is that for the reader, that particular root does not pattern with other roots proposed to be in the same class and may instead belong to another class. In other words, particular roots may belong to different classes in regards to certain syntacticosemantic phenomena, and this reduces to a difference in how the Encyclopedia in the DM sense is organized for different speakers. The task then, when encountering a difference in acceptability in judgment for particular roots, is to determine if the same variation is observed with other roots proposed to be in the same class, and to refine the semantic denotation given to the particular root or root class. Hence, differences and variations in judgments can be accommodated by considering the possibility that the Encyclopedia, being a list of pairings of idiosyncratic, real world knowledge (formalized as semantic denotations) with syntacticosemantic features, could be subject to variation in how it is organized in the grammars of different speakers; nothing in this response to variation requires the abandoning of the main premises of the dissertation, which is that sub-lexical modifiers like *again* can be utilized to illustrate semantic generalizations with classes of roots and probe the inner workings of the syntax-semantics interface. I believe, therefore, that disagreement or variations in the judgments presented in this dissertation do not necessarily invalidate the specific hypotheses being proposed, but simply require recategorization of roots and root classes, or refinement in the proposed semantics for them.

That said, a good portion of the observations and judgments presented here has been verified with native speakers of (mostly) American English, as well as submitted to and presented at major conferences in North America and Asia (see individual chapters for details). In these presentations and reviews, I have so

far encountered only one major disagreement with acceptability judgments from an anonymous abstract reviewer, concerning the bound versus quantificational restitutive presupposition discussed in chapter 3. Nonetheless, since I have not encountered any resistance to the acceptability of this case beyond the abstract reviewer, I will proceed in this dissertation with the acceptability judgments presented, assuming that they are, for the most part, shared between native speakers of American English. Since I reproduce examples quoted from the literature as faithfully as possible unless otherwise indicated, I will also reproduce the judgments in acceptability that the authors provide without committing to whether they are acceptable for me personally, or shared across multiple speakers. For examples constructed in this dissertation that have not been presented publicly or verified with more than two speakers, I will generally make it explicit that this is so (e.g. *To my ear, this sounds (un)acceptable...*). In all cases, I wish to make clear that some amount of variation is to be expected and they do not necessarily render the specific hypotheses invalid. Rather, these variations in judgments should be welcomed as windows into the beginnings of a theory of the organization of the Encyclopedia and the range of possible differences that can be observed across individuals, to be explored more carefully in different and more focused work (see Kelly, 2013 for an explicit theory of the Encyclopedia).

1.4 Outline of the Dissertation

I close this introductory chapter by giving a brief overview of the organization of this dissertation. Chapter 2 discusses repetitive presuppositions of *again* with verbs of killing and stealing, showing that the lack of subjectless repetitive presuppositions and the inability for such presuppositions to exclude intentionality of the agent with verbs of killing and stealing pose problems for tripartite structural analyses of verbs. Rather, I maintain a tripartite structural representation of

such verbs, but allow for the agent arguments and related semantic entailments like intentionality to be directly introduced by the verb root. This in turn has implications for various hypotheses that seek to constrain the possible meanings that verb roots can introduce, and I show that the observations and analyses proposed for verbs of killing and stealing argue against such hypotheses.

Chapter 3 discusses restitutive presuppositions with change-of-state verbs that undergo the lexical causative-inchoative alternation, specifically when they take quantificational objects as their internal arguments. I show that when the internal arguments of such verbs are quantificational, in particular indefinites, an ambiguity arises in *again*'s restitutive presupposition with the causative but not the inchoative, which can be paraphrased as whether the entity holding the result state is identical across the presupposed prior event and asserted event. This poses problems for analyses of the alternation that they share a common, stative core. I propose that the roots of such verbs are semantically fully saturated in their argument structures via a bound variable upon insertion into a syntactic event structure, and verbalizing v heads introduce the arguments that bind these variables. I propose as well that there is a difference in the amount of functional structure between the causative and inchoative variants of these verb roots, allowing for an explanation of why the restitutive ambiguity arises for the causative but not the inchoative. I then discuss the implications the analysis has for different theories of *again*'s restitutive presupposition, before moving on to examine another morpho-syntactic process that leads to restitutive presuppositions, namely *re*-prefixation, and also restitutive presuppositions with other classes of verbs like degree achievements.

Each chapter is organized similarly. I begin by giving an overview of the particular theoretical hypotheses advanced in the literature that the chapter will address, and present the main empirical observations that form the core of the chapter. In each case, I discuss how the data pose problems for the hypotheses

discussed at the start of the chapter, and present my formal analyses that address these problems. I then move on to consider other related verb root classes and the theoretical implications they pose, either providing explicit analyses as well or commenting on possible directions for analyzing these. I close each chapter by providing a summary of the main findings, analysis, and issues to be explored further.

We now have, I hope, all we need to be able to situate the coming chapters in the appropriate theoretical contexts; hence, without further ado, let us begin.

CHAPTER 2

Repetitive Presuppositions and Severing the External Argument[†]

I begin in this chapter by utilizing the repetitive presupposition of *again* to explore the status of external arguments, where they are introduced, and what can condition their interpretations. I focus on a particular class of transitive verb roots, dubbed *murder*-type verbs or manner-of-killing verbs in Levin (1993) and Beavers and Koontz-Garboden (2012, 2020). When modified by *again*, these verbs disallow repetitive presuppositions that contain a different agent and also a presupposed prior event that was not carried out intentionally by an agent argument. Given the assumptions about the syntax and semantics of *again* adopted here, I argue that with these verbs, the external argument and the requirement of intentionality must be entailed by these verb roots independent of the structure they are embedded in. This argues against Kratzer (1996), who proposes to sever all external arguments from the verb root. It also argues against the classification in Bale (2007) regarding how verbs associate with their external arguments, where transitive verb roots have their external arguments severed while intransitive verb roots do not. I provide a compositional syntax and semantics for such verb roots that would predict these facts when modified by *again*.

I then discuss what these findings mean for the postulation of a VOICE head. Taking the view that VOICE should be separated from little v in the Distributed Morphology (DM) tradition and that VOICE is the locus of external argument in-

[†]Parts of the material in this chapter were presented at the 94th annual meeting of the Linguistic Society of America and has appeared in the proceedings to the annual meeting as Ausensi, Yu, and Smith (2020c). A manuscript based on the presentation, proceedings, and analysis presented in this chapter has also been submitted as Ausensi, Yu, and Smith (2020b).

troduction and accusative case assignment (Pylkkänen, 2002; Pylkkänen, 2008; Harley, 2009, 2013, 2017, a.o.), the facts with manner-of-killing verbs here would therefore support a view where there is a typology of VOICE heads, such that in particular contexts VOICE can introduce an argument without specifying its interpretation. A manner-of-killing verb root's external argument can then be semantically represented internal to the verb root but syntactically introduced later. This contrasts with verbs of stealing, which can be given the same analysis but crucially without the roots semantically introducing their external arguments, since these verbs allow for subjectless repetititve presuppositions. Overall, this would further add to growing claims in the literature that syntactic transitivity should be separated from semantic transitivity and that functional heads like VOICE and little v can receive different semantic interpretations based on the surrounding syntactic contexts (Schäfer, 2008; Wood, 2012; Myler, 2014; Alexiadou et al., 2015; Wood and Marantz, 2017).

Finally, I connect the analysis proposed here with hypotheses about constraints on verbal meanings, suggesting that the class of manner-of-killing verbs argues against these hypotheses and they should be analyzed as stative roots that entail causation, a kind of eventive meaning usually taken to be introduced by the structure in which roots are embedded in. I close by providing independent evidence from stative passives that manner-of-killing verb roots should be analyzed as stative roots entailing a result state, being inserted in the structure as complements to a verbalizing head. This is in contrast to an alternative analysis where these roots are analyzed as manner roots adjoined to a verbalizing head as an eventive modifier, though there is evidence that other classes of roots, such as ditransitive verb roots of caused possession, can be analyzed this way.

2.1 Setting the Scene: The Status of the External Argument

2.1.1 Severing the External Argument: Kratzer (1996)

It is widely assumed in the current literature that external arguments have a different status in the syntax and semantics of verbs. The observation goes back at least to Marantz (1984), who noticed that while internal arguments, typically objects, can condition special interpretations of a verb, external arguments in subject positions never do. The following examples illustrate; while the meanings of the verbs in (2.1) vary based on the object DP, the meanings of the verbs in (2.2) remain invariant (Pylkkänen, 2002, pp.122-123). The conditioning of special interpretations by the internal argument is not limited to completely frozen idiom chunks; *kill an evening*, for example, permits variation in the complexity of the object DP as shown in (2.3) (Kratzer, 1996; Marantz, 1997). The conclusion drawn is that only internal arguments are true arguments of the verb and are present in a verb's semantic representation while external arguments are not.

(2.1) Internal arguments condition special interpretations

a. throw a baseball
b. throw support behind a candidate
c. throw a party
d. throw a fit
e. kill a cockroach
f. kill a conversation
g. kill an evening watching TV
h. kill a bottle (i.e. empty it)
i. kill an audience (i.e. wow them)

(2.2) External arguments do not condition special interpretations

a. The policeman threw DP.
b. The social director threw DP.
c. Aardvarks throw DP.
d. Harry killed DP.
e. Everyone is always killing DP.
f. The drunk refused to kill DP.
g. Silence can certainly kill DP.
h. Cars kill DP.

(2.3) Variation in size of internal argument for *kill* as *waste time*

a. kill every evening (that way)
b. kill an afternoon (reading old Gazettes)
c. kill a lovely morning (paying overdue bills)

Kratzer (1996) notes as well that in addition to Marantz (1984), many other theories of argument structure privilege the external argument in their formal notations, such as underlining it within a theta-grid to indicate subject status or enclosing it in angled brackets within an event structure template (e.g. Williams, 1981). In particular, Kratzer (1996) discusses objections to Marantz's (1984) from Bresnan (1982) and Grimshaw (1990). In essence, Bresnan (1982) and Grimshaw (1990) argue that Marantz's (1984) observation need not necessarily lead to the conclusion that external arguments are not true arguments of the root; the same empirical facts can be accounted for if we simply privilege the external argument as always being the final argument in the semantic composition of the sentence. In this way, one can then account for why internal arguments condition the interpretation of the verb while external arguments do not as internal arguments always combine with the verb first. Kratzer (1996) suggests one way of implementing this formally is to say that there are multiple homophonous verbs for a

verb like *kill*. Each particular verb *kill* is a partial two-place function that is only defined if the first argument corresponding to the object denotes a particular kind of entity; for *kill* as *waste time*, the partial function is only defined if the internal argument denotes a time interval, and so on and so forth for other meanings of *kill*.

However, one problem that arises when this view is taken is that there does not seem to be any technical obstacle to having a verb's meaning conditioned by the external argument. There should be no formal obstacle to postulating fictitious two-place partial functions which are only defined if the argument that combines last denotes a particular kind of entity as shown in (2.4), where b corresponds to the external argument in subject position, a corresponds to the internal argument in object position, and f is a function that yields truth values for the individuals a and b (Kratzer, 1996, pp. 115). That external arguments nonetheless never condition special interpretations even if such restrictions can in principle be stated formally suggests that they are not true arguments of the verb that combine last, contra Bresnan (1982) and Grimshaw (1990).

(2.4) a. If b is a time interval, then $f(a)(b)$ = True iff a exists during b.

b. If b is a place, then $f(a)(b)$ = True iff a is located at b.

c. If b is a person, then $f(a)(b)$ = True iff b is the legal owner of a.

d. ... ...

Rather, Kratzer (1996) contends that external arguments must truly be external in that they are not contained with the semantic representation of verbs at all. Working within Neo-Davidsonian event semantics, Kratzer (1996) suggests a transitive verb is a function that takes an entity corresponding to the internal argument and an event argument to return a truth value, with no argument position for the external argument. Rather, external arguments are introduced via a functional head in the inflectional domain she labels VOICE. VOICE is a head that

syntactically introduces an argument DP in its specifier and conditions the interpretation of the argument by introducing a thematic role. Taking the notation for semantic types adopted here where *e* is the type of entities, *s* the type of events, and *t* the type of truth values, EVENT IDENTIFICATION takes a function of type <*e*,<*s*,*t*>> and a function of type <*s*,*t*> and returns a new function that, when supplied with an individual and an event argument, returns the conjunction of the result of the two original functions.

(2.5) EVENT IDENTIFICATION:
$f_{e,st} + g_{st} \rightarrow \lambda x.\lambda e[f(x)(e) \wedge g(e)]$

VOICE is a function of type <*e*,<*s*,*t*>>, introducing a thematic role (e.g. AGENT, HOLDER etc.) and combines with a VP via EVENT IDENTIFICATION. An example for the verb *feed* is provided below (Kratzer, 1996, pp. 122).

(2.6) [$_{VoiceP}$ Mary VOICE [$_{VP}$ feed the dog]]

(2.7) a. ⟦feed the dog⟧: λe[FEED(*the dog*)(e)]
b. ⟦VOICE⟧: $\lambda x.\lambda e.$AGENT(x)(e)
c. ⟦VOICEP⟧(⟦feed the dog⟧): λe[AGENT(*mary*)(e) $\wedge$ FEED(*the dog*)(e)]

In this way, Kratzer (1996) suggests that Marantz's (1984) observation receives a direct explanation; since external arguments are never a part of the verb's semantic representation and are introduced via a form of secondary predication, they are predicted to never be able to condition the interpretation of the verb's meaning. Note that this would work the other way as well; since external arguments are never introduced by the verb, in principle the verb should not be able to place special restrictions on its external argument and condition the external argument to have particular meanings (as already noted by Folli and Harley, 2005).

2.1.2 Not All External Arguments Can be Severed: Bale (2007)

Kratzer's (1996) proposal based on Marantz's (1984) observation, while now widely accepted, has not gone unchallenged. In addition to Bresnan (1982) and Grimshaw (1990), who argue against the technical formulation of capturing the subject-object asymmetry, Nunberg et al. (1994) argue that the lack of subject-verb idioms is due to a constraint on idioms to not occur with animate DPs as they typically describe abstract situations in concrete terms. Since subject positions typically correspond with agent arguments that must be animate, subject-verb idioms are comparatively rare, while objects typically corresponding to themes can often be inanimate and hence fit the requirements of idiomatic interpretations. Horvath and Siloni (2002) provide putative counterexamples of subject-verb idioms that they claim argue against Marantz's (1984) generalization and severing the external argument from the verb. Wechsler (2005) further argues that even if the subject-object asymmetry exists, severing the external argument as Kratzer (1996) proposes does not actually solve the problem, since restrictions that a subject DP can place on a verb can be specified at the level of VP through the AGENT thematic role such that if the agent of VP denotes a particular sort of entity, then the partial function denoted by the VP will be true under a certain interpretation of the verb. I will not outline the specific arguments and debates here; see, for example, Harley and Stone (2013) for discussion of Nunberg et al. (1994) and Horvath and Siloni (2002) and counterarguments against their claims.

Instead, I focus here on a particular empirical argument against severing *all* external arguments from the verb as outlined in Bale (2007). The main observation comes from sub-lexical modification with *again*. Bale (2007) assumes a scope-based theory of *again*-modification, where *again* is of type $<<s,t>,<s,t>>$, essentially an identity function on predicates of events introducing a presupposition as repeated in (2.8) (von Stechow, 1995, 1996; Bale, 2007). Repetitive presuppositions are derived when *again* attaches to VOICEP, which would include the agent

argument.

(2.8) [[again]]: $\lambda P_{<s,t>}.\lambda e.P(e)$
PRESUPPOSITION: $\exists e^1 \exists e^2 [e^1 \prec e^2 \prec e \wedge P(e^1) \wedge \neg P(e^2)]$

Bale (2007) observes, however, that if Kratzer's (1996) proposal to sever the external argument is right, then logically one would expect *again* to be able to attach to the VP prior to combining with VOICE, which would produce a presupposition excluding an agent argument. Such *subjectless presuppositions* are indeed observed with transitive activity verbs like *hit* and *kick* (Bale, 2007, pp. 464). As shown in the (b) sentences below, sentence-initial *again*, which must attach to VOICEP including the agent, is unacceptable in the given contexts.[1] On the other hand, the (a) and (c) sentences are acceptable, indicating that there must be a constituent of the right semantic type for *again* to attach before combining with VOICE (whether active or passive). In short, subjectless presuppositions with transitive activity verbs support the proposal that the agent argument is introduced outside of the VP through a VOICE head.

(2.9) 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.

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

[1] As discussed in the opening chapter, leftward attaching, sentence-initial *again* excludes restitutive presuppositions and is therefore argued to attach to a constitutent like VOICEP. This contrasts with rightward attaching sentence-final *again*, which exhibits the repetitive and restitutive ambiguity and can attach to both VOICEP and VP.

a. ✓ Anne kicked it again.

b. # Again Anne kicked it.

c. ✓ It was kicked again.

However, other verb classes seem to resist subjectless presuppositions with *again*. For example, stative transitive verbs like *love* and *hate* do not permit subjectless presuppositions as shown in (2.11) and (2.12) (Bale, 2007, pp. 469). Note again that the passive, which does not have an overt agent argument, is acceptable with *again* in the given contexts. Similarly, intransitive verbs, regardless of whether they are unergative like *run* or unaccusative like *arrive*, also resist subjectless presuppositions as shown in (2.13) and (2.14) (Bale, 2007, pp. 471). Adopting the same logic for subjectless presuppositions with non-stative transitive verbs, it must mean that with stative transitive and intransitive verbs, there is no constituent that *again* can attach to that excludes the external argument (or the raised internal argument in the case of unaccusatives). If so, then these verb classes must not contain a VOICE head that introduces the external argument for that would predict a subjectless presupposition to be possible.

(2.11) CONTEXT: Seymour's mother loved Frank although she was the only one who did. After a while she no longer cared for Frank. 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.

c. # Again Seymour loved Frank.

(2.12) CONTEXT: Seymour's sister hated George. But she seemed to be the only one who did. After a while George worked his charm on her and the hatred subsided. After a few months, Seymour realized that George's charm was all an act, Underneath, he was pure evil. So...

a. # Seymour hated George again.

b. ✓ George was hated again.

c. # Again Seymour hated George.

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

a. # Jon ran again.

b. # Again Jon ran.

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

a. # Seymour arrived again.

b. # Again Seymour arrived.

On the basis of the availability of subjectless presuppositions, Bale (2007) concludes that not all verb classes have their external arguments severed from the verb as in Kratzer's (1996) proposal. Instead, some verbs must take their external arguments directly. In terms of semantic types, non-stative transitive verbs like *hit* would be of type $<e,<s,t>>$, taking only an internal argument. Stative transitive verbs like *love* would be of type $<e,<e,<s,t>>>$, taking both the internal and external argument as semantic arguments. Intransitive verbs would be uniformly of type $<e,<s,t>>$, taking their sole internal or external argument as their semantic argument. Examples of the semantic interpretations for some of these verbs are provided below.

(2.15) a. $[\![\text{hit}]\!]$: $\lambda x \lambda e.\text{HIT}(x,e)$

b. $[\![\text{love}]\!]$: $\lambda y \lambda x \lambda e.\text{LOVE}(x,y,e)$

c. $[\![\text{arrive}]\!]$: $\lambda x \lambda e.\text{ARRIVE}(x,e)$

d. $[\![\text{run}]\!]$: $\lambda x \lambda e.\text{RUN}(x,e)$

2.2 Different Classes of Transitives: Manner-of-killing Verbs

The preceding discussion involved both a theoretical and an empirical claim. Theoretically, Kratzer (1996) suggests that external arguments are introduced external to the verb and thus, it cannot impose restrictions on how the verb is to be interpreted in regards to idiomatic meaning. By the same logic, however, it also predicts that verbs cannot impose semantic requirements on their external arguments. Empirically, Bale (2007) claims that external arguments can only be severed with non-stative transitive verbs and not other classes of verbs. In this section, I show that the Kratzer's (1996) second prediction as well as Bale's (2007) generalization do not hold up; that is, particular classes of non-stative transitive verbs, in particular *murder*-type verbs, disallow subjectless presuppositions and can impose semantic requirements on their external arguments.

2.2.1 *Murder*-type Verbs and Subjectless Presuppositions

I focus here on a class of verbs identified by Levin (1993) as *murder*-type verbs, a sub-class of manner-of-killing verbs which includes verbs like *murder*, *assassinate*, *massacre*, and *slaughter*. Under Bale's (2007) generalization, we would expect *murder*-type verbs to allow subjectless presuppositions since they are transitive non-stative verbs. This is not borne out and *murder*-type verbs in fact do not permit subjectless presuppositions as observed in (2.16) (Ausensi, Yu, and Smith, 2020c). In contrast, other killing verbs like *kill* readily allow subjectless presuppositions as shown in (2.17) (Bale, 2007).[2]

[2]Verbs-of-killing require somewhat unusual contexts with *again*, since the entity that is killed needs to be able to come back to life to be acceptable (Beavers and Koontz-Garboden, 2020). I will, in general, use fantasy and mythical contexts throughout the chapter unless I am quoting examples directly from published literature. I will also separate *murder* and *assassinate* from *massacre* and *slaughter*, since native speakers have a preference for human entities serving as their objects for the former but not the latter. *Massacre* and *slaughter* also seem to have a preference for plural

(2.16) a. CONTEXT: The treacherous knight stabbed the the king in the heart so he can take his throne as king. The king's loyal sorcerer brought him back to life. Before the king could track down the treacherous knight, one of his guards, also wanting to usurp the king, caught the king by surprise by stabbing him in his gut with a hidden dagger so...

The guard murdered / assassinated the king again.

b. CONTEXT: The cruel knights decided to kill the enemy soldiers they have captured from war. The king's sorcerer, aghast at their cruelty, brought the captured enemy soldiers back to life. After they were revived, the king's guards encountered the captive soldiers and wanting to protect the king, ...

The guards massacred / slaughtered the soldiers again.

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

✓ Seymour killed the zombie again.

Consider now what this would mean, assuming Kratzer's (1996) and Bale's (2007) analyses. Verbs like *kill* would support both of their proposals. Since it allows a subjectless presupposition, it must mean that *again* attaches to a constituent excluding the agent, which according to Kratzer (1996) would be the VP prior to combining with VOICE. It would also fall under Bale's (2007) generalization, since it is a transitive non-stative verb. However, *murder*-type verbs would directly contradict Bale's (2007) generalization, suggesting that not all transitive non-stative verbs allow subjectless presuppositions. Assuming Kratzer's (1996)

objects. Nonetheless, I have found that judgments in these mythical contexts are generally stable and I will take them as uncontroversial here.

proposal, we can distinguish two analytical possibilities here. Since subjectless presuppositions with *kill* involve *again* attaching to VP before combining with VOICE, with *murder*-type verbs it must be the case that for some reason VP is not an available site for *again* to attach and it must only be able to attach to VOICEP.

Alternatively, we can say that the external arguments of *murder*-type verbs must be introduced within the VP *again* attaches to such that they will always fall in the scope of *again*'s presupposition. In this case, one might say that VOICE is not needed for *murder*-type verbs since their external arguments are introduced internally directly by the verb. Indeed, this is the view Bale (2007) takes for stative transitive verbs like *love* as shown in (2.15b). Intuitively and pre-theoretically speaking, it would seem that the latter option would be ad hoc and stipulative, since *murder*-type verbs and *kill* are straightforwardly transitive verbs and involve a shared semantic core, which is a state of *being dead* (Beavers and Koontz-Garboden, 2012, 2020). One would then expect them to share the same underlying syntax. On the other hand, the former option would require some explanation of how exactly the VP of *kill* and *murder*-type verbs would differ since *again* would have to be able to attach to the former but not the latter VP. For now, I remain neutral on the analytical options and proceed to discuss how *murder*-type verbs can also impose semantic requirements on their external arguments.

2.2.2 *Murder*-type Verbs and Intentionality

Apart from subjectless presuppositons, it is also well-known that *murder*-type verbs require their external arguments to be an entity capable of intentionally carrying out an action to bring about a result state (Talmy, 1985; Dowty, 1991; Folli and Harley, 2005; Ausensi, 2020; Ausensi, to appear; Ausensi, Yu, and Smith, 2020c, a.o.), contra what Kratzer's (1996) proposal would predict. This is again in contrast to *kill*, which permits both intentional and animate agents as well as inanimate causers as external arguments in (2.18). *Murder*-type verbs, on the

other hand, systematically disallow inanimate causers in (2.19). Two other observations support this restriction. As shown below, the intent of the agent of *kill* can be cancelled via overt adverbial phrases or can be explicitly reinforced as in (2.20), suggesting it is not lexically entailed. *Murder*-type verbs systematically resist these modifications that target the intentionality of the agent external argument as shown in (2.21), suggesting that intentionality of the agent external argument must somehow be encoded by these verbs (Ausensi, 2020; Ausensi, to appear; Ausensi, Yu, and Smith, 2020c).[3]

(2.18) a. The knight killed the king.
b. The explosion / The storm / The magical sword killed the king.

(2.19) a. The soldiers murdered / assassinated / massacred / slaughtered their enemies.
b. # The explosion / # The storm / # The magical sword murdered / assassinated / massacred / slaughtered their enemies.

(2.20) a. The soldiers killed the dragon unintentionally / by accident.
b. The soldiers killed the dragon intentionally / on purpose.

(2.21) a. The soldiers murdered / assassinated / massacred / slaughtered their enemies # unintentionally / # by accident.
b. The soldeirs murdered / assassinated / massacred / slaughtered their enemies ?? intentionally / ?? on purpose.

Given the assumptions adopted here with *again*-modification, we can further probe where exactly the requirement of intentionality is introduced with these

[3]Note, however, that modification with *unintentionally* and *by accident* is possible under a reading where the subject had intended to *murder* / *assassinate* / *massacre* / *slaughter* / *slay* something else but accidentally killed the referent denoted by the object instead. I discuss this 'mistaken identity' reading in more detail when I lay out my analysis.

two classes of verbs. As shown in the previous section, *murder*-type verbs disallow subjectless presuppositions in contrast to verbs like *kill*. This suggests that with verbs like *kill*, there is a distinct constituent that *again* attaches to that excludes the agent external argument. In addition, *kill* also allows presuppositions where the presupposed prior event was carried out unintentionally by a different animate agent; in contrast, *murder*-type verbs systematically disallow such presupposed prior events in (2.22), requiring that the presupposed prior event was intentionally carried out by the same agent in (2.23) (Ausensi, Yu, and Smith, 2020c). Importantly, even if the agent argument is the same across the presupposition and assertion, it is still unacceptable when modified with *again* if the presupposed event is unintentional, as shown in (2.24).

(2.22) a. CONTEXT: The queen accidentally killed the king by stabbing him in the heart while he was teaching her how to fight with a sword. She asked the king's sorcerer to bring him back to life. After being revived, a treacherous knight crept up behind the king and stabbed him in the gut with his sword so...

   i. ✓ The knight killed the king again.

   ii. # The knight murdered / assassinated the king again.

b. CONTEXT: A group of dragons, while practicing swordfighting with the soldiers who train them, accidentally scorched the soldiers to death with their fiery breaths. The king's wizard revived the soldiers. After being revived, the soldiers angrily attacked the dragons. An evil sorcerer, wanting to protect the dragons so he can use them to attack the castle, cast a killing spell on the soldiers so...

   i. ✓ The sorcerer killed the soldiers again.

   ii. # The sorcerer massacred / slaughtered the soldiers again.

(2.23) a. CONTEXT: A treacherous knight crept into the king's bedroom and stabbed him to death so he can take his throne. The queen, being a skilled sorcerer, brought the king back to life. After being revived, the king ordered his men to track down the treacherous knight. While the king was busy gathering his men, the knight, who was hiding behind the throne, drew his sword and stabbed the king in his gut from behind the throne so...

i. ✓ The knight killed the king again.

ii. ✓ The knight murdered / assassinated the king again.

b. CONTEXT: A group of dragons killed the cruel soldiers who train them by scorching them to death with their fiery breaths. The king's sorcerer wizard revived the soldiers. After being revived, the soldiers angrily attacked the dragons. The dragons, retaliate by ripping the soldiers apart with their claws so...

i. ✓ The dragons killed the soldiers again.

ii. ✓ The dragons massacred / slaughtered the soldiers again.

(2.24) a. CONTEXT: The queen accidentally killed the king by stabbing him in the heart while he was teaching her how to fight with a sword. She asked the king's sorcerer to bring him back to life. After being revived, she discovers that the king had ordered his wizard to kill her so he can take a new wife. In rage, the queen secretly took out her hidden dagger and stabbed the king to death in his sleep so...

i. ✓ The queen killed the king again.

ii. # The queen murdered / assassinated the king again.

b. CONTEXT: A group of dragons, while practicing swordfighting with the soldiers who train them, accidentally scorched the soldiers to death with their fiery breaths. The king's sorcerer wizard revived

the soldiers. After being revived, the soldiers angrily attacked the dragons. The dragons, retaliate by ripping the soldiers apart with their claws so...

i. ✓ The dragons killed the soldiers again.

ii. # The dragons massacred / slaughtered the soldiers again.

Consider now the observations with *kill* in (2.22). Since the contexts involve a different agent external argument from the asserted sentence, it must mean that *again* is attaching to a VP prior to VOICE combining with it, as suggested by Bale (2007). We see as well that the presupposed prior event can be unintentional in contrast to the event described by the assertion, which in the context was carried out intentionally. In other words, this means that both the agent argument and the requirement of intentionality must be introduced *outside* of the VP that *again* attaches to with *kill*. This will explain how the given contexts satisfy *again*'s presupposition in (2.22), since the VP contains no specification of the intentionality of the presupposed event and the agent external argument. Contrast that with the observations with *murder*-type verbs as seen in (2.22), (2.23), and (2.24). Applying the same logic as with *kill*, these facts suggest that with *murder*-type verbs, the constituent *again* attaches to must contain both the agent external argument and the requirement of intentionality. In this way, *again*'s presupposition with *murder*-type verbs is only satisfied if the agents across both presupposed and asserted event are the same and both events were carried out intentionally as in the context in (2.23). As noted in the previous section with subjectless presuppositions, I have deliberately not given a label to the constituent *again* attaches to with *murder*-type verbs, since there are in principle two different analytical options as discussed. I return to this issue shortly, discussing first some hypotheses advanced in the literature about the locus of intentionality and agency and where these entailments are introduced.

2.3 On Structural Meanings

The conclusion from the previous section is that with *murder*-type verbs, the constituent *again* attaches to must contain both the agent argument and entailments of intentionality, explaining why these verbs disallow subjectless presuppositions and require the presupposed event of *again* to be carried out by the agent intentionally. In particular, I have thus far avoided committing to what syntactic category this constituent is. In Kratzer's (1996) proposal, this might be a VOICEP, implying that the VP of *murder*-type verbs is unavailable for *again*-modification.

Under the assumptions of DM, however, a VP is really just a shorthand for the constituent consisting of an acateogrial root that is the locus of encyclopedic meaning, and a functional little *v* head that syntactically verbalizes the acategorial root (Halle and Marantz, 1993; Pylkkänen, 2002; Harley, 2009, 2013, a.o.). In addition, verbalizing little *v* heads can also introduce particular kinds of structural meanings, such as eventive meanings like causation and change-of-state encoded by functions like CAUSE and BECOME (Pylkkänen, 2002; Kratzer, 2005; Harley, 2012a; Beavers and Koontz-Garboden, 2017, 2020, a.o.). Relevant to the concerns here, this raises the question of where agent arguments and entailments of intentionality are introduced. For example, are these both introduced by the functional VOICE head of Kratzer (1996)? Is intentionality separately introduced by different elements within the structure (e,g, Folli and Harley, 2005)? Finally, could we simply attribute these components of the verb's meaning to the acategorial root itself? In this section, I discuss some proposals in the literature that intentionality can be a structural meaning encoded in functional heads within the verbal projection as well as arguments that VOICE and verbalizing little *v* must be separate with distinct functions in English. These will set up the theoretical backdrop for determining the analysis of *murder*-type verbs versus *kill*.

2.3.1 Intentionality is Introduced Structurally: Folli and Harley (2005)

I begin here with the intentionality requirement *murder*-type verbs impose upon their external arguments. As mentioned before, within a tripartite verbal structure of VOICE + v + root (Pylkkänen, 2002; Harley, 2009, 2013), intentionality could either be introduced by VOICE, little v, or by the verbal root itself. Kratzer's (1996) original proposal suggested that VOICE itself is the locus of intentionality, as it introduces both an external argument and a thematic role that this argument bears in relation to the VP. One could hence imagine that apart from the AGENT thematic role, VOICE could also introduce other thematic roles like HOLDER where the external argument is predicated of a state, an EXPERIENCER that is the external argument of a psych predicate, or a CAUSER which is the external argument of a causing event that causes a state. The intentionality requirement then is an entailment of the AGENT thematic role and requires the external argument to be an animate entity capable of carrying out an event intentionally (Dowty, 1991).

Alternatively, intentionality can be encoded as a structural meaning introduced by a verbalizing little v head. Folli and Harley (2005), in particular, differentiate between the verbalizers v_{DO} and v_{CAUSE} (see also Hale and Keyser, 1993). v_{DO} conditions the external argument to be an animate agent and takes a nominal complement that is interpreted as THEME, while v_{CAUSE} selects a result state as its complement and imposes no animacy requirement on the external argument. The motivation for such a distinction comes from a particular kind of alternation found with verbs of consumption involving animacy and the presence of a result state. Folli and Harley (2005, pp. 10) observe that consumption verbs in English generally do not allow inanimate causer subjects as their external arguments. However, this restriction is eliminated when consumption verbs appear with a particle that indicates a result state like *away* and *up*, as indicated in below with the verbs *eat*, *carve*, *nibble*, and *chew*.

(2.25) a. John ate the apple.
b. * The sea ate the beach.
c. The sea ate away the beach.
d. The carpenter carved the toy.
e. * The wind carved the beach.
f. The wind carved the beach away.
g. The child nibbled the cookie.
h. * Erosion nibbled the cliff.
i. Erosion nibbled away the cliff.
j. The cowboy chewed the tough beef.
k. * The washing machine chewed the laundry.
l. The washing machine chewed up the laundry.

Such alternations are also observed with verbs of motion, as shown in (2.26) (Folli and Harley, 2005, pp. 11). Unergative verbs of motion typically do not take direct objects, but the addition of particles or prepositional phrases seems to allow these verbs to take direct objects, indicating that additional phrasal elements induce a change in the argument structure of the *v*P.

(2.26) a. The couple waltzed (across the floor).
b. * John waltzed Mary.
c. John waltzed Mary across the floor.
d. Sue jumped.
e. * Sue jumped the horse.
f. Sue jumped the horse over the fence.

Folli and Harley (2005) propose that the addition of a particle in English signals resultative formation via the projection of a small clause that denotes a result

state, with the particle being the head of the small clause. Crucially, this induces a change in the 'flavor' of verbalizing little v with distinct semantics. The addition of a result small clause necessitates causative semantics of the sort proposed by Kratzer (2005) to be introduced by little v. On the other hand, in the consumption reading where the complement to the verb is simply a DP interpreted as an incremental theme, the semantics in little v would be an agentive *doing* event that takes a DP complement (Hale and Keyser, 1993). This change in semantics of the verbalizing little v has semantic consequences on the external argument. As Folli and Harley (2005) note, v_{DO} encodes a *doing* event and hence the external argument of v_{DO} must be interpreted as AGENT. This would require the external argument to be intentional and capable of doing things. v_{CAUSE}, on the other hand, requires causers that initiate a change-of-state. The external argument can thus be an inanimate entity since a state need not necessarily be brought about by an intentional agent. If an inanimate causer is used as the subject of a consumption verb that selects for a DP complement indicating the presence of v_{DO}, a conflict arises between the entailments of v_{DO} and the external argument and results in unacceptability, as illustrated for example in the contrast between (2.25a) and (2.25b). Viewed in Dowty's (1991) terms, both an AGENT and a CAUSER thematic role are instantiations of a PROTO-AGENT role, with CAUSER not having the entailment of volitionality and intentionality that the AGENT thematic role has. In other words, AGENT asymmetrically entails CAUSER, and any causing event can have an intentional agent but doing events disallow inanimate causers.

The general picture that Folli and Harley (2005) adopt then is constructionist; the change in argument structure necessitates a change in the flavor of verbalizing little v, which is the locus of intentionality and which imposes requirements on the external argument. In this sense, intentionality under their analysis is a meaning entailment of the structural template (the flavor of verbalizing little v) and not a requirement of verbal roots of verbs of consumption, which are

attached directly to the verbalizing little v as a modifier through a process like MANNER INCORPORATION proposed in Harley (2005) (see also Embick, 2009).

2.3.2 On the Distinctness of VOICE and v and the External Argument: Harley (2009)

Since Larson (1988) where a VP-shell structure was first proposed, it has become commonplace to label the top VP shell as being headed by a little v. This little v came to be understood as the locus of external argument introduction, accusative case assignment, introducing agentive or causative semantics, and delimiting a cyclical (phasal) domain (Marantz, 1984; Hale and Keyser, 1993; Chomsky, 1995, 2001; Harley, 1995; Marantz, 1997; Folli and Harley, 2005, a.o.). With Kratzer's (1996) proposal about the syntax and semantics of VOICE and how it introduces external arguments, it became natural to identify VOICE as being identical to a little v as mentioned in previous works (as noted by Harley, 2009). Thus, Folli and Harley's (2005) proposal about different flavors of verbalizing little v in fact directly introduced the external argument in the specifier of either v_{DO} or v_{CAUSE}. In recent years, however, there have been arguments from various domains and from cross-linguistic investigation of external arguments and case assignment that there is reason to believe that VOICE and little v should be separated, in line with the assumptions of DM where little v introduces eventive semantics and verbalizes an acategorial root while VOICE introduces the external argument and assigns accusative case, leading to a tripartite structure for what is traditionally called the VP (Pylkkänen, 2002; Harley, 2009, 2013, 2017, a,o,). Here, I present a particular argument from English nominalizations, suggesting that verbalizing little v heads that introduce various kinds of eventive semantics should be separate from VOICE (Harley, 2009).

The main evidence for this claim comes from nominalizations in English that contain overt verbalizers spelled out as suffixes. Going back to Kratzer (1996), she

observes (based on Abney, 1987) that English gerundive nominalizations exhibit two different variants, which she calls of_{ing} and acc_{ing} forms. Descriptively, the difference is that while the direct object of a acc_{ing} nominalization appears in the unmarked accusative case form of English, the of_{ing} variant requires the insertion of a prepositional case marker *of*. The two forms also exhibit different properties in regards to syntactic behavior, with the of_{ing} form behaving like a nominal with adjectival modification and the acc_{ing} form behaving like a verb in taking adverbial modification. This is illustrated below with examples from Harley (2009).

(2.27) a. acc_{ing}: Belushi('s) foolishly mixing drugs and alcohol was the cause of his death.

b. of_{ing}: Belushi's foolish mixing of drugs and alcohol was the cause of his death.

Kratzer (1996) proposed that the gerund *-ing* nominalizer attaches to a VP excluding VOICE for of_{ing} nomianls but to a VOICEP in acc_{ing} nominals. Since VOICE is the locus of accusative case assignment, the lack of a VOICE head in an *-ing* nominal necessitates case marking by *of*. Further evidence for such an analysis comes from the possible interpretations of the DP possessor in both kinds of nominals illustrated below (Kratzer, 1996, pp. 128-129)

(2.28) a. Maria's reading of Pride and Prejudice received better reviews than Anna's.

b. We remembered Maria's reading Pride and Prejudice.

In (2.28a), the nominalizer attaches to a VP without VOICE and hence no agent is present in the event that is being nominalized. As such, the DP possessor *Maria* need not be interpreted as the agent of the reading event. Indeed, (2.28a) is compatible with Maria attending a reading of Pride and Prejudice at a public reading event which received better reviews that the public reading that Anna attended.

The possessor DPs express a general notion of relatedness to the event, of which the AGENT thematic role is but a particular case (Kratzer, 1996, pp. 128). On the other hand, in (2.28) the nominalizer attaches to a VOICEP which includes an AGENT thematic role and the possessor DP *Maria* must hence be interpreted as the agent of the reading event.

As Harley (2009) notes, if one assumes VOICE is the verbalizing little v, the fact that acc_{ing} nominals, which have a nominalizer attached to VOICE, exhibit verbal properties becomes expected. It is simply because they have verbal structure embedded within the nominal. On the other hand, if of_{ing} nominals lack this verbalizing v/VOICE layer, then we expect them to show purely nominal properties, which is borne out in that these only allow adjectival and not adverbial modification. However, Harley (2009) argues that conflating VOICE and v leads to problems with other kinds of nominalizations, specifically with verbalizers that are spelled out overtly. I discuss here one such verbalizer, the suffix *-ize*. Harley (2009, pp. 329-330) notes that *-ize* is verbalizer that can attach to roots or stems to provide different kinds of eventive meanings like causation, change-of-state, or simply a doing event, producing purely causative verbs, verbs that show the causative-inchoative alternation, pure unaccusatives, and unergative verbs.

(2.29) a. Causative meanings: *categorize, terrorize, digitize, idolize*

b. Causative-inchoative alternators: *crystallize, caramelize, stabilize, concretize*

c. Unaccusatives: *acclimatize, metastasize, naturalize, specialize*

d. Unergatives: *fraternized, harmonize, fantasize, sympathize*

Given that *-ize* can create verbs that have the different meanings above, it must mean that it can be the overt spell out three of the four verbalizing heads in Harley's (2009) assumed inventory, namely the eventive v_{DO}, v_{CAUSE}, or v_{BECOME}. Spelling out v_{CAUSE} or v_{BECOME} with particular roots or stems produces pure

causatives, pure unaccusatives, and causative-inchoative alternators. Spelling out v_{DO} produces unergative verbs. As shown above, *-ize* never produces stative verbs from a stem or root and hence it cannot spell out the stative verbalizer v_{BE}.

An issue arises, however, if it is assumed that *-ize* spells out eventive verbalizing heads and also introduces the external argument. Suppose now that the structure of a *v*P with produced by *-ize* can be represented as the structure below in bracketed notation. Here, *v* spelled out by *-ize* assigns accusative case to the subject of the small clause *verbs*.[4]

(2.30) Linguists nominalize verbs.
[$_{vP}$ Linguists *-ize*$_{v}$ [$_{aP}$ verbs [$_{a}$ *-al*$_{a}$ $\sqrt{\textit{nomin-}}$]]]

Crucially, Harley (2009) notes that *-ize* readily appears within nominalizations with the nominalizer *-ation*. Crucially though, the direct object of the nominalized verb appears with the prepositional case marker *of* parallel to an *of*$_{ing}$ nominal. This applies across all of the verbs that *-ize* produces, a sample of which I show below.

(2.31) The categorization of words, the crystallization of sugar, the naturalization of citizens, the harmonization of the singers

This thus leads to a sort of contradiction. That the sole argument appears with the prepositional case marker *of* suggests that the accusative case assigner, assumed to be *v*, is absent within the nominalization. However, since *-ize* is present within the nominalization, it must be that a verbalizer little *v* is also present. This

[4]Harley (2009) assumes the presence of an FP between *v*P and the small clause where the object moves to for accusative case checking. I simplify the representation and assume *v* directly assigns accusative case directly via some operation like AGREE that probes for the closest DP (Chomsky, 1995).

contradiction disappears if one assumes that the verbalizer is *not* the external argument introducer and accusative case assigner. In these cases with *-ize*, the nominalizer is attaching to a little *v*P that excludes the external argument introducer and as a result, the direct object lacks accusative case assigned by this functional head. Taking this head to be Kratzer's (1996) VOICE, Harley (2009) concludes that evidence from nominalization in English suggests that external arguments are introduced by VOICE and not be verbalizing little *v* heads.

2.4 Analysis

I have so far outlined previous proposals suggesting first of all that entailments of intentionality can either be encoded in a VOICE head in terms of the kind of thematic role it introduces, or via a particular flavor of little *v*, namely v_{DO}. There is also evidence from English nominalizations containing overt verbalizers that VOICE and little *v* must be separate. In this section, I present a series of arguments, both conceptual and empirical, that the intentionality requirement and lack of a subjectless presupposition of *murder*-type verbs must somehow be encoded within the roots of these verbs themselves. Based on that, I then spell out a syntax and semantics for these verbs that rely on specific interpretations of the VOICE and little *v* heads.

2.4.1 VOICE and a Flavorless *v* for *Murder*-type Verbs

We have now seen that *v* can be given different flavors semantically, expressing agentive, causation, change-of-state, and stative meanings (Harley, 1995, 2009; Cuervo, 2003; Beavers and Koontz-Garboden, 2020, a.o.). The key choice here for *murder*-type verbs is between v_{DO} and v_{CAUSE}, since they are transitive and non-stative. As Folli and Harley (2005) note without examining in detail, a simple way to account for the alternation between *kill* and *murder* observed in terms of

requirements on the external argument is to say that *murder*-type verbs involve v_{DO}, which takes a DP complement instead of a stative small clause complement. There are, however, at least two arguments against such an analysis, which I discuss here.

First, even if *murder*-type verbs involve a v_{DO} that requires its external argument introduced in VOICE to be animate and capable of volitionally carrying out the event, it remains mysterious why subjectless presuppositions are disallowed as shown in (2.16) and repeated below. Recall the denotation of VOICE introducing an AGENT thematic role is as in (2.7b), repeated below. If it combines with a v_{DO}P via EVENT IDENTIFICATION, it should predict a subjectless presupposition to be possible with *murder*-type verbs when *again* attaches to v_{DO}P, contrary to fact as shown previously in (2.16); I reproduce the examples below.

(2.32) $[\![\text{VOICE}]\!]$: λx.λe.AGENT(x)(e)

(2.33) a. CONTEXT: The treacherous knight stabbed the the king in the heart so he can take his throne as king. The king's loyal sorcerer brought him back to life. Before the king could track down the treacherous knight, one of his guards, also wanting to usurp the king, caught the king by surprise by stabbing him in his gut with a hidden dagger so...
The guard murdered / assassinated the king again.

b. CONTEXT: The cruel knights decided to kill the enemy soldiers they have captured from war. The king's sorcerer, aghast at their cruelty, brought the captured enemy soldiers back to life. After they were revived, the king's guards encountered the captive soldiers and wanting to protect the king, ...
The guards massacred / slaughtered the soldiers again.

Furthermore, transitive non-resultative activity verbs, which under Folli and

Harley's (2005) system should straightforwardly involve v_{DO}, readily permit subjectless presuppositions as shown in (2.9) from Bale (2007) and repeated below. As Bale (2007) proposed, subjectless presuppositions with these verbs arise from *again* attaching to the VP, which on the assumptions of DM adopted here corresponds to v_{DO}P.

(2.34) 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.

If *murder*-type verbs involve a v_{DO}, it would have to be a very different kind of v_{DO} from verbs like *hit* in that v_{DO}P is not available semantically for *again* to attach to; it is difficult to see how such a difference might arise in a principled way.

Second, it can be shown that *murder*-type verbs do in fact encode a result state and should therefore involve causative semantics instead of the agentive, activity semantics of v_{DO} (Folli and Harley, 2005). Beavers and Koontz-Garboden (2012, 2020), refining the original tests in Rappaport-Hovav and Levin (2010), develop a battery of diagnostics that target result entailments in verbs: denial of result, object deletion, and restricted resultatives. The first of these relates to the fact that result verbs encode scalar change, where the participant engages in an event such that at the end of the event the participant must have some altered degree of some property or value (Rappaport-Hovav and Levin, 2010). In Rappaport-Hovav and Levin (2010), this was diagnosed by denying the past participle form of the verb under question. Beavers and Koontz-Garboden (2020) note that not all result verbs encode a result named by the surface verb itself and propose a *something is different about x* diagnostic. The logic behind this diagnostic is that

since result verbs encode a scalar change in a participant such that it possesses some altered degree of a property, it should not permit continuation with *nothing is different about x*. This is shown in the contrast below with a result versus a non-result verb (examples from Ausensi, 2020, pp. 14).

(2.35) a. # Noah just broke the vase, but nothing is different about it.

b. Alex just hit the wall, but nothing is different about it.

In this regard, the diagnostics show that *murder*-type verbs encode a result state. Specifically, it encodes a result state of *being dead*, such that denying the state of death or asserting that *nothing is different about x* is unacceptable (Ausensi, 2020, pp. 14).[5]

(2.36) a. # The knight just murdered / assassinated the king, but he is not dead.

b. # The soldiers just massacred / slaughtered their enemies, but they are not dead.

(2.37) a. # The knight just murdered / assassinated the king, but nothing is different about him.

b. # The soldiers just massacred / slaughtered their enemies, but nothing is different about them.

The second diagnostic concerns object deletion. The intuition is that since result verbs encode the scalar change of a participant in an event, the participant must be overtly realized. That is, without realization of the participant of a result verb, it becomes impossible to express the result. As such, non-result verbs allow

[5]The following sentences involve the use of *just*, which Beavers and Koontz-Garboden (2012) note mitigates the possibility of reversing a change directly after the event. That is, there is a contrast between *The knight murdered the king, but he is not dead because the wizard revived him yesterday* and # *The knight just murdered the king, but he is not dead because the wizard revived him yesterday*.

for constructions preceded by *all last night* where an object is dropped or with *out*-prefixation where an internal argument of the verb is suppressed (Ahn, 2020). Result verbs, on the other hand, disallow both of these constructions (examples from Ausensi, 2020, pp. 14).

(2.38) a. John swept the floor.
b. All last night, John swept.
c. Cinderella outswept her sisters.

(2.39) a. John broke the vase.
b. * All last night, John broke.
c. * John outbroke the other vase-smashers.

Murder-type verbs behave straightforwardly like result verbs when it comes to the object deletion and *all last night* diagnostics, suggesting they encode a result state (Ausensi, 2020, pp. 16).

(2.40) * All last night, John murdered / assassinated / massacred / slaughtered / slew.

The final diagnostic involves resultative secondary predication. Here, the logic is that since result verbs encode a specific result, the range of possible resulative phrases these verbs permit is much more restricted, allowing only those that further specify the result state encoded by the verb and not those that are distinct. Non-result verbs that encode a manner of action on the other hand, permit a wide range of secondary result predication as well as non-selected objects and fake reflexives, as illustrated below (Ausensi, 2020, pp. 17).

(2.41) a. John wiped the table clean / dry / shiny / spotless.
b. John ran his shoes threadbare / ragged.
c. John laughed himself silly.

(2.42) a. * John broke the vase off the table / valueless.

b. * John broke his hands bloody.

c. * John broke himself silly.

d. John broke the vase into pieces / in half / open.

Again, *murder*-type verbs behave like result verbs; they do not permit resultative secondary predication even with explicit contexts that attempt to further specify the result state of *being dead* (adapted from Ausensi, 2020, pp. 18).

(2.43) a. CONTEXT: John killed a man by throwing the man into the cold waters of the ocean. The man died, his skin turning blue from the cold so...
* John murdered the man blue.

b. CONTEXT: The soldier secretly killed the king by violently beating up the king in his sleep so...
* The soldier assassinated the king black and blue.

c. CONTEXT: A group of dragons kills a bunch of soldiers, picking them up and tossing them against the castle walls so...
* The dragons massacred the soldiers into the castle walls.

d. CONTEXT: A group of dragons kills a bunch of soldiers, ripping them apart with their claws and leaving their corpses bloodied so...
* The dragons slaughtered the soldiers bloody.

As the diagnostics show, *murder*-type verbs encode a result state, which would be something like *being dead*. If so, it should involve causative semantics. One way to implement this is to analyze *murder*-type verbs on a par with verbs like *kill* in lexical decomposition accounts. Harley (2012a), for example, argues that *kill* can be analyzed as involving a v_{CAUSE} selecting a small clause stative complement headed by the acategorial root $\sqrt{\text{DIE}}$, as shown in the bracketed notation below.[6]

[6]It should be noted that a decompositional analysis for *kill* has been controversial at least since

(2.44) $[_{vP}$ CAUSE $[_{SC}\ x\ \sqrt{\text{DIE}}\ ]\ ]$

However, we run into the same issue with saying that *murder*-type verbs contain a v_{CAUSE} as was observed with v_{DO}, namely that *kill* allows for a subjectless presupposition as noted by Bale (2007) in (2.17) and repeated below, while *murder*-type verbs do not. This is, in fact, general; other lexical causatives such as the verb *open*, analyzed under a lexical decomposition account as involving CAUSE + $\sqrt{\text{OPEN}}$, similarly allows subjectless presuppositions as shown in (2.46).

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

(2.46) CONTEXT: Mary walked into a room with a window. She opened the window to allow some air in. After a while, she closed the window before leaving the room. Later, Frank walked into the room and wanting some air, he opened the window so...
✓ Frank opened the window again.

The crux of the issue is that under a tripartite verbal structure involving VOICE and either v_{CAUSE} or v_{DO}, subjectless presuppositions should always be permitted. This is expected if we adopt a semantics of v_{CAUSE} as laid out in Kratzer (2005), which I show below. While Hale and Keyser (1993) and Folli and Harley (2005) do not provide a semantics of v_{DO}, we can provide a simple semantics that simply specifies a doing event that takes a theme DP.[7] In both cases, upon combining

Fodor (1970), who argues against *kill* containing an embedded eventive component *to die*. Harley (2012a) argues that Fodor's (1970) objections disappear in DM if the component *to die* is in fact stative and represented by an acategorial root. I review these arguments in chapter 3 in regards to restitutive presuppositions with *again*.

[7] I assume here that the roots of unergative activity verbs like *run* and *dance* are interpreted as

with either a stative small clause complement or a DP internal argument, a type <*s*,*t*> constituent is produced, which can then serve as the semantic argument for *again*. Crucially, this constituent excludes the external argument introduced by VOICE and thus produces subjectless presuppositions (Bale, 2007).

(2.47) a. $[\![v_{\text{CAUSE}}]\!]$: $\lambda P_{<s,t>}.\lambda e.\exists e_s[\text{CAUSE}(e,e_s) \wedge P(e_s)]$

b. $[\![v_{\text{DO}}]\!]$: $\lambda x.\lambda e.\text{DO}(x,e)$

Given the lack of subjectless presuppositions with *murder*-type verbs, the conclusion here is that they cannot involve either eventive v_{DO} or v_{CAUSE}, and certainly not v_{BECOME} and v_{BE}, since they are transitive and non-stative verbs.

Since v_{DO} is the locus of intentionality in Folli and Harley's (2005) analysis, one might then wonder where intentionality is encoded with *murder*-type verbs. One way of accounting for this is to adopt Kratzer's (1996) view and say that the locus of intentionality is encoded in the AGENT thematic role in VOICE; that is, VOICE has the denotation in (2.32) and repeated below.

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

Effectively, however, if the AGENT thematic role must be introduced by VOICE, it should predict once again that *murder*-type verbs should permit subjectless presuppositions, since VOICE composes with *v*P via EVENT IDENTIFICATION, regardless of what flavor of little *v* we adopt.[8] The alternative would be for *v*P to

the theme of the doing event i.e. they are semantically interpreted like nominals, as first proposed by Hale and Keyser (1993). Informally, the interpretation of *John danced*, for example, can be paraphrased as *John did a dance*.

[8]One other option is to assume that VOICE syntactically and semantically introduces an external argument and is of type <*e*,<*s*,*t*>>, and that the *v*P of *murder*-type verbs is also of <*e*,<*s*,*t*>>, combining with VOICE via PREDICATE MODIFICATION. This would explain why *v*P is not available for *again* and thus lacks subjectless presuppositions. However, for *v*P to be of type <*e*,<*s*,*t*>> would effectively require there to be an unsaturated argument position that would, through

introduce an individual of type *e* that combines with VOICE via FUNCTION APPLICATION; however, this is clearly not the kind of semantic object a *v*P should be. It seems that in addition to *v* being 'flavorless', we require VOICE for *murder*-type verbs to also be devoid of the semantic content it is assumed to have or subjectless presuppositions are again predicted. Nonetheless, we can surmise that VOICE is present and introduces the external argument for *murder*-type verbs. As discussed by Harley (2009), nominalizations provide a diagnostic for the presence of external argument introducing VOICE. Nominalizations of *murder*-type roots, as shown below, can target a *v*P excluding VOICE and accusative case, requiring the internal argument of these verbs to be licensed by *of*.

(2.49) a. the murdering / assassinating of the king
b. the massacring / slaughtering of their enemies

Summarizing this section, *murder*-type verbs present a kind of dilemma for the postulation of an external argument introducing VOICE head as well as verbalizing little *v* heads introducing eventive meanings and imposing semantic restrictions on the external argument. In particular, the lack of subjectless presuppositions suggests that both VOICE and little *v* must be semantically inert and yet, repetitive presuppositions with *again* must contain both the agent argument in the assertion as well as the requirement that the agent carried out the event

PREDICATE MODIFICATION, be saturated by the DP introduced by VOICE. Presumably, this would be introduced by the root itself, similar to what I am proposing in that the root semantically introduces its external argument. This would, however, require both VOICE and the root to assign the same thematic interpretation to the external argument, thereby duplicating the thematic information carried by the external argument. I view this alternative as a variant of how to formally capture the observed facts rather than an argument against the proposed analysis where only the root introduces the external argument and assigns it its thematic interpretation, and adopt the proposed analysis here under the assumption that duplicating thematic interpretations for an argument is redundant (see however, Pylkkänen, 2002, who proposes such duplication for her analysis of low applicatives).

intentionally. I propose an analysis in the next section, crucially arguing that the observations here can be implemented if we assume that the root contains a representation of the external argument, entails intentionality, and introduces eventive meanings normally assumed to be introduced by verbalizing little v heads.

2.4.2 The Syntax-semantics Interface for *Murder*-type Verb Roots

Taking the observations of the previous section at face value, I propose instead that the intentionality requirement *murder*-type verbs impose on their external arguments is encoded directly in the root itself. In addition, the root also directly introduces the external argument as well as the eventive causation meaning that is assumed to be encoded within v_{CAUSE}. A lexical entry for *murder*-type verbs would be a predicate of states that encodes a result component of *being dead*, but also have eventive component (based on Beavers and Koontz-Garboden, 2012, 2020).[9]

(2.50) $[\![\sqrt{\text{MURDER}}\text{-type}]\!]$: $\lambda x.\lambda y.\lambda e_s[\text{DEAD}(x,e_s) \wedge \exists e'[\text{CAUSE}'(e',e_s)] \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{CAUSER}(y,v) \wedge \text{INTEND}(y)(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(y,v') \wedge \text{DEAD}(z,e'_s)])]]$

Several parts of this proposed lexical entry are worth noting. First, the lexical

[9] I abstract away from the encyclopedic differences between *murder*, *assassinate*, *massacre*, and *slaughter* in the discussion to follow, since I focus on these verbs as a class. Presumably, each of these verbs imposes some manner specification on how the causing event was carried out. This is shown below with *murder*, with the non-relevant parts abbreviated and assuming the predicate MURDER(v) corresponds to some encyclopedic description of murdering events, requiring human entities as its internal argument. Similar restrictions on plural entities could be captured the same way with *massacre* and *slaughter*.

(i) $[\![\sqrt{\text{MURDER}}]\!]$: ... $\forall v[\text{CAUSE}(v,e_s) \rightarrow \text{MURDER}(v) \wedge \text{CAUSER}(y,v) \wedge \text{INTEND}(y)(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{MURDER}(v') \wedge \text{CAUSER}(y,v') \wedge \text{DEAD}(z,e'_s)])]]$

entry entails that there was a causing event that caused the state of an entity being dead in the second conjunct. Second, the third conjunct states that for all events that caused the state of death, there is a causer argument which serves as the second argument to the root. In addition, there is a further condition on the causer argument, encoded by the modal INTEND relation. This relation requires that for all worlds pertaining to the causer's intentions, the causer causes an event that results in some entity's death, crucially not needing to be the entity the root takes as its holder argument. I omit world arguments here for perspicuity, and address the specific predictions in the next section.

Moving on to the syntax for now, note that the root is a predicate of states after combining with two entity arguments. Since it is a predicate of states and acategorial, we expect that it should still be verbalized by a little verbalizing v after it has combined with its holder argument, as is the analysis with lexical causatives like *open*. Nonetheless, if we combine it with a v_{CAUSE} with a denotation like that of Kratzer's (2005) in (2.47a), it would mistakenly predict a subjectless presupposition as observed with lexical causatives. Instead, I propose that when the root itself already contains eventive meaning usually introduced by a verbalizer, the verbalizing little v can be semantically inert. We can capture this using a spell out rule within the DM tradition, with the meaning of little v sensitive to the identity of the root it verbalizes (as noted by Merchant, 2019), i.e., the rule spells out different *allosemes of little v* (Wood, 2012; Myler, 2014; Wood and Marantz, 2017). I indicate the identity of roots using indices (Harley, 2014); in the presence of certain roots like *murder*-type roots, little v is interpreted as inert, semantically a type-neutral identity function that simply returns the denotation of its sister unchanged.

(2.51) $[\![v]\!] \rightarrow \lambda$F.F / ___ $\sqrt{\text{MURDER}}$-type / $\sqrt{\text{ROOT}}_{68}$ / $\sqrt{\text{ROOT}}_{143}$ ...

In addition, note that the root itself already introduces the external argument. Nonetheless, the previous section showed that accusative case assignment in

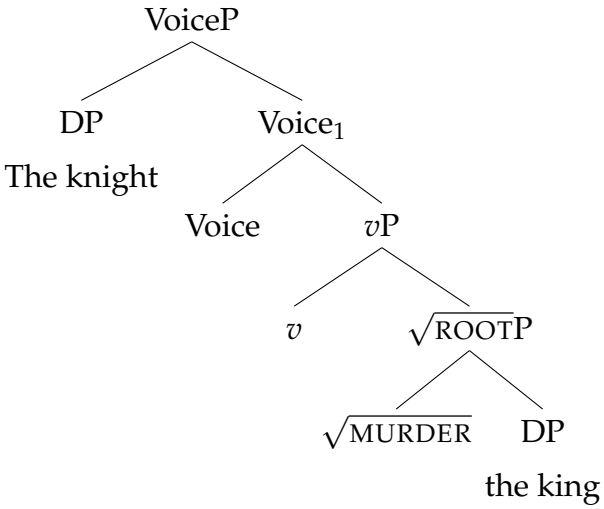
nominalizations still requires that an accusative case assigning and external argument introducing VOICE head be present. Following work by Schäfer (2008), Myler (2014), Alexiadou et al. (2015), and Wood and Marantz (2017), I suggest that accusative case assignment is tied to syntactic transitivity and not semantic transitivity. What this means is that there is a flavor of VOICE that introduces an argument syntactically in its specifier position, assigns accusative case to the root's internal argument, but does not assign a thematic role to this argument; rather, the argument is assigned a thematic role by some constituent lower down in the structure (Schäfer, 2008; Harley, 2013; Myler, 2014; Alexiadou et al., 2015; Wood and Marantz, 2017). This thematic role is unsaturated till VOICE is combined. This particular flavor of accusative case assigning but semantically expletive VOICE can be implemented if VOICE can be interpreted as a type-neutral identity function. In addition to VOICE being sensitive to the kinds of events it combines with (Wood, 2012; Myler, 2014; Wood and Marantz, 2017), it can also be sensitive to the identity of the root of the event it combines with; a spell out rule is given below, parallel to the spell out rule for little v in (2.51).

(2.52) $[\![\text{VOICE}]\!] \rightarrow \lambda\text{F.F} \;/\; \_\_\_ \; [_{vP} \sqrt{\text{MURDER}}\text{-type} \;/\; \sqrt{\text{ROOT}}_{68} \;/\; \sqrt{\text{ROOT}}_{143} \ldots]$

Putting everything together, the structure that a *murder*-type verb root is embedded in is given below, together with the corresponding semantic interpretations.[10]

(2.53) The knight murdered the king.

[10] I represent the result state constituent here as an $\sqrt{\text{ROOT}}$P, assuming that roots can take internal arguments as does Harley (2014). In chapter 3, however, I show evidence that with lexical causatives at least, there should be more structure involving a stative verbalizing v_{BE}. I omit this here as it is not crucial to the argumentation.



(2.54) a. $[\![\sqrt{\text{MURDER}}]\!]$:
$\lambda x.\lambda y.\lambda e_s[\text{DEAD}(x,e_s) \wedge \exists e'[\text{CAUSE}'(e',e_s)] \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{CAUSER}(y,v) \wedge \text{INTEND}(y)(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(y,v') \wedge \text{DEAD}(z,e'_s)])]]$

b. $[\![\sqrt{\text{ROOT}}\text{P}]\!]$:
$\lambda y.\lambda e_s[\text{DEAD}(\textit{the king},e_s) \wedge \exists e'[\text{CAUSE}'(e',e_s)] \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{CAUSER}(y,v) \wedge \text{INTEND}(y)(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(y,v') \wedge \text{DEAD}(z,e'_s)])]]$

c. $[\![v]\!]$: λF.F

d. $[\![v\text{P}]\!]$:
$\lambda y.\lambda e_s[\text{DEAD}(\textit{the king},e_s) \wedge \exists e'[\text{CAUSE}'(e',e_s)] \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{CAUSER}(y,v) \wedge \text{INTEND}(y)(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(y,v') \wedge \text{DEAD}(z,e'_s)])]]$

e. $[\![\text{VOICE}]\!]$: λF.F

f. $[\![\text{VOICE}_1]\!]$:
$\lambda y.\lambda e_s[\text{DEAD}(\textit{the king},e_s) \wedge \exists e'[\text{CAUSE}'(e',e_s)] \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{CAUSER}(y,v) \wedge \text{INTEND}(y)(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(y,v') \wedge \text{DEAD}(z,e'_s)])]]$

g. $[\![\text{VOICEP}]\!]$:
$\lambda e_s[\text{DEAD}(\textit{the king},e_s) \wedge \exists e'[\text{CAUSE}'(e',e_s)] \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{CAUSER}(\textit{the knight},v) \wedge \text{INTEND}(\textit{the knight})(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(\textit{the knight},v') \wedge \text{DEAD}(z,e'_s)])]]$

2.4.3 Predictions

The proposed lexical entry for a verb like *murder* immediately makes several desirable predictions, not least in regards to the observations with subjectless presuppositions. Recall that *again* is assumed to be of semantic type $<<s,t>,<s,t>>$, requiring a predicate of events as its first argument. Given the analysis in (2.53) and (2.54), the only site where *again* can attach to semantically is at VOICEP of type $<s,t>$. Crucially, the site where subjectless presuppositions are produced, namely at *v*P, is semantically not available as it is a function requiring an individual argument corresponding to the causer to produce a predicate of events. The causer argument of *murder* must therefore always be in *again*'s presupposition. In addition, because the root itself entails that any event causing the death of the holder argument must be intentionally carried out by the causer, the intentionality requirement will always be contained within *again*'s presupposition, producing the observations in (2.22), (2.23), and (2.24).

In addition to the original observations about subjectless presuppositions and intentionality, the analysis also makes a prediction about the possibility of restitutive presuppositions with *again*. As has been observed with lexical causatives, low attachment of *again*, specifically to the result state constituent that is verbalized by v_{CAUSE}, can produce restitutive presuppositions (von Stechow, 1996; Beck and Johnson, 2004; Bale, 2007; Harley, 2012a; Beavers and Koontz-Garboden, 2020, a.o.). Previewing the discussion in the next chapter, an example with a lexical causative like *open* is provided below. Decomposing a lexical causative into a CAUSE + result state constituent straightforwardly predicts such a presup-

position.

(2.55) Mary opened the door again.

a. Mary previously opened the door and she opened it again.
(*Repetitive*)

b. The door was previously open and Mary opened it again.
(*Restitutive*)

However, notice now that the lexical entry of *murder*-type roots, while being a predicate of a state of death, entails that there was some causing event that brought about the state, as indicated in (2.50). This predicts that there should be no restitutive presuppositions where there was previously a state of death and the asserted event restored this state, even if the root is a predicate of a state of death. This prediction is borne out; modification of verbs like *murder* with *again* does not permit a restitutive context. In the example below, the king dies of disease and was not murdered or killed. This forces an interpretation of *again*'s presupposition with *murder*, which must be carried out intentionally, as restitutive. Crucially, such a context is in fact unacceptable, which is predicted in the account above where there is no independent result state constituent that does not entail a causing event.

(2.56) CONTEXT: A king dies of disease. A wizard, wanting to prevent a mad rush for the throne, brings the king back to life. A treacherous knight who had always wanted to usurp the king attacked him and stabbed the king in the heart with his sword so...
The knight murdered the king again.

Finally, the lexical entry of *murder*-type roots contains a conjunct that differentiates the entity that is intended to be affected by the causer carrying out the causing event from the actual entity holding the result state. This is to allow for

contexts where the causer intends to affect an entity but affects another entity instead. The example below illustrates such a context.[11] Since *murder*-type verbs can be used in such contexts, it shows that the intention of the causer can affect an entity other than the one the causer intended to affect, as shown in (2.50).[12]

(2.57) CONTEXT: The soldier wanted to kill a dragon with a bow and arrow. But he is such a bad shot that he shot the arrow at the king instead of the dragon so...
✓ The soldier murdered the king by accident.

2.4.4 Dissociating Intentionality and Subjectless Presuppositions: Verbs of Stealing

The proposed analysis thus far suggested that some classes of roots can contain more semantic information than just their internal arguments. In particular, certain well-defined classes of roots contain representations of the external argument and an intentionality requirement on them. It then raises the question of whether

[11] I thank Jian Gang Ngui and an anonymous *Glossa* reviewer for raising the possibility of this 'mistaken identity' reading.

[12] While this 'mistaken identity' reading is readily available for *murder*, to my ear it does not seem readily available for all verbs in this class. For example, the exact same context involving verbs like *massacre* and *slaughter* sound degraded compared to *murder*.

(i) CONTEXT: The soldiers wanted to kill a band of dragons using a bow and arrow. But they are such bad shots that they shot their arrows at the villagers instead of the dragons so...
?? The soldiers massacred / slaughtered the villagers by accident.

If this contrast is robust, it might suggest that the lexical entry given in (2.50) might not be appropriate for all roots in this class and that for some roots, the entity that holds the result state within the INTEND relation must be the same entity as the one that holds the actual result state. Since I concentrate on these verbs as a class and illustrated this 'mistaken identity' reading with *murder*, I continue to use the lexical entry in (2.50) and set this possible variation aside.

these meaning components must be bundled together and also what other kinds of semantic information roots can contain. Intuitively, it would make sense if whenever a root entails intentionality, it should also have a representation of an external argument, since intentionality formalized as a modal relation needs to access the worlds compatible with an individual argument's intentions.[13] If so, we expect modification with *again* to always contain the external argument and the intentionality requirement within its presupposition. This was seen with *murder*-type verbs, where *again*'s presupposed prior event must be carried out by the same causer intentionally.

However, it seems that this expectation is not borne out. One particular class of verbs where the intentionality requirement and presence of an external argument come apart is with verbs of stealing that consist of verbs like *steal*, *snatch*, and *seize*. Descriptively and pre-theoretically, these are verbs where the subject carries out an action of acquiring the object either for themselves or for some other entity in some manner specified by the lexical meaning of the verb. As shown below, verbs of stealing disallow inanimate causer arguments and entail intentionality, resisting modification that cancels or reinforces the intent of the subject like *unintentionally*, *by accident*, *intentionally*, and *on purpose*. (Ausensi, 2020, pp. 25-27).[14]

(2.58) # A gust of wind / # The truck stole / snatched / seized the money.

(2.59) a. # The thief stole / snatched / seized the money unintentionally / by accident.

b. # The thief stole / snatched / seized the money intentionally / on purpose.

[13] I thank Ryan Walter Smith (personal communication) for discussion of this point.

[14] Again, these verbs seem to allow for a 'mistakenly stolen' reading with *unintentionally* and *by accident*, where the subject intended to steal something else other than the referent denoted by the object. This will be factored into the proposed analysis in a similar way to *murder*-type verbs.

Given the observations with *murder*-type verbs, we might expect then that these stealing verbs should also introduce their external arguments internal to the verb root and disallow subjectless presuppositions. This is, however, not borne out. As shown below, these verbs readily allow subjectless presuppositions as in (2.60).

(2.60) CONTEXT: John stole / snatched / seized some money from a bank by force. Before he could escape, he was arrested by the police, who returned the money to the bank and left to bring John to the police station. Mary, seeing that the police are now gone, went into the bank and took the money by force so...
✓ Mary stole / snatched / seized the money again.

This suggests that intentionality and the presence of an external argument need not necessarily be contained within a single constituent like a root. Translated into present assumptions, the fact that a subjectless presupposition is allowed necessitates that the external argument must be truly external to the verb's meaning, structurally introduced outside of the *v*P by VOICE such that *again* can attach to the *v*P and produce a subjectless presupposition. Importantly, it also means that VOICE cannot introduce the intentionality requirement, since the presupposed event carried out by a different entity must also be intentional. If VOICE imposes the intentionality requirement, then it should be expected that verbs of stealing should allow a presupposed prior event that is carried out unintentionally when *again* attaches to *v*P; as shown in and (2.58) and 2.59), this is generally impossible.

Similar to *murder*-type verbs, we can confirm that verbs of stealing encode a result state, necessitating causative semantics. As Ausensi (2020) shows, verbs of stealing pass the result diagnostics as proposed by Rappaport-Hovav and Levin (2010) and Beavers and Koontz-Garboden (2012, 2020) described in an earlier section: denial of change, object deletion, and restricted resultatives. In particular, the first diagnostic of denying the result state shows that the relevant result state

encoded by these verbs is a change-of-possession, as shown by the *x gets something* diagnostic (Ausensi, 2020, pp. 26-27), as noted by Levin (1993).

(2.61) # The thief stole / snatched / seized a luxury watch, but he didn't get it.

(2.62) # All last night, the thief stole / snatched / seized.

(2.63) a. # The thief stole / snatched / seized the money empty.
b. # The thief stole / snatched / seized his hands dirty.

On the other hand, similar to *murder*-type verbs, verbs of stealing, even if they neccesitate causative semantics, do not have a syntactically available constituent encoding a result state for *again* to attach. In other words, they also disallow restitutive presuppositions where what is presupposed by *again* is a prior state of the surface subject possessing something, as shown below (examples from Ryan Walter Smith, personal communication).

(2.64) CONTEXT: Frank had a scarf, but he gave it to a friend. He suddenly realized he really liked the scarf, but did not want to hurt his friend's feelings by asking for it back. So one night, Frank broke into his friend's home and...
Frank stole the scarf again.

(2.65) CONTEXT: The FBI had in their possession a large amount of money. A band of thieves stole the money from the FBI. The FBI sent their agents to intercept the thieves and arrested all of them. After that...
The FBI seized the money again.

(2.66) CONTEXT: Mary owned a priceless gem that had been in her family for generations. She dropped it, only to later find a young boy holding it later. Mary has no patience with children, so, walking up to the boy...
Mary snatched the gem again.

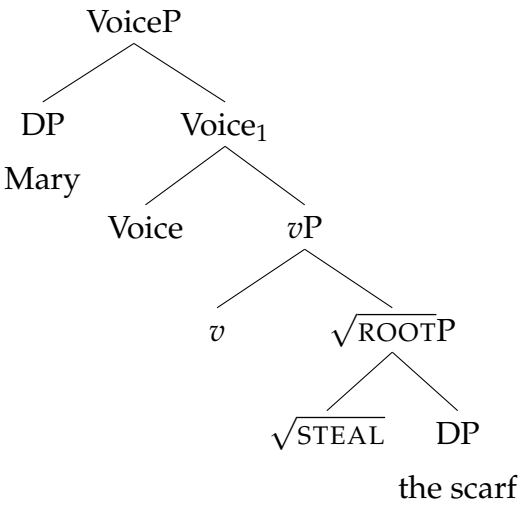
In particular, we can confirm that the only presuppositions available with *again* must necessarily be repetitive. This can be forced by using a context where the manner of causing the surface subject to come into possession of the surface object is different from the assertion, similar to (2.56) and which rules out a repetitive presupposition. Here, I use a verb of transaction like *buy*. If there is indeed a restitutive presupposition targeting a result state constituent that is always entailed by a repetitive context, it should predict that such a context should be acceptable with verbs of stealing modified with *again*. As shown below, this is clearly unacceptable, suggesting that there is no such independent constituent available for *again* to attach and produce a restitutive presupposition and that the manner component of the causing event must always fall within the scope of *again*'s presupposition.

(2.67) CONTEXT: Mary bought a scarf, but she gave it to a friend. After giving it away, she realized she really liked the scarf and wanted it back, but not wanting to hurt her friend's feelings by asking for it back, she snuck into her friend's house one night and...
Mary stole the scarf again.

Given the above discussion, we are now ready to provide an initial analysis for the root meanings of verbs of stealing like *steal*, *seize*, and *snatch*. The root of verbs of stealing, parallel to *murder*-type verbs, will be a predicate of states denoting the surface subject's possession of the surface object. However, this result state constituent is not independently available for *again* to attach and produce restitutive presuppositions. Rather, much like *murder*-type verbs, these states entail the existence of an intentional causing event that caused the state of possession, but differ in that the causer is not taken as a semantic argument by the root. The causer argument is therefore introduced outside of the vP formed by the root together with little v. Importantly, the holder of the result state of possession

is the same as the external argument introduced by VOICE. I represent this using the Neo-Davidsonian representation of a thematic role, which is a function of type <*s*,*e*> that takes an event and returns the unique individual related to the event via that role (Carlson, 1998; Landman, 2000; Champollion, 2010, a.o.), which in this case would be CAUSER(e').[15] [16]

(2.68) Mary stole the scarf.



(2.69) a. $[\![\sqrt{\text{STEAL}}]\!]$:
$\lambda y.\lambda e_s[\exists e'[\text{CAUSE}(e',e_s)] \wedge \text{HAVE}(\text{CAUSER}(e'),y,e_s) \wedge$
$\forall v[\text{CAUSE}(v,e_s) \rightarrow \text{INTEND}(\text{CAUSER}(e'))(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s)$
$\wedge \text{CAUSER}(\text{CAUSER}(e'),v') \wedge \text{HAVE}(\text{CAUSER}(e'),z,e'_s)])]]$

[15] Again, I abstract away from the encyclopedic difference between verbs in this class. These can be represented as a condition on all causing events as being of stealing, seizing, or snatching events, parallel to the *murder*-type verbs. See footnote 9 for the formal representation.

[16] Note that I use two different representations of the thematic role CAUSER. One is a function of type <*s*,*e*>, while the other is a relation between an event and an individual CAUSER(x,e). This is purely for convenience and perspicuity, since it reduces the length of the logical translations. CAUSER(x,e) in the following formulas can be rewritten as CAUSER(e) = x. I believe nothing crucial in regards to the specific empirical predictions made hinges on this, and will continue to do so to make the formulas more readable.

b. $[\![\sqrt{\text{ROOT}}\text{P}]\!]$:
$\lambda e_s[\exists e'[\text{CAUSE}(e',e_s)] \wedge \text{HAVE}(\text{CAUSER}(e'),\textit{the scarf},e_s) \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{INTEND}(\text{CAUSER}(e'))(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(\text{CAUSER}(e'),v') \wedge \text{HAVE}(\text{CAUSER}(e'),z,e'_s)])]]$

c. $[\![v]\!]$: $\lambda P_{s,t}.\lambda e.\exists e_s[\text{CAUSE}(e,e_s) \wedge P(e_s)]$

d. $[\![v\text{P}]\!]$:
$\lambda e \exists e_s[\text{CAUSE}(e,e_s) \wedge \exists e'[\text{CAUSE}(e',e_s)] \wedge \text{HAVE}(\text{CAUSER}(e'),\textit{the scarf},e_s) \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{INTEND}(\text{CAUSER}(e'))(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(\text{CAUSER}(e'),v') \wedge \text{HAVE}(\text{CAUSER}(e'),z,e'_s)])]]$

e. $[\![\text{VOICE}]\!]$: $\lambda x.\lambda e.\text{CAUSER}(x,e)$

f. $[\![\text{VOICE}_1]\!]$:
$\lambda x.\lambda e.\exists e_s[\text{CAUSER}(x,e) \wedge \text{CAUSE}(e,e_s) \wedge \exists e'[\text{CAUSE}(e',e_s)] \wedge \text{HAVE}(\text{CAUSER}(e'),\textit{the scarf},e_s) \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{INTEND}(\text{CAUSER}(e'))(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(\text{CAUSER}(e'),v') \wedge \text{HAVE}(\text{CAUSER}(e'),z,e'_s)])]]$

g. $[\![\text{VOICE}\text{P}]\!]$:
$\lambda x.\lambda e.\exists e_s[\text{CAUSER}(\textit{mary},e) \wedge \text{CAUSE}(e,e_s) \wedge \exists e'[\text{CAUSE}(e',e_s)] \wedge \text{HAVE}(\text{CAUSER}(e'),\textit{the scarf},e_s) \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{INTEND}(\text{CAUSER}(e'))(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(\text{CAUSER}(e'),v') \wedge \text{HAVE}(\text{CAUSER}(e'),z,e'_s)])]]$

Note here that the root entails the existence of a causing event, whose causer is the possessor of the surface DP object the root takes as its argument. The root itself does not introduce the causer external argument; rather, the external argument and the actual causing event are introduced structurally through VOICE and v. This is different from *murder*-type verbs, where both VOICE and v are interpreted expletively. It is necessary with verbs of stealing that these two functional heads are not interpreted expletively (Schäfer, 2008; Wood, 2012; Myler,

2014; Alexiadou et al., 2015; Wood and Marantz, 2017). First, the root does not take its external argument as a semantic argument and does not assign a semantic role to it. As such, VOICE must both syntactically introduce the argument and also assign it a semantic role, necessitating it to not be interpreted expletively. Second, little *v* here must also be interpreted as introducing causative semantics because the root would be a predicate of states once it combines with the DP it takes as a sole semantic argument interpreted semantically as a possessee. If *v* were to be interpreted expletively, $\sqrt{\text{ROOT}}$P, being a stative constutent of type <*s*,*t*>, could combine with VOICE via EVENT IDENTIFICATION. However, this would mean the CAUSER role assigned by VOICE would be related with the state denoted by $\sqrt{\text{ROOT}}$P instead of the causing event. This would not be desirable, since a CAUSER role relates an individual to a causing event rather than a state. On the other hand, interpreting little *v* as introducing a causative event would derive the right interpretation when VOICE combines with *v*P.

Because *v* is interpreted as introducing causative semantics, *v*P will be the correct kind of constituent for *again* to attach, producing a presupposition that makes reference to the causer of an event but does not require the causer to be the same as the one introduced by VOICE, producing the subjectless presupposition observed in (2.60). Furthermore, the root itself introduces the intentionality requirement as does *murder*-type verbs. As a result, these verbs entail intentionality as shown in (2.58) and (2.59), and regardless of where *again* attaches, it will always require a presupposed prior event that must be carried out intentionally.

While the analysis given above is consistent with the assumptions adopted so far, with different flavors of little *v* and a subjectless presupposition predicted when *v* is interpreted as introducing CAUSE, there is reason to believe that this is still not quite the correct analysis. To see why, consider the case where *again* produces a subjectless presupposition with verbs of this class, as shown previously in (2.60) and repeated here.

(2.70) CONTEXT: John stole / snatched / seized some money from a bank by force. Before he could escape, he was arrested by the police, who returned the money to the bank and left to bring John to the police station. Mary, seeing that the police are now gone, went into the bank and took the money by force so...
✓ Mary stole / snatched / seized the money again.

The crucial element about the context which allows for a subjectless presupposition with these verbs is that *the state of possession must no longer hold in an intermediate temporal interval between the presupposed and asserted event*. That is, in the above example, John must have lost possession of the money he obtained in the temporal interval before the asserted event of Mary stealing the money again. This can be confirmed by modifying the above context such that the stealer/seizer/snatcher did not lose the money in an intermediate temporal interval, and in the assertion a different stealer/seizer/snatcher obtained the money. As shown below, the asserted sentence is unacceptable in this context.

(2.71) CONTEXT: John stole / snatched / seized some money from a bank by force. He escaped from the police and arrived in a small town to rest in a hotel. Mary, envious of John's newfound wealth, saw that John was tired from his escape and snuck into John's room and...
Mary stole / snatched / seized the money again.

To see why this is a problem, consider the analysis presented in (2.68) and (2.69) for *steal*. As noted, the guiding assumption here is that subjectless presuppositions are produced when *v*P excluding VOICE is available as an attachment site for *again*. Given the formulation of *again*'s presupposition, which I repeat below for convenience, the presupposition produced by attaching *again* to *v*P in (2.69d) is shown below. Note that I show only the negated event in the intermediate temporal interval, which is most relevant to the discussion to come.

(2.72) $[\![\text{again}]\!]$: $\lambda P_{<s,t>}.\lambda e.P(e)$
PRESUPPOSITION: $\exists e^1 \exists e^2 [e^1 \prec e^2 \prec e \wedge P(e^1) \wedge \neg P(e^2)]$

(2.73) a. $[\![vP]\!]$:
$\lambda e \exists e_s[\text{CAUSE}(e,e_s) \wedge \exists e'[\text{CAUSE}(e',e_s)] \wedge \text{HAVE}(\text{CAUSER}(e'),\textit{the money},e_s) \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{INTEND}(\text{CAUSER}(e'))(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(\text{CAUSER}(e'),v') \wedge \text{HAVE}(\text{CAUSER}(e'),z,e'_s)])]]$

b. PRESUPPOSITION: ... $\neg \exists e_s[\text{CAUSE}(e^2,e_s) \wedge \exists e'[\text{CAUSE}(e',e_s)] \wedge \text{HAVE}(\text{CAUSER}(e'),\textit{the money},e_s) \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{INTEND}(\text{CAUSER}(e'))(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(\text{CAUSER}(e'),v') \wedge \text{HAVE}(\text{CAUSER}(e'),z,e'_s)])]]$

As evident in the presupposition, what is presupposed here is there does not exist a state of having that is intentionally caused in an intermediate temporal interval between a previous stealing event and the asserted one. That is, the variable e^2 in *again*'s presupposition is being fed to an *eventive* CAUSE relation rather than the stative HAVE relation, which has already been existentially bound when combined with CAUSE. Presupposing there is no state of having caused by an event in an intermediate temporal interval is in fact compatible with a context where the stealer does not lose possession of whatever it is that the stealer stole, since in this temporal interval nothing causes this having state. Simply having no stealing event between the presupposed and prior event would be sufficient to satisfy this condition, meaning that the example in (2.71) should in fact be acceptable when it is not. If anything, the contrast between (2.70) and (2.71), where the state of having must be reversed, shows that the relevant attachment site for *again* to produce a subjectless repetitive presupposition should be $\sqrt{\text{ROOT}}$P in (2.69b), which is a predicate of states of having. Attaching here would produce the relevant presupposition where the state of having must be reversed as in (2.70).

(2.74) a. $[\![\sqrt{\text{ROOT}}\text{P}]\!]$:
$\lambda e_s[\exists e'[\text{CAUSE}(e',e_s)] \wedge \text{HAVE}(\text{CAUSER}(e'),\textit{the money},e_s) \wedge \forall v[\text{CAUSE}(v,e_s) \rightarrow \text{INTEND}(\text{CAUSER}(e'))(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(\text{CAUSER}(e'),v') \wedge \text{HAVE}(\text{CAUSER}(e'),z,e'_s)])]]$

b. PRESUPPOSITION: ... $\neg [\exists e'[\text{CAUSE}(e',e^2_s)] \wedge \text{HAVE}(\text{CAUSER}(e'),\textit{the money},e^2_s) \wedge \forall v[\text{CAUSE}(v,e^2_s) \rightarrow \text{INTEND}(\text{CAUSER}(e'))(\exists z \exists v' \exists e'_s[\text{CAUSE}(v',e'_s) \wedge \text{CAUSER}(\text{CAUSER}(e'),v') \wedge \text{HAVE}(\text{CAUSER}(e'),z,e'_s)])]]$

That examples like (2.71) with a subjectless presupposition must be derived by *again* attaching directly to the root denoting a predicate of states rather than attaching high to *v*P instead suggests that the *v*P is in fact not available for verbs of stealing as compared to *murder*-type verbs, where both little *v* and VOICE are interpreted expletively. However, because the external argument is not introduced by the root itself and must be introduced and assigned its thematic interpretation by VOICE, it necessitates the introduction of a causing event structurally. This is so that the thematic interpretation of a CAUSER role by VOICE would relate the external argument to a causing event introduced by little *v* rather than the predicate of states denoted by the root, as discussed previously. *Murder*-type verbs did not require a causing event introduced structurally as they directly introduced and assigned a thematic interpretation to their causer arguments within the root. This creates a kind of paradox for verbs of stealing, since *v*P should be available as an attachment site for *again* but this overgenerates, predicting (2.71) to be acceptable.

One way of resolving this paradox is to assume that in English, VOICE and *v* introducing CAUSE can be bundled together into a single head (Pylkkänen, 2002; Pylkkänen, 2008).[17] Putting aside how exactly the denotations of little V and VOICE introducing a CAUSER role would compose, which Pylkkänen (2002)

[17]I thank Ryan Walter Smith (personal communication) for first pointing out the possibility of bundling VOICE and little *v* to derive this observation.

assumes apply stepwise as if there are two heads, this would mean that semantically, there is only one other attachment site for *again* to attach to with verbs of stealing other than $\sqrt{\text{ROOT}}$P, namely at VOICEP.[18] Crucially, a subjectless presupposition is produced when *again* attaches to $\sqrt{\text{ROOT}}$P, which is a predicate of states. This produces a subjectless presupposition where the presupposed state *must be negated in an intermediate temporal interval*, producing the contrast between (2.70) and (2.71). Because VOICE and little *v* are bundled together, there is no independent *eventive* constituent *again* can attach to excluding the external argument, ruling out (2.71). Attaching to VOICEP would produce an eventive presupposition where the causer is identical across the presupposed and asserted event, which I set aside here.

While bundling VOICE and little *v* can possibly derive the facts with verbs of stealing, it raises questions of why particular root classes can condition certain aspects of their structure to compose in specific ways. In particular, if we assume that VOICE and little *v* can be bundled for verbs of stealing, we run into the kinds of issues discussed for nominalizations of verbs that are themselves verbalized using overt verbalizers. If we accept Harley's (2009) arguments for the distinctness of VOICE and little *v* as being distinct heads syntactically and that only VOICE is the locus of accusative case assignment, the fact that *-ing* nominals of verbs of stealing can appear with *of*-marked internal arguments suggests that

[18] Apart from simply assuming a semantic composition which applies stepwise semantically but in a single syntactic head as does Pylkkänen (2002), one other way of combining the denotations of little *v* introducing CAUSE and VOICE would be to use the rule of function composition. This would first combine the output of supplying little *v*'s first argument with the denotation of VOICE via EVENT IDENTIFICATION, producing a function that takes a predicate of events as its first argument (the result state constituent), and then an individual argument (the external argument) as its second, and returning a predicate of events (Ryan Walter Smith, personal communication). I leave the formal details and implications of such a special function composition rule for future work.

the accusative case marking VOICE head is absent.

(2.75) John's stealing / seizing / snatching of the money from the bank

However, if VOICE and little *v* must be bundled for verbs of stealing, then the *-ing* nominals with *of* formed from these verbs would actually not be formed from verbs at all, since the stem to which the nominalizing *-ing* would actually not contain VOICE/*v*. This would be counter-intuitive, since distributional restrictions of nominalizing *-ing* would now have to be stated differently for verbs of stealing as a class. While there are technical solutions to capturing the facts observed with verbs of stealing and *again* attachment and the interpretations of its presupposition, namely bundling VOICE and little *v*, it remains to be seen if this is a desirable solution without leading to ramifications elsewhere in other morphosyntactic phenomena within English. I will leave this issue open here for further inquiry.

2.5 Implications: The Division of Labor Between Structure and Roots

This chapter began by assuming a particular view of the syntactic derivation, which is that little *v* heads encode various kinds of eventive meanings while roots provide encyclopedic content related to real world knowledge about different kinds of events. Other functional heads like VOICE introduced external arguments. Such a view has led to theoretical hypotheses regarding the semantic content that structural templates and roots can contain. In this section, I review some of these claims, showing how the analysis for *murder*-type verbs and verbs of stealing argue against such hypotheses. I then outline briefly another example where roots can monotonically entail or strengthen the semantic entailments of a particular structural template, namely ditransitive verb templates. Overall, this would lend further support to the view that roots can in fact contain more

than just encyclopedic content but also meanings traditionally associated with particular bits of syntactic structure.

2.5.1 Manner-result Complementarity and Bifurcation: Rappaport-Hovav and Levin (2010) and Embick (2009)

What lexical-semantic entailments verbs or lexical semantic roots can contain has been a recurrent question at least since works like Dowty (1979). Grimshaw (2005), for example, claims that there is in principle no restrictions in terms of the complexity of possible verb meanings; for example, one could imagine a verb *smolt*, which encodes the pulverizing of something, mixing it with molten plastic, allowing it to harden, and then encasing it in steel. Rappaport-Hovav and Levin (2010), on the other hand, hypothesize such verbs are impossible. They note that eventive verbs in general can be broadly divided into two classes: manner verbs and result verbs. Manner verbs encode the manner in which some action is carried out while result verbs encodes the coming about of a particular result state (Beavers and Koontz-Garboden, 2012, pp. 332).

(2.76) a. Manner verbs: *blink, jog, run, scrub, sweep, swim, walk, wipe, yell*

b. Result verbs: *break, clean, crush, destroy, dim, shatter*

Crucially, Rappaport-Hovav and Levin (2010) propose that no single verb can encode both meanings at the same time. Result verbs never encode a particular manner in which the result state encoded comes about. For example, the state of being clean can come about in any number of different manners like washing, wiping, mopping etc. On the other hand, the result state for manner verbs is also unspecified. Hence, running can lead to being tired, being in a particular place, or one can simply be running around in circles. While two separate lexical semantic roots can encode manner and result separately (*wipe the table clean*), a single, monomorphemic verb never encodes both simultaneously. Manner and

result meanings are therefore argued to be in complementary distribution, formulated in their well-known MANNER-RESULT COMPLEMENTARITY generalization (Rappaport-Hovav and Levin, 2013, pp. 50)

(2.77) MANNER/RESULT COMPLEMENTARITY: Manner and result meaning components are in complementary distribution: a verb lexicalizes only one.

For Rappaport-Hovav and Levin (2010), this complementarity falls out from how event structures are composed. Adopting the architecture of event structures from Rappaport-Hovav and Levin (1998), the claim is that complementarity follows because lexical semantic roots can be inserted into event structural templates in one of two positions: either as a modifier of an ACT predicate, or as the argument of a BECOME predicate, and never the two different positions at the same time (schematic representation from Beavers and Koontz-Garboden, 2012, pp. 333).

(2.78) a. [x $\text{ACT}_{<\text{ROOT}>}$]

b. [[x ACT] CAUSE [y BECOME <ROOT>]]

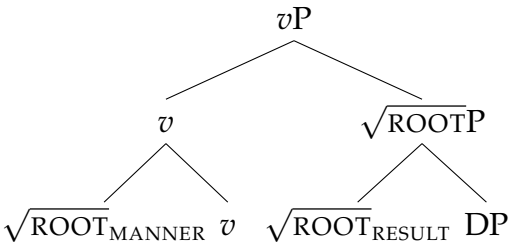
c. *[[x $\text{ACT}_{<\text{ROOT}>}$] CAUSE [y BECOME <ROOT>]]

d. *[[x $\text{ACT}_{<\text{ROOT}_1>}$] CAUSE [y BECOME $<\text{ROOT}_2>$]] (in a single verb)

As Beavers and Koontz-Garboden (2020) note, Rappaport-Hovav and Levin's (1998) event structure templates have often been taken to be represented explicitly in the syntactic structure within decompositional theories of verb meanings (e.g. Pylkkänen, 2002; Harley, 2005; Embick, 2004, 2009). In particular, in theories like Harley's (2005) and Embick's (2009), result verbs are formed from roots that serving as arguments to a verbalizing little v introducing eventive meanings, while manner verbs are formed from roots that modify an eventive little v that takes a DP or result state argument as an adjunct, corresponding directly to

Rappaport-Hovav and Levin (1998). The following structure illustrates (Embick, 2009).

(2.79)



In connection to MANNER-RESULT COMPLEMENTARITY and the possible positions where lexical semantic roots can be inserted in the structure in (2.79), Embick (2009) similarly proposes a constraint on what kinds of semantic information can be carried by roots, termed the BIFURCATION THESIS.

(2.80) BIFURCATION THESIS FOR ROOTS (BT-R): If a component of meaning is introduced by a semantic rule that applies to elements in combination, then that component of meaning cannot be a part of the meaning of a root.

Assuming that functonal heads like little v and VOICE structurally introduce eventive meanings like CAUSE or BECOME and external arguments interpreted as agents or causers, Embick's (2009) thesis means that roots cannot contain these kinds of meanings based on the position in which they are inserted in the structure. First, note that if VOICE introduces external arguments via secondary predication in combination with the vP, under the BT-R neither roots that are interpreted as manner nor those that are interpreted as result should lexically entail the external argument. Second, Embick (2009) also suggests that if a root is inserted as a complement of little v and thus interpreted as result, it cannot lexically entail causative semantics, since the causative semantics is introduced by functional heads like v. Conversely, if a root is inserted as a modifier of v and interpreted as a manner root, then it should not contain a result meaning interpreted

as a predicate of states. Manner roots must then be predicates of events while result roots must be predicates of states. Results roots combine with a structurally introduced CAUSE or BECOME relation as their arguments via FUNCTION APPLICATION (Kratzer, 2005), while manner roots modify eventive little v heads via PREDICATE MODIFICATION (Harley, 2005, 2012a).

(2.81) a. Manner roots: $\lambda e.\sqrt{\text{ROOT}}(e)$

b. Result roots: $\lambda x.\lambda e_s.\sqrt{\text{ROOT}}(x,e_s)$

As we have seen in the analysis presented earlier for *murder*-type verbs and verbs of stealing, both Rappaport-Hovav and Levin's (2010) and Embick's (2009) proposed constraints on verb meanings are too strong. The lack of both a subjectless presupposition and restitutive presupposition for *murder*-type verbs as outlined earlier led to the conclusion that the structural meaning normally encoded by v, namely CAUSE, should be encoded within the root itself. Moreover, I argued that these roots should also lexically entail the presence of an external argument in order to capture the constellation of facts when modified by *again*. To implement these observations compositionally, I arrived at the conclusion that with *murder*-type verbs, functional heads like v and VOICE are instead devoid of any meanings, with the meaning for the entire structure introduced solely by the root.

Verbs of stealing behaved similarly as *murder*-type verbs, with the only difference being the lack of a lexical entailment of external arguments leading to the possibility of subjectless presuppositions. Since the external argument must be introduced outside of the root and its internal argument, it led to the conclusion that if one takes the principle of compositionality seriously, verbs of stealing in fact contain roots that lexically entail the meaning introduced by the structural template, namely CAUSE, while being embedded within a structure that also compositionally introduces these structural meanings. To maintain Embick's (2009)

BF-T, one would need to grapple with these facts with *again*-modification. In fact, authors like Beavers and Koontz-Garboden (2020, 2012) and Ausensi (2020), based on sub-lexical modification with modifiers including *again*, explicitly reject the BF-T, arguing as I do here that roots can contain structural meanings like CAUSE.

In addition to the BF-T, it can be shown as well that Rappaport-Hovav and Levin's (2010) claim about the possible lexical semantic entailments between manner and result for roots is also too strong. In other words, some classes of roots can be shown to behave both like manner and result verbs with respect to the manner versus result diagnostics (Beavers and Koontz-Garboden, 2012, 2020; Ausensi, 2020). I have already discussed how *murder*-type verbs and verbs of stealing behave like result roots based on result diagnostics. As it turns out, these roots also behave like manner verbs based on manner diagnostics. Again, developing the diagnostics in Rappaport-Hovav and Levin (2010), Beavers and Koontz-Garboden (2012, 2020) propose three tests for manner entailments. Manner verbs involve non-scalar changes, such that there is a sequence of separate changes that collectively define an action but do not add up to a single cumulative change along some scale (Beavers and Koontz-Garboden, 2020, pp. 43). A prototypical manner of action then involves an 'actor' such that moving of some part of the actor's body brings about the action described by a manner verb. In this regard, manner verbs can place selectional restrictions on their subjects to be animate entities capable of volitionally carrying out the action described by the verb. We have already seen that this is the case with *murder*-type verbs and verbs of stealing, which entail intentionality and condition their subjects to be animate entities (Folli and Harley, 2005; Ausensi, 2020; Ausensi, Yu, and Smith, 2020c, a.o.). I repeat the examples below, involving the presence of an inanimate entity as the subject of these verbs.

(2.82) a. The soldiers murdered / assassinated / massacred / slaughtered

their enemies.

b. # The explosion / # The storm / # The magical sword murdered / assassinated / massacred / slaughtered their enemies.

(2.83) # A gust of wind stole / # The truck snatched / seized the money.

Furthermore, if manner verbs entail that their subjects must be animate actors, it will be impossible to assert that the actor carried out the action but did not *move a muscle*, such as in negligence contexts that involve the subject negligently failing to prevent the result state of *murder*-type verbs and verbs of stealing from coming to hold (Beavers and Koontz-Garboden, 2020, pp. 343). Both *murder*-type verbs and verbs of stealing do not permit continuation with *didn't move a muscle* in such negligent contexts (examples from Ausensi, 2020).[19]

(2.84) a. # John murdered Tom, his son, but didn't move a muscle – rather, he did not give consent to the operation on his tumor due to religious beliefs.

b. # That knight assassinated the king, but didn't move a muscle – rather, he didn't deliver the medicine that the sick king needed.

c. # The soldiers massacred all their enemies, but didn't move a muscle – rather, they refused to provide food and water while they were held captive.

d. # The knights slaughtered all the dragons they were training, but didnt move a muscle rather, they simply forgot to feed them.

[19] As Ausensi (2020) notes, *murder*-type verbs contrast with verbs like *kill*, which readily allows such contexts, supporting proposals that it is built from a pure result state root like $\sqrt{\text{DIE}}$ (e.g. Harley, 2012a) that does not entail a complex change that is characteristic of manner verbs.

(i) John killed Tom, his son, but didn't move a muscle – rather, he did not give consent to the operation on his tumor due to religious beliefs.

(2.85) a. # Bill stole the priceless gem, but didnt move a muscle - rather, his subordinates snuck into the museum and stole it for him while he tacitly watched.

b. # John seized the car, but didnt move a muscle - rather, Frank drove the car to his garage while John sat and waited.

c. # Mary snatched this luxury watch, but didnt move a muscle – rather, her husband Bill took it by force from its owner for her while she sat at her seat and watched.

Finally, because manner verbs involve non-scalar changes that are complex, manner verbs should be durative and pass diagnostics for durativity, yielding both an *after* and *during x time* reading with the *take time* diagnostic (Beavers and Koontz-Garboden, 2020). Importantly, this is dependent on the kind of scale a particular root lexicalizes and whether the scale is open (i.e. multi-point) or close (i.e. simple two point scales). Open scales naturally yield durativity while closed scales yield punctuality (Beavers, 2008). Thus, result verbs can be differentiated based on the kinds of scale they lexicalize, producing different behaviors with this diagnostic, such as between gradable and non-gradable adjectives. On the other hand, verbs that contain both a manner and result component complicate the picture somewhat, since it is not clear whether durativity derives from the complex change encoded by the manner component or an open scale encoded by the result component. Nonetheless, if one can determine that the change encoded by a verb root is closed and consists of a two-point scale, then the verb must encode a complex manner component if it is durative. This is the case for both *murder*-type verbs and verbs of stealing, which encode a state of death and possession. These are non-gradable and if these verbs show durativity, it must not be because of the result state but because of a complex manner component, In this regard, Ausensi (2020) shows that these *murder*-type verbs and verbs of stealing show durativity, allowing two different readings with the *take time* diag-

nostic. Hence, in addition to encoding a non-gradable result, they also encode a complex change characteristic of manner verbs.

(2.86) a. It took John 5 minutes to murder Tom. (*after/during* 5 minutes)

b. It took the knight 5 minutes to assassinate the king. (*after/during* 5 minutes)

c. It took the soldiers 5 minutes to massacre / slaughter their enemies. (*after/during* 5 minutes)

(2.87) a. It took the burglar 5 minutes to steal all the money in the house. (*after/during* 5 minutes)

b. It took the police officer 5 minutes to seize this illegal car. (*after/during* 5 minutes)

c. It took the train passenger 5 minutes to snatch this luxury watch. (*after/during* 5 minutes)

Murder-type verbs and verbs of stealing therefore argue against a strict MANNER-RESULT COMPLEMENTARITY in the lexical semantic entailments of roots and the BT-R, as has already been argued by Beavers and Koontz-Garboden (2012, 2020) and Ausensi (2020). Following these authors, I have analyzed the roots of these verbs as denoting a predicate of states that encode the states of death and possession, with root-entailed causative semantics and intentionality, differing in whether they take their external arguments as semantic arguments.

2.5.2 Manner or Result Roots? Stative Passives and *Break*-type Verbs

There is in principle, however, a different way of analyzing the roots of *murder*-type verbs and verbs of stealing, which is to suggest that they are manner verbs that entail a result state. In fact, this is precisely how Embick (2009) treats root

classes like $\sqrt{\text{BREAK}}$.[20] The key observation Embick (2009) makes is that roots like $\sqrt{\text{BREAK}}$ show similarities with roots like $\sqrt{\text{DARK}}$ in undergoing the causative-inchoative alternation and having a result state accessible for durative modifiers, but differ in their acceptability in forming stative passive forms and pure stative forms.

(2.88) Similarities

a. Causative-inchoative alternation:

1. John broke the vase. / The vase broke.
2. The clouds darkened the sky. / The sky darkened.

b. Sub-lexical modification with duratives:

1. We are going to break the connection for 2 hours.
(2 hours in broken state)
2. The organizers will darken the room for two hours.
(2 hours in dark state)

(2.89) Differences

a. Stative passives:

1. The chair is broken.
2. # The sky is darkened.

b. Pure statives:

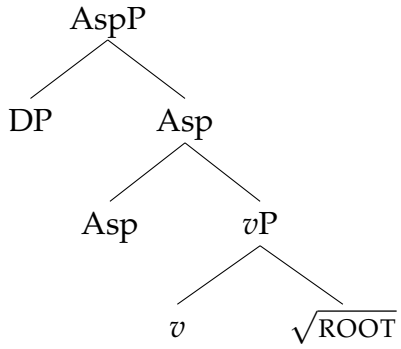
1. # The chair is broke.
2. The sky is dark.

Since the causative-inchoative alternation as well as accessibility for durative modification of states are analyzed as roots being in a result root position and

[20] Beavers and Koontz-Garboden (2012, 2020) treat the roots of verbs like *break* as result roots that are predicates of states that entail change, in line with *murder*-type verbs and verbs of stealing.

are semantically predicates of states, it shows that $\sqrt{\text{BREAK}}$-type roots must also be predicates of states. On the other hand, stative passives show that the two root classes do not behave alike. Adopting the analysis of stative passives from Embick (2004) as involving the structure below, Embick (2009) suggests that the difference between the two root classes must at the same time boil down to a difference in where they are inserted into the structure. Since the stative passive involves an ASP head that names a state created by the little v, roots that form stative passives must be manner roots in that they are inserted as modifiers of a little v introducing the CAUSE relation.[21]

(2.90) Structure of stative passive



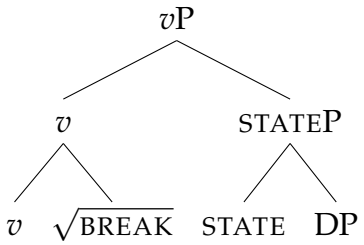
(2.91) $[\![\text{AspP}]\!]$: $\lambda e_s.\exists e[\text{Root}(e) \wedge \text{STATE}(\text{DP},e_s) \wedge \text{CAUSE}(e,e_s)]$

There is a hence an analytical tension for roots like $\sqrt{\text{BREAK}}$, since the two categories of diagnostics suggest they are both manner and result roots, consistent with the observations in Beavers and Koontz-Garboden (2012, 2020). However, adopting the BT-R precludes an analysis like that adopted in Beavers and Koontz-Garboden (2012, 2020) for $\sqrt{\text{BREAK}}$ and for *murder*-type verbs and verbs of stealing in Ausensi (2020), Ausensi, Yu, and Smith (2020c), and here. As a result, Embick (2009) proposes that roots like $\sqrt{\text{BREAK}}$ are predicates of events and are always inserted in a manner root position, as a modifier of v. Yet, while it is

[21] In Embick (2004), little v is interpreted as introducing a BECOME-like relation he labels the fientive.

inserted in a manner root position, it always selects a 'proxy' stative complement whose identity is determined by the manner root, shown in (2.92). As Embick (2009) notes, this naturally account for examples like *break the box open*, where the stative complement of $\sqrt{\text{BREAK}}$ can in fact be named by another result root.

(2.92)



The behavior of $\sqrt{\text{BREAK}}$ in regards to the similarities and differences exhibited in contrast with roots like $\sqrt{\text{DARK}}$ is therefore stated as a distributional generalization over a piece of structure that is larger than just where it is immediately inserted, including the kinds of complements that a root must select. Three classes of roots in regards to their semantics emerges as in (2.93). Given the characterization of $\sqrt{\text{BREAK}}$ as a manner root modifier of v, its appearance in a stative passive is predicted while roots like $\sqrt{\text{DARK}}$, being a predicate of states, is precluded.

(2.93) a. $\sqrt{\text{DARK}}$-type: Predicates of states

b. $\sqrt{\text{POUND}}$-type: Predicates of events, cannot co-occur with STATE

c. $\sqrt{\text{BREAK}}$-type: Predicates of events, must co-occur with STATE

I comment first on Embick's (2009) analysis for mixed manner-result roots as in (2.92). One issue with adopting such an analysis with a proxy stative constituent is why such a stative constituent is never available for sub-lexical modifiers like *again*. I build a context here where an object was deliberately made broken and no event caused the object to go from an unbroken state to a broken state. As shown below, it is unacceptable to assert the sentence with *again*, suggesting

that no such state is available for *again* to attach even if durative modification of the state is possible as shown in (2.88b).[22]

(2.94) CONTEXT: Mary requested a potter to make a plate in separate pieces so she can practice her pottery-mending skills. She took a day to put the pieces together. John, who was secretly angry with Mary for previously breaking his favorite bowl, snatched the mended plate from Mary and... # John broke the plate again.

In fact, Embick (2009) acknowledges that much more would have to be said about how exactly a proxy result state is named compositionally by the root inserted in a manner root position and why this proxy result state is different from states named by actual result roots like $\sqrt{\text{OPEN}}$, which straightforwardly allows restitutive presuppositions as in (2.55). Similarly, it remains to be seen how the ASP head involved in a stative passive as in (2.90) and (2.91) can compositionally retrieve the state named by the root in a manner root position. As far as I can tell, this would not be straightforward and might require recourse to some level of non-compositionality, such that the semantics is calculated over larger pieces of structure using specialized compositional rules and not by combining the semantic denotations of individual nodes within the syntactic structure.

Putting aside $\sqrt{\text{BREAK}}$-type roots specifically and returning to *murder*-type verbs and verbs of stealing, if we take Embick's (2009) analysis of the stative passive at face value and use it as a diagnostic for root classes, we see that the diagnostic is not as clear-cut for these verbs. *Murder*-type verbs and verbs of stealing,

[22]Embick's (2009) analysis is, in fact, similar in spirit to Marantz's (2007, 2009) analysis for creation verbs. Marantz (2007, 2009) implements it as a type-shifting rule applying to a DP to semantically derive a result state instead of locating it in the structure the root is embedded in. Both analyses face the same issue of predicting a restitutive presupposition, contrary to fact. Section 3.5.3 in the next chapter lays out the formal details of how such a restitutive presupposition is derived and how such presuppositions are unavailable even for canonical result roots like $\sqrt{\text{OPEN}}$.

to my ear, are at best highly awkward in stative predication constructions.

(2.95) a. ?? The king is murdered / assassinated.
b. ?? The soldiers are massacred / slaughtered.
c. ?? The luxury watch is stolen / snatched / seized.

On the other hand, the stative passive forms seem to be much more acceptable to my ear in attributive adjectival positions preceding a noun, though with some variation between particular roots, as shown below.[23]

(2.96) a. The recently murdered / assassinated king
b. The recently ? massacred / ? slaughtered soldiers
c. This recently stolen / seized / ? snatched watch

The variation in acceptability between stative passive forms of *murder*-type verbs and verbs of stealing in stative predication contexts and attributive modification positions suggests that there might be a difference between how the forms are derived for these two particular environments. Nonetheless, if we take the Embick's (2009) analysis of the stative passive and the unacceptability of (2.95) at face value, we might conclude that *murder*-type verbs and verbs of stealing are result roots inserted as complements of little v rather than as modifiers, making them unsuitable for forming stative passives. This would thus be consistent with the analysis presented so far, where *murder*-type verbs and verbs of stealing are formed from roots that are predicates of states and are thus unsuitable for forming stative passive forms, which require the roots to be manner modifiers and thus predicates of events.

[23]This is in contrast to the stative passive formed with $\sqrt{\text{BREAK}}$, which is fully acceptable in both contexts e.g. *The clock is broken*, *the broken clock*.

2.5.3 Manner Roots Entailing Result States: Ditransitive Verbs of Caused Possession: Beavers and Koontz-Garboden (2017, 2020)

So far, I have analyzed *murder*-type verbs as roots inserted in a result root position but entailing causative semantics normally introduced structurally through a causative variant of little v. The discussion of Embick (2009) in the previous section brought up the possibility of a class of roots that are inserted in a manner root position but names a state that it selects for and must be present within the structure. This raises the question of another logical possibility: Are there roots that are always inserted in manner position but entail some kind of result component that is introduced structurally and not named by the root? Here, I briefly discuss a particular class of verbs in English that shows such roots exist, drawing on the analysis of ditransitive verbs of caused possession presented in Beavers and Koontz-Garboden (2017, 2020).

It is well-known that classes of ditransitive verbs can alternate between a double-object and a dative construction. It has been noted further at least since Green (1974) and Oehrle (1976) that the double-object construction exhibits a subtle meaning difference from the dative construction in regards to the semantic role the first object in a double object construction can bear. Descriptively, the referent of the first object of a double-object construction must be at least a prospective possessor of the referent of the second object and is limited to animate entities (Gropen et al., 1989; Harley, 2003, a.o.).[24] In (2.97d), this leads to an interpretation of *Philadelphia* as an organization or group of people and animate (Green, 1974; Harley, 2003). In (2.98a), there is a stronger implication that the students actually learnt some French and not in (2.98b) (Oehrle, 1976). In (2.99a), there is a strong implication that a baby already exists and not in (2.99b) (Kayne, 1975).

[24]Harley and Jung (2015, pp. 704-705) note that the animacy requirement is dependent on the kind of possession encoded; alienable possession requires an animate referent while inalienable possession does not.

(2.97) a. The editor sent the article to Sue.
b. The editor sent the article to Philadelphia.
c. The editor sent Sue the article.
d. ?? The editor sent Philadelphia the article.

(2.98) a. John taught the students French.
b. John taught French to the students.

(2.99) a. I knitted our baby this sweater.
b. I knitted this sweater for our baby.

One way of accounting for these observations is to attribute different meanings to each construction, contributed by particular functional heads. Thus, Harley (2003) suggests that the double object construction involves a null prepositional head P_{HAVE} that encodes a possession relation, while the dative construction involves a $P_{LOC(ATION)}$ denoting a state of arrival at a location. The structures are illustrated below using bracketed notation.[25]

(2.100) a. [$_{vP}$ Agent [$_{v}$ v_{CAUSE} [$_{PP}$ Possessor [$_{P}$ P_{HAVE} Theme]]]
b. [$_{vP}$ Agent [$_{v}$ v_{CAUSE} [$_{PP}$ Theme [$_{P}$ P_{LOC} [$_{PP}$ Location]]]]

Harley's (2003) analysis thus makes an empirical prediction: when a surface verb appears in the double object construction, it must encode change in possession while in the dative construction, it must encode a change in location.[26] This

[25]Note that in the double object construction, the possessor is structurally higher than the theme, while in the dative construction the theme is structurally higher than the location. The particular structural configurations capture the binding facts first observed by Barss and Lasnik (1986).

[26]Possession here is to be interpreted quite loosely and not just as material possession, as shown by examples involving *teach* in (2.98). See, for example, Harley and Jung (2015) for discussion of how P_{HAVE} is interpreted semantically.

is certainly the case for the verbs *send* as shown in (2.97). However, Rappaport-Hovav and Levin (2008) show that this is not the case with all ditransitive verbs. In particular, different classes of verbs can determine what the double object and dative constructions can mean. I use the verbs *send* and *give* here to illustrate.[27] Beginning with the double object construction, Harley's (2003) analysis predicts that it should always require possession of the theme by the possessor referent. However, the requirement of possession is observed only with *give* and not with *send*, as shown by the possibility of canceling it overtly (Gropen et al., 1989; Beavers, 2011). Importantly, even if possession is not required with *send*, *prospective possession* is, as shown by the persistence of the animacy effect on the referent of the first object (Beavers and Koontz-Garboden, 2017).

(2.101) a. # John gave Mary the salt, but she never got it.

b. John sent Mary / # London the ball, but it flew off course before she got it.

It seems then that independent of the actual verb, the double object construction entails at least prospective change of possession as shown by the animacy constraint. Intuitively, whether or not the construction entails *successful* change of possession is down to individual verb choice; particular verb classes can 'strengthen' the semantics of prospective possession contributed by the double object construction while others do not, as shown by the contrast between *give* and *send*.

Turning now to the dative construction, since Harley (2003) proposes that it involves P_{LOC} rather than P_{HAVE}, the animacy constraint observed in the double object construction should be absent in the dative construction. As shown in

[27] Beavers and Koontz-Garboden (2017, 2020) discuss other classes of verbs, such as ditransitive verbs of ballistic motion like *throw*, accompanied motion like *carry* ad *take*, and verbs of future having like *promise*. The interested reader should consult these works for the relevant examples.

(2.97), this is indeed the case for *send*. Crucially, however, the dative construction with verbs like *give* lack change of location meanings altogether, as evidenced by the animacy constraint persisting even in the dative construction and contrary to the predictions of Harley (2003) (Rappaport-Hovav and Levin, 2008; Beavers and Koontz-Garboden, 2017).[28]

(2.102) John gave the money to Mary / # to London.

Similar to the double object construction, it seems that when the dative construction does have change of location semantics, it is again an entailment of *prospective change of location*. Different surface verbs can condition whether or not *successful* change of location is entailed, using the same cancellation test used in (2.101) (Beavers and Koontz-Garboden, 2017).

(2.103) a. # John brought the treaty to the security council, but it did not arrive.
b. Kim sent the ball to Sandy, but the wind blew it into the bushes and it did not arrive.

The core observation then is that the double object construction entails prospective change of possession, with the choice of individual verb roots determining whether or not this is strengthened to entail successful change of possession. On the other hand, the dative constructions seems to entail either prospective change of possession or prospective change of location, the choice of which

[28]Pesetsky (1995) makes the same observation, suggesting that the semantic role of the first object in the double object construction, a POSSESSOR, is a subset of the semantic roles of the object of the preposition *to*'s object in the dative construction, either a POSSESSOR or a PATH. Harley (2003) argues, however, that this would predict that in the dative construction, one should observe the kinds of semantic effects observed for double object constructions such as the existence effect in (2.99), leading her to propose they have two different structures and meanings. Importantly, what is missing from both these proposals is the role of the verb itself in determining what the particular construction can mean. I discuss how Beavers and Koontz-Garboden (2017, 2020) formalize this in what follows.

of these meanings is realized again dependent on the verb root. Building on Harley's (2003) analysis, Beavers and Koontz-Garboden (2017, 2020) propose the following semantics for the P_{HAVE} and P_{LOC}. P_{HAVE} encodes prospective possession, through a RECEIVE relation that is modalized using a sub-lexical modal operator. The modal base of the modal operator is defined by possible continuations qua inertia worlds, such that the result state holds at some accessible possible world including the world of evaluation (Koenig and Davis, 2001, pp. 86-89).

(2.104) a. $[\![P_{HAVE}]\!]$: $\lambda y.\lambda z.\lambda e.\Diamond$RECEIVE(y,z,e)

b. RECEIVE(y,z,e) is true iff the final state of y in e is HAVE(y,z) and at all prior points in e the state $\neg$HAVE(y,z) holds.

P_{LOC}, on the other hand, is less specific in terms of what it entails, encoding change of possession or change of location depending on the root choice. Beavers and Koontz-Garboden (2017, 2020) define P_{LOC} as a basic dyadic relation disjunctively generalizing over either a prospective RECEIVE or a prospective ARRIVE relation.

(2.105) a. $[\![P_{LOC}]\!]$: $\lambda y.\lambda z.\lambda e.\Diamond$R(y,z,e)

b. R(y,z,e) is true iff RECEIVE(y,z,e) is true or ARRIVE(y,z,e) is true.

c. RECEIVE(y,z,e) is true iff the final state of y in e is HAVE(y,z) and at all prior points in e the state $\neg$HAVE(y,z) holds.

d. ARRIVE(y,z,e) is true iff the final state on y in e is AT(y,z) and at all preceding times in e the state $\neg$AT(y,z) holds, though at every moment $\exists$l[AT(y,l)] holds and at temporally adjacent moments in e the corresponding AT states relates y to spatially adjacent locations (i.e. all locations in the event form a path).

With these assumptions in place, Beavers and Koontz-Garboden (2017, 2020) assume that roots of caused possession are, in fact, manner roots that modify a

CAUSE relation introduced by v. Roots of caused possession introduce a manner component and compose with v via a generalized PREDICATE MODIFICATION rule, but also encode two functions TH and RG. Formally, TH and RG take the result state that v + $\sqrt{\text{ROOT}}$ takes as an argument and returns the entity that is the possessee/theme and the entity that is the recipient/goal of the result state respectively.

(2.106) a. TH(P,e) returns the theme of e for P (i.e. TH(P,e) = ιy[P(e) $\rightarrow$ $\exists$z.$\Diamond$R(y,z,e)]

b. RG(P,e) returns the recipient/goal of e for P (i.e. RG(P,e) = ιz[P(e) $\rightarrow$ $\exists$y.$\Diamond$R(y,z,e)

Using $\sqrt{\text{GIVE}}$ as an example, the structure and semantic composition of a sentence like *John gave Mary the book* is provided below.[29] Note that we can simply replace TH(P,e) and RG(P,e) with the individual entities they return once the PP has composed with v + $\sqrt{\text{ROOT}}$.

(2.107) [$_{vP}$ John [$_{v'}$ [v $\sqrt{\text{GIVE}}$] [$_{PP}$ Mary [$_{P}$ P$_{\text{HAVE}}$ the book]]]]

(2.108) a. $[\![v_{\text{CAUSE}}]\!]$: λP.λx.λe[CAUSER(x,e) $\wedge$ P(e)]

b. $[\![\sqrt{\text{GIVE}}]\!]$: λP.λx.λe[MANNER(x,**giving**,e) $\wedge$ RECEIVE(TH(P,e),RG(P,e),e)]

c. $[\![v_{\text{CAUSE}}\ \sqrt{\text{GIVE}}]\!]$: λP.λx.λe[CAUSER(x,e) $\wedge$ P(e) $\wedge$ MANNER(x,**giving**,e) $\wedge$ RECEIVE(TH(P,e),RG(P,e),e)]

d. $[\![$PP$]\!]$: λe.$\Diamond$RECEIVE(*the book*,*mary*,e)

[29]Beavers and Koontz-Garboden (2017) adopt a different denotation for CAUSE, treating it as mono-eventive as compared to Kratzer (2005), who treats it as a relation between events. I represent their semantic denotations for discussion, but I think it should be entirely possible to recast the analysis using Kratzer's (2005) denotation, which I have adopted previously. In any case, the choice of implementation does not affect the point of this discussion, which is that one can analyze ditransitive verb roots as manner roots entailing a structurally introduced result state.

e. $[\![v']\!]$:
λx.λe[CAUSER(x,e) $\wedge$ $\Diamond$RECEIVE(*the book*,*mary*,e) $\wedge$ MANNER(x,**giving**,e) $\wedge$ RECEIVE(TH(λe[$\Diamond$RECEIVE(*the book*,*mary*,e)],e),RG(λe[$\Diamond$RECEIVE(*the book*,*mary*,e)],e),e)]
= λx.λe[CAUSER(x,e) $\wedge$ $\Diamond$RECEIVE(*the book*,*mary*,e) $\wedge$ MANNER(x,**giving**,e) $\wedge$ RECEIVE(*the book*,*mary*,e)]

f. $[\![vP]\!]$: λe[CAUSER(*john*,e) $\wedge$ $\Diamond$RECEIVE(*the book*,*mary*,e) $\wedge$ MANNER(john,**giving**,e) $\wedge$ RECEIVE(*the book*,*mary*,e)]

As Beavers and Koontz-Garboden (2017) note, the final denotation of *v*P contains both actual receiving and possible receiving. Since actual receiving entails possible receiving, by modus ponens (2.108f) comes to entail actual receiving. The root $\sqrt{\text{GIVE}}$ monotonically strengthens the meaning of the double object construction containing P_{HAVE}, and receiving thus cannot be canceled as in (2.101a). Similarly, because $\sqrt{\text{GIVE}}$ entails actual receiving, this will also subsume the dative construction containing P_{LOC}, since actual receiving entails possible receiving and the R relation introduced by P_{LOC} that disjunctively generalizes over receiving and arriving. Omitting the compositional details, the meaning of the dative construction with the root $\sqrt{\text{GIVE}}$ will ultimately produce the same meaning as in (2.108f), again accounting for the persistence of the animacy constraint even in the dative construction as in (2.102).

(2.109) For any y, z, e, RECEIVE(y,z,e) $\Rightarrow$ $\Diamond$RECEIVE(y,z,e) $\Rightarrow$ $\Diamond$R(y,z,e)

(2.110) $[\![$John gave a book to Mary$]\!]$:
λe[CAUSER(*john*,e) $\wedge$ $\Diamond$R(*the book*,*mary*,e) $\wedge$ MANNER(x,**giving**,e) $\wedge$ RECEIVE(TH(λe[$\Diamond$R(*the book*,*mary*,e)],e),RG(λe[$\Diamond$R(*the book*,*mary*,e)],e),e)]]
= λe[CAUSER(*john*,e) $\wedge$ $\Diamond$R(*the book*,*mary*,e) $\wedge$ MANNER(x,**giving**,e) $\wedge$ RECEIVE(*the book*,*mary*,e)]]

Turning now to *send*, it is easy to give it a root semantics that can capture the relevant facts. The root $\sqrt{\text{SEND}}$ simply entails prospective arrival. In the double

object construction, P_{HAVE} contributes prospective receiving and hence neither the root nor P_{HAVE} entail each other, leading to the animacy constraint observed in the double object construction and the possible canceling of receiving as in (2.101b). On the other hand, because the root entails prospective arrival, it subsumes the meaning of the dative construction, since prospective arrival entails the R relation introduced by P_{LOC}. Importantly, because the root only entails prospective arrival, the arrival itself can be canceled, as again shown in (2.103b). I provide a sketch of the semantics of the root and the meanings of the double object and dative construction with $\sqrt{\text{SEND}}$ below, omitting the compositional details and representing only the final step of the composition.

(2.111) $[\![\sqrt{\text{SEND}}]\!]$: λP.λx.λe[MANNER(x,**sending**,e) $\wedge$ $\Diamond$ARRIVE(TH(P,e),RG(P,e),e)]

(2.112) [John sent Mary the book]: λe[CAUSER(*john*,e) $\wedge$ $\Diamond$RECEIVE(*the book*,*mary*,e) $\wedge$ MANNER(x,**sending**,e) $\wedge$ $\Diamond$ARRIVE(TH(λe[$\Diamond$RECEIVE(*the book*,*mary*,e)],e),RG(λe[$\Diamond$RECEIVE(*the book*,*mary*,e)],e),e)
= λe[CAUSER(*john*,e) $\wedge$ $\Diamond$RECEIVE(*the book*,*mary*,e) $\wedge$ MANNER(x,**sending**,e) $\wedge$ $\Diamond$ARRIVE(*the book*,*mary*,e)

(2.113) [John sent the book to London]: λe[CAUSER(*john*,e) $\wedge$ $\Diamond$R(*the book*,*london*,e) $\wedge$ MANNER(x,**sending**,e) $\wedge$ $\Diamond$ARRIVE(TH(λe[$\Diamond$R(*the book*,*london*,e)],e),RG(λe[$\Diamond$R(*the book*,*london*,e)],e),e)
= λe[CAUSER(*john*,e) $\wedge$ $\Diamond$R(*the book*,*london*,e) $\wedge$ MANNER(x,**sending**,e) $\wedge$ $\Diamond$ARRIVE(*the book*,*london*,e)

The preceding discussion has shown then that we can analyze ditransitive verbs of caused possession as manner roots entailing result states introduced structurally. Coupled with the discussion of *murder*-type verbs and verbs of stealing, which I analyzed as result roots entailing eventive meanings introduced by the structural context, we have seen that in terms of lexical, truth-conditional entailments, MANNER-RESULT COMPLEMENTARITY and the BT-R cannot hold if we

are to account for the facts presented for these verb classes in this chapter, in line with Beavers and Koontz-Garboden (2012, 2020) and Ausensi (2020).

Importantly, Beavers and Koontz-Garboden (2012) note that MANNER-RESULT COMPLEMENTARITY and the BT-R make claims about both lexical, truth-conditional entailments as well as constraints on root insertion in syntactic event structure templates. While I have showed here that MANNER-RESULT COMPLEMENTARITY and the BT-R cannot hold at the level of lexical-semantic entailments if we are to account for the facts with *again*-modification with *murder*-type verbs and verbs of stealing, the insertion of these roots into event structures does indeed abide by MANNER-RESULT COMPLEMENTARITY and the BT-R in that roots are only ever inserted in a single position (Beavers and Koontz-Garboden, 2012, 2020). Nonetheless, one can imagine an alternative approach where roots can simply be inserted in different positions within the structure at the same time. For example, this is the assumption explicitly adopted by Ramchand (2008, pp. 59) within a first phase syntax that identifies structural positions like INIT(IATION), PROC(ESS), and RES(ULT), where a lexical semantic root can merge in one particular position and remerge in another. As Ramchand (2008) notes, this is not akin to head movement, since head movement does not capture the intuition that a single lexical semantic root can project more than one label within the first phase syntax. Clearly, the choice between these two kinds of approaches is an empirical question with theoretical implications for the nature of root insertion; I will leave this matter open for future investigation.

2.6 Chapter Summary

I began this chapter by outlining a common assumption in the argument structure literature that external arguments are syntactically and semantically severed from the verb and introduced via secondary predication (Kratzer, 1996). Us-

ing subjectless presuppositions with *again*, Bale (2007) showed that this cannot hold across all verb classes, distinguishing between non-stative non-resultative transitives, stative transitives, and intransitives in regards to the possibility of subjectless presuppositions. I showed that even Bale's (2007) classification was too coarse-grained, as some classes of non-stative and non-resultative transitive verbs, specifically *murder*-type verbs, allow for subjectless presuppositions. Based on the facts with subjectless presuppositions and presupposed intentionality, I devised a semantics for the roots of *murder*-type verbs as predicates of states entailing eventive meanings like CAUSE and also taking their external arguments directly as semantic arguments. Inserting such roots into a tripartitie verbal strucure containing VOICE and little *v* necessitated a view where these functional heads can be interpreted expletively, making no semantic contribution. Nonetheless, heads like VOICE are still required to be present due to case marking facts observed with nominalizations, and interpreting these heads expletively allowed for a separation of syntactic and semantic transitivity. I then examined verbs of stealing, which differed from *murder*-type verbs in entailing intentionality but allowing for subjectless presuppositions. Building off the analysis for *murder*-type verbs, I similarly analyzed these roots as predicates of states entailing eventive semantics but with no representation of their external arguments. Nonetheless, these roots made reference to their external arguments, introduced externally, within the result state denoted by the root. This necessitated them being inserted into a structure where unlike *murder*-type verbs, the structural context was not interpreted expletively and little *v* and VOICE contribute causative semantics and an AGENT semantic role.

The analysis presented for these verb classes has theoretical implications for hypotheses about the limits on the semantic content of roots. I reviewed two such hypotheses: Rappaport-Hovav and Levin's (2010) MANNER-RESULT COMPLEMENTARITY and Embick's (2009) BIFURCATION THESIS FOR ROOTS. When

evaluated against these hypotheses, the analysis presented in this chapter clearly showed that if one were to take the facts with *again*-modification presented in the chapter seriously, it would be very difficult to maintain these hypotheses. In particular, Embick (2009) himself acknowledged the existence of mixed root classes like $\sqrt{\text{BREAK}}$ and suggested that they should be analyzed as manner roots inserted in a modifier of little v position, but always selecting for a proxy result state that the root names. Using the very diagnostic Embick (2009) utilizes to make his claim, namely the stative passive, I showed that regardless of how one analyzes roots like $\sqrt{\text{BREAK}}$, it would seem like *murder*-type verbs and verbs of stealing should be analyzed as being in a result root position as they do not form stative passives readily.

Finally, I discussed another class of roots, namely the roots ditransitive verbs of caused possession. These verbs commonly alternate between a double object and dative construction, with authors like Harley (2003) assigning different structural meanings to each variant. I discussed Rappaport-Hovav and Levin (2008) and Beavers and Koontz-Garboden's (2017, 2019) observation that the kinds of meanings entailed by the particular structural variant can be determined or strengthened by different choices of roots. Beavers and Koontz-Garboden (2017, 2020) provide an analysis where these roots are manner roots inserted in a modifier of little v position, but can monotonically entail the meanings contributed by each structural variant, leading to the verb-sensitive hypothesis of ditransitive verbs in regards to entailment of successful transfer or arrival as well as animacy constraints on particular arguments (Rappaport-Hovav and Levin, 2008).

On a broader, theoretical level, this filled in the other logical possibility: that there are manner roots that entail result states in addition to result roots that entail eventive meanings. The overall conclusion then is that while MANNER-RESULT COMPLEMENTARITY and the BIFURCATION THESIS FOR ROOTS can be shown to not hold in terms of lexical, truth-conditional entailments, I have presented analy-

ses that suggested they hold at the level of syntactic event structure. Other analyses couched in different frameworks have done away with these constraints even at the level of syntactic event structure, and it remains an open question whether there are empirical advantages or drawbacks to maintaining or abandoning these hypotheses on possible lexical semantic root meanings and positions in which they can be inserted.

CHAPTER 3

Restitutive Presuppositions and Quantificational Internal Arguments[†]

In this chapter, I move away from the repetitive presuppositions used in the previous chapter to explore the nature of the external argument and how and where it is introduced. Instead, I utilize what has been called restitutive presuppositions (Dowty, 1979; von Stechow, 1995, 1996; Beck and Johnson, 2004, a.o.) to explore how internal arguments are introduced with change-of-state verb roots, which I take to be those that have a simple adjectival form and denote properties on closed scales, such as *open*, *dry*, *clean*, *straighten*, *empty*, *fill*, etc. These verb roots exhibit the lexical causative-inchoative alternation; contra many small clause theories of the lexical-causative inchoative alternation with change-of-state verb roots (Hoekstra, 1988; Pylkkänen, 2002; Pylkkänen, 2008; Harley, 2005, a.o.), I argue that the result state constituent of the lexical causative variant must differ from inchoatives. This is based on the observation that when the argument of the result state is quantificational, the lexical causative variant exhibits a two-way ambiguity as compared to the inchoative, which exhibits only a single restitutive presupposition. I capture this by analyzing the result state of lexical causatives as containing an acategorial root containing an unbound variable to be bound by the holder argument, introduced by a higher, stative functional v head. Inchoatives differ from lexical causatives in lacking this stative v layer, instead being

[†]Parts of the material in this chapter were presented at the Seoul International Conference on Generative Grammar (SICOGG) 21 in conjunction with Generative Linguistics in the Old World (GLOW) in Asia XII, Arizona Linguistics Circle (ALC) 13, as well as the 94th annual meeting of the Linguistics Society of America. A proceedings paper based on the presentations has appeared as Smith and Yu (2020b).

verbalized directly by an eventive *v* head.

The analysis proposes the existence of a result state predicate that is fully specified for its argument structure, which I take to be the semantics of a bare acategorial result root in the Distributed Morphology (DM) sense (Halle and Marantz, 1993; Pesetsky, 1995; Harley, 2014). This will differ from the usual assumption that a change-of-state verb root is model-theoretically a function from individuals to predicates of events (Levinson, 2007, 2014), arguing instead that they are really simply predicates of events with an unbound variable that is abstracted over and bound before their arguments are syntactically introduced, an idea already present in the earliest works on *again*-ambiguities in Generative Semantics like Dowty (1976) and also assumed explicitly in Rothstein (2004). Along the way, I consider as well lexical ambiguity approaches to the repetitive-restitutive ambiguity and different implementations for a scope ambiguity analysis (e.g. Fabricius-Hansen, 2001; von Stechow, 1996; Bale, 2007). I provide arguments against a lexical ambiguity analysis, and show that quantificational arguments allow us to decide between these different scope-based analyses based on the presuppositions that they produce.

I then consider another morphological process that leads produces restitutive presuppositions, namely *re*-prefixation, and show how it is different from *again* based on its behavior with quantificational arguments with change-of-state verb roots (Dowty, 1979; Keyser and Roeper, 1992; Marantz, 2005, 2007). Armed with an understanding of the restitutive presupposition that *again* and *re-* give rise to, I then use it as a diagnostic to probe the lexical semantics of other verb classes, such as degree achievements (Kennedy and Levin, 2008), which I define as those verb roots that denote properties on open scales rather than closed ones. I argue that they require a different analysis in light of the interactions they show with *again*'s restitutive presupposition, adopting an event-based analysis that differentiates between change-of-state and degree achievement verb roots rather than a

unified scalar analysis (Kennedy and Levin, 2008; Pedersen, 2015), before closing the chapter.

3.1 Setting the Scene: Restitutive Presuppositions with Change-of-State Verb Roots

Again is well-known for exhibiting the repetitive-restitutive ambiguity with causative-inchoative verbs, an observation already noted by work in Generative Semantics (Morgan, 1969; McCawley, 1971; Dowty, 1979, a.o.) and taken up in more modern syntactic approaches to lexical decomposition (von Stechow, 1995, 1996; Beck and Johnson, 2004; Harley, 2005, 2012a, a.o.). This is most readily observed with change-of-state verbs that denote closed scales of the property they lexically encode (whether top or bottom closed or both), such as *open*, *dry*, *clean*, *straighten*, *empty*, *fill*, etc. (Pedersen, 2015). I illustrate simple examples here using the causative variant of the verbs *open* and *dry*, expressing the properties of an object possessing a maximum degree of openess and dryness. The repetitive presupposition presupposes there was an identical event that happened temporally prior to the asserted event, which was discussed extensively in the previous chapter. The restitutive presupposition, on the other hand, presupposes that there was a temporally prior and identical *state*, and the asserted event restored this particular state.

(3.1) Mary opened the door again.

a. Mary previously opened the door, it got closed, and she opened it again. (*Repetitive*)

b. The door was previously open, it got closed, and Mary opened it again. (*Restitutive*)

(3.2) Mary dried the rug again.

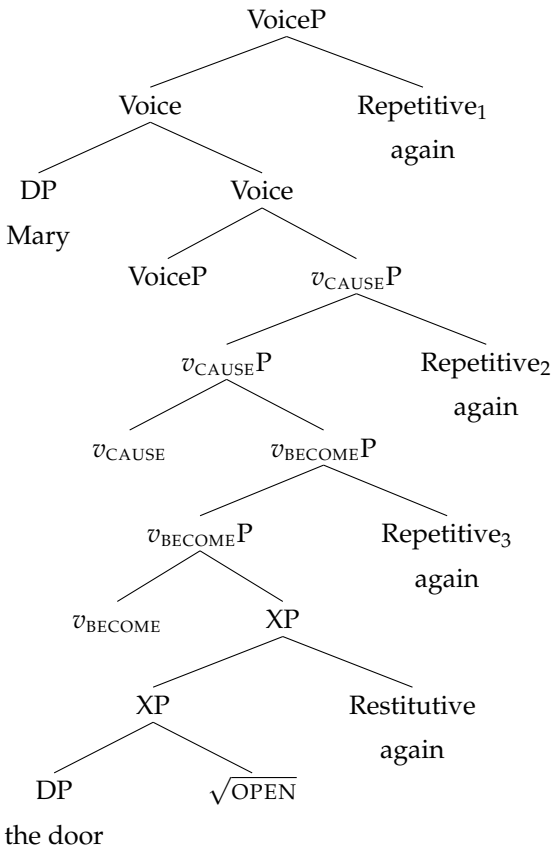
a. Mary previously dried the rug, it became wet, and she dried it again. (*Repetitive*)

b. The rug was previously dry, it became wet, and Mary dried it again. (*Restitutive*)

Building on the decomposition of causative verbs like *open* and *dry* into primitive predicates like CAUSE and BECOME in a conceptual semantics language in the Generative Semantics tradition (Morgan, 1969; McCawley, 1971; Dowty, 1979), von Stechow (1995, 1996) argues for such lexical decomposition to be represented syntactically, with CAUSE and BECOME representing functional v heads. I adapt von Stechow's analysis (1995; 1996) for the English example with *open*, assuming a separation of VOICE and v_{CAUSE} and representing the result predicate as an acategorial root $\sqrt{\text{OPEN}}$, which undergoes successive head movement through to VOICE to derive the surface order (Pylkkänen, 2002; Harley, 2009, 2013, 2017)[1]. This set of theoretical assumptions produces a four-way ambiguity, which can be verified with the contexts in (3.4) showing how *again*'s presupposition can be satisfied (adapting from Beavers and Koontz-Garboden, 2020).

(3.3) Mary opened the door again.

[1] I discuss arguments from Pylkkänen (2002) and Harley (2012a) that the stative result predicate should be an acategorial root and BECOME is not explicitly represented syntactically in a later section.



(3.4) Mary opened the door again.

a. ... and Mary had opened it before. (*Repetitive*$_1$)

b. ... and John had opened it before. (*Repetitive*$_2$)

c. ... and the door had opened before. (*Repetitive*$_3$)

d. ... and the door was open before. (*Restitutive*)

I concern myself in this chapter with restitutive presuppositions.[2] Its availability argues for a distinct result state constituent present in the syntax for that *again* can attach to. Assuming as I have so far that *again* is of type

[2]The reader might, however, have noticed that the repetitive presuppositions in (3.4b) and (3.4c) correspond to Bale's (2007) subjectless presuppositions where the presupposition either does not contain the same agent argument of the asserted event or does not contain an agent at all. I discussed this extensively in Chapter 2 and leave this aside here.

$<<s,t>,<s,t>>$, being an identity function on predicates of events introducing a presupposition as repeated in (3.5) (von Stechow, 1996; Bale, 2007), this shows that the result state constituent must be of type $<s,t>$, containing both the result state predicate and its holder argument. In short, roots like $\sqrt{\text{OPEN}}$ must be of type $<e,<s,t>>$, a function from individuals to predicates of events. This is consistent with Levinson (2007, 2014), who argues for the same semantic type for change-of-state predicates.

(3.5) $[\![\text{again}]\!]$: $\lambda P_{<s,t>}.\lambda e.P(e)$
PRESUPPOSITION: $\exists e^1.\exists e^1[e^1 \prec e^2 \prec e \wedge P(e^1) \wedge \neg P(e^2)]$

(3.6) $[\![\sqrt{\text{OPEN}}]\!]$: $\lambda x.\lambda e_s.\text{OPEN}(x,e_s)$

3.2 On Quantificational Holder Arguments

3.2.1 Two Different Restitutive Presuppositions

Arguments such as the one made above for the existence of a result state constituent to be present syntactically typically make use of definite arguments of semantic type *e*, as this would clearly show that the result state constituent is a predicate of states of type $<s,t>$, the correct semantic type for *again* to take as its semantic argument. Less discussed in the literature is the interaction of *again*'s restitutive presupposition with quantificational DPs that bear the semantic role of the holder of the result state predicate (though see Jäger and Blutner, 2003; Nissenbaum, 2006; Tomioka, 2006; Bale, 2007; Dobler, 2008). In fact, when the holder argument is a quantificational DP such as the English indefinite in the lexical causative, a two-way ambiguity is observed with restitutive presuppositions. Intuitively, this ambiguity has to do with whether the entity that is the holder argument is the same entity across the asserted and presupposed event of *again*

(Bale, 2007).[3] The following contexts illustrate the two different restitutive presuppositions, with the difference lying in whether the door that was previously in a state of being open in the presupposed event is the same as the one in the asserted event.

(3.7) a. CONTEXT: There are two doors, door A and door B. Door A was built open and door B built closed. The wind blows door A shut. Mary comes by and restores door A's open state so...
✓ Mary opened a door again.

b. CONTEXT: There are two doors, door A and door B. Door A was built open and door B built closed. The wind blows door A shut. Mary comes by and opens door B so...
✓ Mary opened a door again.

Note that the restitutive presuppositions here cannot be assimilated to repetitive ones simply because the scenarios which satisfy the repetitive presupposition also satisfies the restitutitve presupposition i.e., repetitive presuppositions asymmetrically entail restitutive presuppositions (von Stechow, 1996; Beck and Johnson, 2004; Bale, 2007; Lechner et al., 2015; Pedersen, 2015). As shown in the contexts above, Mary never opened any door previously and the door had never been opened previously either. This is indicated by the linguistic description of the context using a creation predicate like *build*, which Embick (2004, 2009) notes indicates that *open* is a simple pure stative that need not be inherently caused by an event. Since a repetititve presupposition is ruled out by the given context, this means that *again* is scoping below the agent argument *Mary* in the subject position and also below BECOME i.e., below the positions which produce repetitive presuppositions shown in (3.3) (Bale, 2007; Lechner et al., 2015).

[3]Beck and Johnson (2004), Nissenbaum (2006), and Tomioka (2006) discuss this ambiguity with complex causative constructions like resultatives in English, where the causing event and the result state are named by two separate roots e.g. *hammer the metal flat*.

For ease of exposition, I refer to the presupposition in (3.7a) as a *bound restitutive presupposition* and the presupposition in (3.7b) as the *quantificational restitutive presupposition*. Formally, this boils down to whether the existential quantifier associated with the indefinite determiner *a* is interpreted inside or outside of *again*'s presupposition (Nissenbaum, 2006; Bale, 2007). Interpreting the existential quantifier outside of *again*'s presupposition and leaving a bound variable in it produces a bound restitutive presupposition, while interpreting the existential quantifier inside *again*'s presupposition produces a quantificational presupposition where the entity within the presupposed event can be a different one from the entity in the asserted event.[4]

It is worth pointing out that the existence of the quantificational restitutive presupposition is sometimes disputed in the literature. Lechner et al. (2015), for example, claim that the restitutive presupposition imposes a wide scope requirement with respect to quantifiers in object position. They verify this using the following context, showing that contexts where the holder of the state in the prior event differs from the holder of the state in the assertion does not satisfy *again*'s restitutive presupposition (Lechner et al.'s 2015 examples (24) and (25)).

(3.8) CONTEXT: John is in a room with two windows. One window is open

[4]I restrict the discussion in the chapter to the existential quantifier introduced by the indefinite determiner. As far as I can tell, other quantificational elements like numerals, *most*, and *some* lead to the same effect, where the entities holding the result state in the assertion need not be (completely) identical to those in the presupposition. Robert Henderson (personal communication) notes that strong quantifiers like *every* and *all* do not exhibit the same effect, suggesting that it is perhaps those quantifiers that introduce new discourse referents that exhibit this effect. This suggests an analysis along the lines of Discourse Representation Theory or dynamic semantics would be appropriate, though I will not be able to explore that intuition further here. Non-monotone quantifiers like *exactly one* are discussed by Lechner et al. (2015), who argue that they lead to the similar conclusion that the repetitive and restitutive presuppositions of *again* must have different representations. I will not consider those cases here to keep the chapter manageable and readable, and not for the lack of significance of these quantifiers.

and the other is closed. John opens the closed window so...
John opened a window again.

Note, however, that their context contains an important difference with the one in (3.7b), which satisfies a quantificational restitutive presupposition: that the presupposed prior state was reversed in an intermediate temporal interval between the presupposed state and the asserted event (Fabricius-Hansen, 2001; Pedersen, 2015). This leads to two conclusions. First, Lechner et al.'s (2015) claim that the restitutive presupposition always requires *again* to have wide scope over quantifiers in object position is incorrect. Second, that the context which supports a quantificational restitutive presupposition always requires the reversal of the result state in an intermediate temporal interval. Note that such a reversal is also required to produce the bound restitutive presupposition in (3.7a) and thus it seems that the reversal must be part of the contribution of *again* (Fabricius-Hansen, 2001; Pedersen, 2015). I return to this issue in a later section where I argue that the presupposition of *again* must contain explicit negation over the denotation of the constituent it attaches to syntactically (Bale, 2007).

Having established the existence of an ambiguity in restitutive presuppositions with quantificational arguments, and given analyses of how the restitutive presupposition (without a quatificational argument) is derived as in (3.3), we might wonder now how this ambiguity can be derived given the syntactic and semantic assumptions about *again*. I turn to this issue next.

3.2.2 Against Quantifier Raising: The Case of Inchoatives

As is standard in the literature, a widely assumed approach to account for scope ambiguities is the rule of QUANTIFIER RAISING (QR) (May, 1977), whereby a quantifier is raised in the syntax to take syntactic and semantic scope over another. This is mostly motivated by the need to resolve a semantic type mismatch between a quantificational DP of type $<<e,t>,t>$ (Barwise and Cooper, 1981) and

a verb of type <*e*,*t*> or <*e*<*e*,*t*>>, leaving a bound variable of semantic type *e* in the original position. A simple example with two quantifiers in subject and object position is illustrated below. For the inverse scope case in (3.9b), two applications of QR are employed to derive inverse scope.

(3.9) Every girl loves a dog.

a. [a dog_i λx [Every girl loves x_i]] ($\exists > \forall$)

b. [Every girl_j λy [a dog_i λx [y_j loves x_i]]] ($\forall > \exists$)

Since the ambiguity in restitutive presuppositions is reduced to a scope ambiguity (Bale, 2007), one might naturally think that QR can be used to derive the two presuppositions. For the quantificational presupposition, the quantificational DP should be interpreted in-situ inside the constituent that *again* attaches to, such that the existential quantifier will be present in *again*'s presupposition.[5] Conversely, the bound presupposition will have a bound variable left behind by an application of QR within *again*'s presupposition, which is bound by the raised quantificational DP. This is illustrated schematically using bracketed notation below for a root like $\sqrt{\text{OPEN}}$, assuming a small clause analysis of the result state constituent.[6]

(3.10) a. [$_{\text{CAUSE}P}$ CAUSE [$_{\text{BECOME}P}$ BECOME *again* [$_{SmallClause}$ DP $\sqrt{\text{OPEN}}$]]]

b. [DP_i λx_i [$_{\text{CAUSE}P}$ CAUSE [$_{\text{BECOME}P}$ BECOME *again* [$_{SmallClause}$ x_i $\sqrt{\text{OPEN}}$]]]]

There is, however, reason to believe that while QR can derive both presuppositions straightforwardly, it is not the correct approach to capture the ambiguity

[5]Note, however, that if a quantificational DP is of type <<*e*,*t*>,*t*>, interpreting it in-situ is impossible due to a type mismatch and it will have to raise via QR to a position structurally higher than its base position but below *again*. I assume simply that this happens in the following discussion about interpreting it in-situ for exposition's sake, but assign a quantificational DP a different semantic type in the proposed analysis.

[6]I omit structure above CAUSEP for simplicity.

in restitutive presuppositions. Evidence for this comes from the inchoative variant of change-of-state verb roots, which are commonly assumed to differ from the lexical causative in lacking the abstract predicate CAUSE and containing only BECOME, and are thus properly contained within the syntax and semantics of the lexical causative (see for example Beavers and Koontz-Garboden, 2020).[7] If so, parallel to the lexical causative, we expect two different kinds of restitutive presuppositions should also be available with quantificational DPs, one derived from interpreting the DP in-situ and one derived from QR of the quantificational DP.

(3.11) a. [$_{\text{BECOME}P}$ BECOME *again* [$_{SmallClause}$ DP $\sqrt{\text{OPEN}}$]]

b. [DP$_i$ λx_i [$_{\text{BECOME}P}$ BECOME *again* [$_{SmallClause}$ x_i $\sqrt{\text{OPEN}}$]]]]

This expectation is, however, not borne out. Inchoative variants of change-of-state verbs like *open*, surprisingly, exhibit only the bound restitutive presupposition and not the quantificational one.[8] The context below illustrates the lack of such a presupposition.

(3.12) a. CONTEXT: There are two doors, door A and door B. Door A was built open and door B built closed. The wind blows door A shut. Another gust of wind blew through and door A opened so...
✓ A door opened again.

b. CONTEXT: There are two doors, door A and door B. Door A was built open and door B built closed. The wind blows door A shut.

[7] Harley (2012a), however, argues at length against the lexical causative containing BECOME, proposing that it only contains CAUSE and a result state as in Folli and Harley (2005). I review these arguments in a later section.

[8] This is reminiscent of an objection raised by Jäger and Blutner (2003) with directed motion constructions, which they use to argue against the scope analysis of *again*-ambiguities of von Stechow (1995, 1996). I address this objection in a later section.

Another gust of wind blew through and door B opened so...
A door opened again.

It is surprising under a QR analysis of the ambiguity with restitutive presuppositions that the inchoative does not permit a quantificational restitutive presupposition. When permitted, only a quantificational *repetitive* presupposition is available, as demonstrated by manipulating the context such that the presupposed prior event is eventive rather than stative.

(3.13) CONTEXT: There are two doors, door A and door B. Both doors are built closed. A gust of wind blows through the room and door A opens. Mary comes through and closes door A. Much to her chargrin, another gust of wind blew through and door B opened so...
✓ A door opened again.

One might attempt to salvage the QR analysis by simply saying that for some reason, QR is always obligatory in inchoatives. One such reason might be the fact that the quantificational DP always needs to raise to subject position in English to satisfy the Extended Projection Principle (EPP) on a higher functional head like T(ense) (Chomsky, 1981).[9] Since such movement is syntactic, the raised holder argument will always take scope above *again* and only a bound presupposition will ever arise as there will only be a bound variable in *again*'s presupposition. However, it would be mysterious why raising the holder argument to subject position due to the EPP does not permit reconstruction of the quantificational DP into its base position with the inchoative, since the quantificational presupposition is never available as in (3.12b). Furthermore, other cases of raising to subject position with change-of-state verbs like *open*, where the holder argument is quantificational, readily allows reconstruction. Passivization, for example, produces a quantificational restitutive presupposition as illustrated below with a similar

[9] I thank an audience member at SICOGG 21 and GLOW in Asia XII for raising this possibility.

context in (3.12b), modulo the addition of an agent since passivization involves an implicit agent.[10]

(3.14) CONTEXT: There are two doors, door A and door B. Door A was built open and door B built closed. The wind blows door A shut. Mary came into the room and opened door B so...
✓ A door was opened again (by Mary).

The fact that passivization readily allows for reconstruction to produce a quantificational restitutive presupposition while inchoatives do not suggests that raising to subject position is not the reason such a presupposition is unavailable in the inchoative. Furthermore, the fact that lexical causatives readily allow both a bound and quantificational presupposition while inchoatives allow only a bound presupposition casts doubt on analyses where lexical causatives share a common core with inchoatives, namely the abstract predicate BECOME and a result state constituent. In the following sections, I outline an analysis where the available presuppositions are tied directly to the semantic types of the constituents in the syntactic structure without postulating scope-taking movement operations like QR.

3.3 Analysis

3.3.1 Decomposing the Result State Constituent

To account for the difference between lexical causatives and inchoatives in regards to quantificational restitutive presuppositions, I propose to reject three key assumptions implicit in the analyses presented above. First, I suggest that contra theories of the semantics of change-of-state verb roots like Levinson's (2007; 2014), who treats change-of-state verb roots as of semantic type $<e,<s,t>>$, these

[10] I thank Ryan Walter Smith (personal communication) for suggesting this counterargument.

verb roots instead enter the semantic computation simply as predicates of states of type $<s,t>$. Change-of-state verb roots like $\sqrt{\text{OPEN}}$ have a holder argument represented in their semantics, but this argument is an unbound variable of type e that is abstracted over and bound by a syntactic argument introduced later in the syntactic derivation via LAMBDA ABSTRACTION, as in (3.15).

(3.15) $[\![\sqrt{\text{OPEN}}]\!]$: $\lambda e_s.\text{OPEN}(x,e_s)$

This idea already has precedents in earlier works. Rothstein (2004), for example, introduces it as a rule of PREDICATE FORMATION that operates on maximal projections like VPs and APs, raising a type $<s,t>$ constituent to type $<e,<s,t>>$ for her rule of SECONDARY PREDICATE SUMMATION to form complex predicates in depictive modification and resultative formation.[11] Hole (2005) ties LAMBDA ABSTRACTION to the introduction of an AFFECTEE head in German to analyze possessor datives, where a dative argument is both an affectee and also a possessor, similar to Kratzer (2009) who suggests these lambda operators can be carried by verbal functional heads like little v.[12] I will, for simplicity, assume that LAMBDA ABSTRACTION is triggered in the semantic component of the grammar

[11] As Heidi Harley (personal communication) points out, Rothstein's (2004) analysis applies to *all* verbs. Without empirical investigation across more verb classes, I will not make this claim, concentrating on change-of-state verb roots.

[12] More formally, the unbound variable will be one that is assigned an arbitrary numerical index by an assignment function, as shown below.

(i) $[\![\sqrt{\text{OPEN}}]\!]$: $\lambda e_s.\text{OPEN}(g(n),e_s)$

Little v heads carry lambda binders with numerical indices (e.g. λn), shifting all occurrences of g(n) to a variable that is abstracted over and opening up an argument slot (Heim and Kratzer, 1998; Kratzer, 2009). Little v introduces a DP binder that bears the same numerical index, saturating the created argument position and hence binding all occurrences of g(n). For perspicuity, I omit the assignment function in my representations but the reader should take the lambda abstraction I assume to be given the precise semantic implementation discussed here.

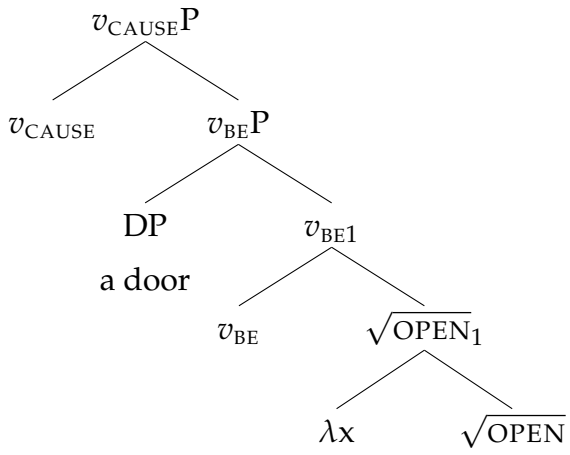
when a syntactic structure is sent for semantic interpretation, and that it is triggered in order to make the root relational in the presence of a verbal functional heads, relating an entity to an event. This assumption that the change-of-state verb root is a predicate of events with an unbound variable to be abstracted over and bound in the presence of a little v head will be crucial in capturing the bound restitutive presuppositions for both the lexical causative and inchoative.

The second assumption concerns the semantics of the quantificational DP. Rather than a generalized quantifier of type $<<e,t>,t>$ as in Barwise and Cooper (1981), I assume that a quantificational DP is instead of type $<<e,<s,t>>,<s,t>>$ (Schein, 1993; Bale, 2007; Kelly, 2013). That is, it takes a function from individuals to predicates of events, and returns a predicate of events. This change is necessary to allow for quantificational DPs to combine with verbal denotations in an event-based semantics. This is, of course, not without its issues. Champollion (2015), for example, provides a good overview of the issues involved in the interaction of quantifiers and the event argument, showing that once the event argument has been existentially bound, the event quantifier must always take low scope in relation to other quantifiers. In standard approaches with event-based semantics (e.g. Kratzer, 1996; Krifka, 1998; Landman, 2000, a.o.), the event variable is bound after all arguments have combined with the verb via EXISTENTIAL CLOSURE (e.g. Diesing, 1992), giving the existential event quantifier highest scope. Champollion (2015) proposes to bind the event variable at the lexical level, ensuring the event quantifier always scopes low with respect to other DP quantifiers. Exploring this approach is, unfortunately, out of the scope of this dissertation and so I set it aside here, adopting Bale (2007) and Kelly's (2013) approach for the discussion in this chapter.[13]

[13]In fact, in Schein's (1993) sub-events approach where there is an existential quantifier over sub-events in the scope of the quantifiers over individuals, this problem is mitigated. Schein's (1993) semantics for the quantificational DP *every girl*, for example, will have the semantics below,

A third assumption I reject is that lexical causatives and inchoatives both share the same result state core, a small clause consisting of the change-of-state verb root and its holder argument, and an abstract eventive predicate BECOME. Rather, to capture the difference in the number of restitutive presuppositions between the two variants, I suggest that the lexical causative has a more articulated result state constituent than the inchoative, providing more attachment sites for *again* and producing more restitutive presuppositions, while also lacking BECOME. Specifically, the lexical causative has an additional stative verbalizing little v within its result state constituent; following Cuervo (2003, 2014), Harley (1995, 2003), and Folli and Harley (2007), I label this v_{BE}. In contrast, inchoatives lack this additional stative layer, instead being verbalized directly by a little v that introduces the eventive BECOME predicate, which I label v_{BECOME}. I illustrate first with the structure of the lexical causative and the semantic denotations of each syntactic node as below, utilizing Kratzer's (2005) semantics for CAUSE.[14]

(3.16) Lexical Causative



with the event variable ranging over sum events and $\sqsubseteq$ being the part-of relation.

(i) $[\![\text{every girl}]\!]$: $\lambda P.\lambda e.\forall x[\text{GIRL}(x) \rightarrow \exists e'[e' \sqsubseteq e \wedge P(x)(e')]]$

[14]I omit the external argument introducing VOICEP here since it is not crucial to the discussion.

(3.17) a. $[\![\sqrt{\text{OPEN}}]\!]$: $\lambda e_s.\text{OPEN}(x,e_s)$

b. $[\![\sqrt{\text{OPEN}}_1]\!]$: $\lambda x.\lambda e_s.\text{OPEN}(x,e_s)$

c. $[\![v_{\text{BE}}]\!]$: $\lambda P_{<e,st>}.\lambda x.\lambda e_s.P(x)(e_s)$

d. $[\![v_{\text{BE}1}]\!]$: $\lambda x.\lambda e_s.\text{OPEN}(x,e_s)$

e. $[\![\text{a door}]\!]$: $\lambda P_{<e,st>}.\lambda e.\exists x[\text{DOOR}(x) \wedge P(x)(e)]$

f. $[\![v_{\text{BE}}P]\!]$: $\lambda e_s.\exists x[\text{DOOR}(x) \wedge \text{OPEN}(x,e_s)]$

g. $[\![v_{\text{CAUSE}}]\!]$: $\lambda V_{<s,t>}.\lambda e.\exists e_s[\text{CAUSE}(e,e_s) \wedge V(e_s)]$

h. $[\![v_{\text{CAUSE}}P]\!]$: $\lambda e.\exists e_s[\text{CAUSE}(e,e_s) \wedge \exists x[\text{DOOR}(x) \wedge \text{OPEN}(x,e_s)]]$

We can now see how the lexical causative allows for two restitutive presuppositions where a state of a door being open is restored. If *again* is of type $<<s,t>,<s,t>>$ with the semantics given in (3.5) (Bale, 2007), then in the lexical causative there are two attachment sites for *again* that produce a restitutive presupposition. The first is when it attaches directly to the root of type $<s,t>$, as proposed previously by Pylkkänen (2002) and Beavers and Koontz-Garboden (2020). In (3.17a), the root contains a variable which is abstracted over and later becomes bound by the existential quantifier associated with the indefinite *a door*. This derives a bound presupposition, where there is a bound variable in the presupposition of *again* such that the entity mapped to that variable must be the same one as in the asserted event. Crucially, we see that the existential quantifier is not contained within *again*'s presupposition in (3.18).

(3.18) Bound restitutive presupposition:
$\exists {e^1}_s \exists {e^2}_s[{e^1}_s \prec {e^2}_s \prec e_s \wedge \text{OPEN}(x,{e^1}_s) \wedge \neg\text{OPEN}(x,{e^2}_s)]$

However, a second attachment site is available, made possible by the fact that the indefinite DP is introduced by a stative verbalizing head v_{BE}, which introduces an argument as well as an event variable ranging over states in (3.17c).[15]

[15]The denotation of v_{BE} may alternatively simply be a type-neutral identity function, which has

A quantificational DP like *a door* will then take the constituent consisting of v_{BE} and the root whose variable has been abstracted over as an argument, producing a stative constituent v_{BE}P of type <*s*,*t*>. If *again* attaches to v_{BE}P, the existential quantifier associated with the indefinite will be interpreted within *again*'s presupposition, producing a quantificational restitutive presupposition and allowing a different entity to satisfy *again*'s presupposition. This is illustrated in (3.19). v_{CAUSE}, denoting a causal relation between two predicates of events and hence of type <<*s*,*t*>,<*s*,*t*>> (Kratzer, 2005), then takes v_{BE}P as a semantic argument, producing another type <*s*,*t*> constituent that is *eventive*. Attaching *again* to v_{CAUSE}P produces a repetitive presupposition, which I will set aside here.

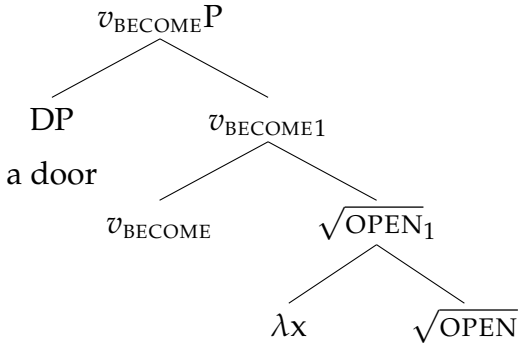
(3.19) Quantificational restitutive presupposition:
$\exists e^1{}_s \exists e^2{}_s [e^1{}_s \prec e^2{}_s \prec e_s \wedge \exists x[\text{DOOR}(x) \wedge \text{OPEN}(x,e^1{}_s)] \wedge \neg\exists x[\text{DOOR}(x) \wedge \text{OPEN}(x,e^2{}_s)]]$

I next show the analysis of an inchoative built on the same root $\sqrt{\text{OPEN}}$, with the structure and semantic denotations below. As noted above, I assume that the inchoative lacks a stative verbalizing v_{BE}, and the root is instead directly verbalized by v_{BECOME} introducing change-of-state semantics.[16]

been proposed in English HAVE-constructions (Myler, 2014). Analytically, this would achieve the same result but I retain the denotation I provided here to distinguish it from an expletive VOICE head with the denotation of a type-neutral identity function that I utilize in chapter 2. Ultimately, it might be the case that both are type-neutral identity functions but VOICE combines with a *v*P while v_{BE} combines with an acategorial root i.e., the difference is syntactic rather than semantic.

[16]I assume here that inchoatives in English lack VOICEP altogether, as do Alexiadou et al. (2015). Note that in Schäfer (2008) and Alexiadou et al. (2015), causatives and inchoatives both involve CAUSE and the alternation is analyzed as a VOICE alternation, where causatives contain thematic VOICE, assigning a thematic role and introducing the external argument, while inchoatives contain expletive VOICE that only introduces the external argument. I will maintain in my analysis that the alternation requires both CAUSE and BECOME, and they crucially differ in the syntactic category of the constituent they select i.e., a v_{BE}P for causatives and an acategorial root for

(3.20) Inchoative



(3.21) a. $[\![\sqrt{\text{OPEN}}]\!]$: $\lambda e_s.\text{OPEN}(x,e_s)$

b. $[\![\sqrt{\text{OPEN}}_1]\!]$: $\lambda x.\lambda e_s.\text{OPEN}(x,e_s)$

c. $[\![v_{\text{BECOME}}]\!]$: $\lambda P_{<e,st>}.\lambda x.\lambda e.\exists e_s[\text{BECOME}(e,e_s) \wedge P(x)(e_s)]$

d. $[\![v_{\text{BECOME1}}]\!]$: $\lambda x.\lambda e.\exists e_s[\text{BECOME}(e,e_s) \wedge \text{OPEN}(x,e_s)]$

e. $[\![\text{a door}]\!]$: $\lambda P_{<e,st>}.\lambda e.\exists x[\text{DOOR}(x) \wedge P(x)(e)]$

f. $[\![v_{\text{BECOME}}\text{P}]\!]$: $\lambda e.\exists x[\text{DOOR}(x) \wedge \exists e_s[\text{BECOME}(e,e_s) \wedge \text{OPEN}(x,e_s)]]$

As with the lexical causative, the root itself is of the correct semantic type for *again* to attach to, producing a presupposition containing a variable to be abstracted over and bound by the indefinite DP, identical to (3.18). Crucially, however, instead of being introduced by a stative v_{BE}, the indefinite DP is instead introduced by the eventive v_{BECOME} denoting change-of-state semantics (Dowty, 1979; Beavers and Koontz-Garboden, 2020, a.o.). In the inchoative then, the only other attachment site for *again* apart from the verbal root is at v_{BECOME}P. Attaching here will allow the existential quantifier associated with the DP to be interpreted in *again*'s presupposition but crucially, the presupposed prior event must be *eventive* rather than stative. This accounts for the observation that a quantificational presupposition must necessarily be *repetitive* and not restitutive for the inchoative, as demonstrated in (3.12) and (3.13) and translated formally in (3.22).

inchoatives.

(3.22) Quantificational repetitive presupposition (inchoative):
$\exists e^1 \exists e^2 [e^1 \prec e^2 \prec e \wedge \exists x [\textsc{door}(x) \wedge \exists e^3{}_s [\underline{\textsc{become}(e^1, e^3{}_s)} \wedge \textsc{open}(x, e^3{}_s)]]$
$\wedge \neg \exists x [\textsc{door}(x) \wedge \exists e^4{}_s [\underline{\textsc{become}(e^2, e^4{}_s)} \wedge \textsc{open}(x, e^4{}_s)]]]$

The crux of the analysis then lies in the fact that there is a difference in the amount of functional structure that produces a stative constituent for *again* to attach; the lexical causative has two stative attachment sites, one containing a bound variable and the other containing the quantifier, while the inchoative only has one that contains a bound variable.

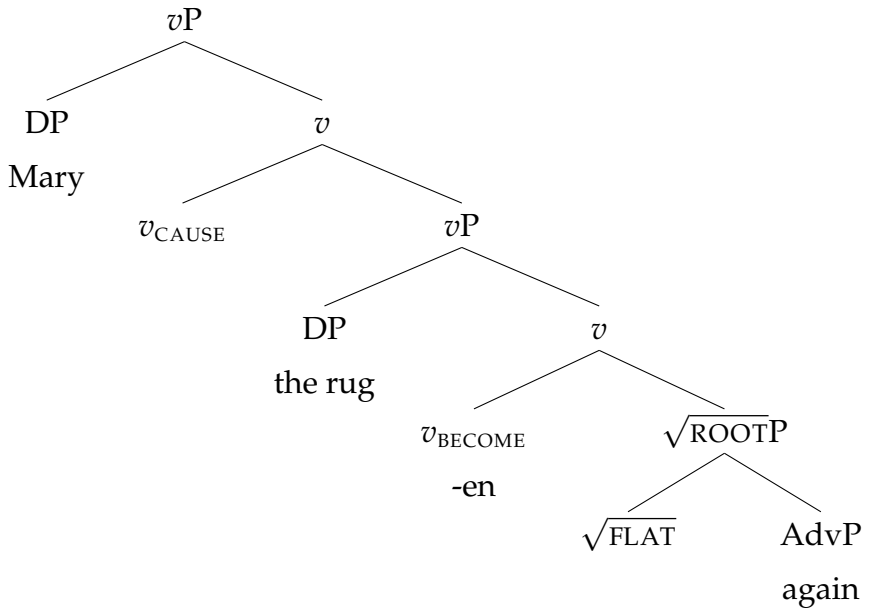
I next discuss related proposals suggesting that causatives contain a BECOME component in addition to CAUSE. I show that postulating a BECOME component in English lexical causatives ultimately creates problems for the restitutive ambiguity differences observed between lexical causatives and inchoatives. This supports analyses like Harley's (2012a), where lexical causatives and inchoatives do not share a common syntactic component and instead contain different verbalizing *v* heads.

3.3.2 On the Presence of BECOME: Beavers and Koontz-Garboden (2020)

Beavers and Koontz-Garboden (2020) adopt a syntactic event-structure template, where the event template introduces various templatic meanings and roots are inserted into these templates like in (3.3), much like the structures I assume for the analysis of the restitutive ambiguity. I focus on the event structure template they provide for what they call Property Concept (PC) verbs, which denote simple states with no entailments of change, in contrast to what they call result roots, which do entail change (such as the verb classes discussed in chapter 2). Examples of such verb roots include simple underived verbs like *open* and *dry*, and also verbs with overt *-en* morphology like *flatten* and *straighten* (Levin, 1993), which we are concerned with here in this chapter and which I have labeled simply as

change-of-state verbs.[17] Their analysis for the verb *flatten* producing a restitutive presupposition with *again* is given below (Beavers and Koontz-Garboden, 2020, pp. 17).

(3.23)



Their assumed event structure template and where *again* attaches shares a similarity with my proposed analysis, namely that *again* directly can modify a root to produce the restitutive presupposition. However, they assume PC roots denote functions from individuals to predicates of events. Given that, Beavers and Koontz-Garboden (2020) suggest that the denotation of *again* is of type $<<e,<s,t>>,<e,<s,t>>>$ instead, a departure from most standard analyses of the semantics of *again* (von Stechow, 1996; Beck and Johnson, 2004; Bale, 2007, a.o.).

(3.24) ⟦again⟧: $\lambda P.\lambda x.\lambda e.P(x)(e)$
PRESUPPOSITION: $\exists e'[e' \prec e \wedge P(x)(e')]$

[17] I will make a further distinction between change-of-state and degree achievement verb roots in a later section, showing that they behave differently with *again* and necessitate a different analysis.

One might argue that their denotation is simply a matter of implementation based on their syntactic and semantic assumptions and since it can capture the restitutive presupposition, the difference in implementation is inconsequential. It is quite clear, however, that there are empirical consequences in regards to the restitutive ambiguity. If the DP object *the rug* in their structure above is replaced with the indefinite *a rug*, then there would only be two attachment sites given their semantics for *again*. One is directly to the root as illustrated in (3.23). Since for them *again* is of type $<<e,<s,t>>,<e,<s,t>>>$, attaching to the root produces the bound restitutive presupposition since there is an individual variable that will be bound by the quantificational DP introduced in the specifier of v_{BECOME}. *Again*'s presupposition will therefore fall under the scope of the existential quantifier associated with the DP.

However, we see that there is simply no other *stative* attachment site in their structure where the existential quantifier associated with the quantificational DP will be within the scope of *again*. As Beavers and Koontz-Garboden (2020) note, the other available attachment site is after v_{BECOME} combines with $\sqrt{\text{ROOT}}$P, given that that is the only type $<e,<s,t>>$ constituent available. v_{BECOME}P, the constituent that would contain an existential quantifier within the indefinite DP introduced by v_{BECOME}, would be a type $<<s,t>,<s,t>>$ constituent and given that they assign a type of $<<e,<s,t>>,<e,<s,t>>>$ to *again*, it is not of the right semantic type for *again* to attach. Note that even if v_{BECOME}P is modified so that it is the right semantic type for *again* modification, it will only ever produce a *repetitive* presupposition and not a restitutive one. In other words, the structure and semantics Beavers and Koontz-Garboden (2020) assume simply has no way of capturing a quantificational restitutive presupposition, much like the small clause analyses reviewed in an earlier section (e.g Pylkkänen, 2002; Harley, 2012a).

We might now address whether lexical causatives contain a BECOME component at all, which I have so far assumed to be absent. Since lexical causatives

seem to entail the semantics of BECOME such that an entity underwent a transition from not holding a state to holding a state, one might argue that BECOME should also be represented in the semantics of lexical causatives. I will argue that there is simply no BECOME and lexical causatives contain only CAUSE + BE. First, note that I adopted Beavers and Koontz-Garboden's (2019) semantics for BECOME as repeated below, where it takes an individual as its second argument.

(3.25) $[\![v_{\text{BECOME}}]\!]$: $\lambda P_{<e,st>}.\lambda x.\lambda e.\exists e_s[\text{BECOME}(e,e_s) \wedge P(x)(e_s)]$

We have seen in (3.16), v_{BE} is crucial to capture a quantitative restitutive presupposition. v_{BE} combines with the quantificational DP as its second argument, producing a type $<s,t>$ constituent. This is, however, not the right semantic type to serve as the argument of v_{BECOME}. There are two logical possibilities here for including v_{BECOME} in the structure in (3.16). One is to say that v_{BE} does not introduce the quantificational DP in its specifier. After combining with the verb root, it combines directly with v_{BECOME} and there is no type-theoretic mismatch. The quantificational DP is then introduced in the specifier of v_{BECOME}. However, this runs into the same issue as Beavers and Koontz-Garboden's (2020) analysis: there is simply no way to capture a quantificational restitutive presupposition, since the only attachment site where the existential quantifier is within the scope of *again* would be eventive and not stative.

A second possibility is to not treat v_{BECOME} as introducing an entity argument. Instead, it is a relation between an event and a state of type $<<s,t>,<s,t>>$ (as proposed by Dowty, 1976, 1979), analogous to CAUSE (Kratzer, 2005). In this way, it will be able to directly take v_{BE}P as an argument while retaining the same attachment sites for *again* within v_{BE}P. However, this would create issues for the analysis of the inchoative. In the inchoative, this version of v_{BECOME} verbalizes the verb root which contains a variable and produces a type $<s,t>$ constituent. There seems to be no straightforward way to introduce the holder argument in this case. One could, for example, suggest that it is introduced by a higher VOICE

head via EVENT IDENTIFICATION (Kratzer, 1996), but there is no way of ensuring that the lambda abstracted variable in VOICE is semantically identical to the variable within the verb root, as there is nothing in the EVENT IDENTIFICATION rule that abstracts over the variable in the root. In addition, one might question the existence of a VOICE head in the inchoative (assumed to be absent by Folli and Harley, 2005; Alexiadou et al., 2015, a.o.), since this would mean that accusative case can be assigned and the holder argument need not raise to receive case from a higher case assigning head.[18] The second option is to allow the holder argument to be combined with the root after the semantic component lambda abstracts over the variable within the root via v_{BE}, identical to the lexical causative. This, however, would create a stative constituent in the inchoative containing the existential quantifier that can be within the scope of *again*, predicting that a quantificational restitutive presupposition should be possible, contrary to fact. There is hence no straightforward way of incorporating a BECOME component into the semantics of the lexical causative without creating problems elsewhere in the semantic computation.

Independent of the proposed analysis and the issues it faces with trying to incorporate a BECOME component in the lexical causative, there is also evidence

[18]One could also assume that there is a flavor of expletive VOICE that introduces an external argument, assigns no semantic role to the argument and is thus an identity function, and also does not assign accusative case (Schäfer, 2008; Alexiadou et al., 2015; Myler, 2014; Wood and Marantz, 2017). If LAMBDA ABSTRACTION applies to bind the unbound variable of the root with a lambda binder prior to combining with VOICE, the denotation of v_{BECOME}P can then be passed upwards by expletive VOICE, and the root's argument position is then saturated by the argument VOICE introduces. Alexiadou et al. (2015) propose this flavor of VOICE for Greek inchoatives because they are marked with non-active morphology; no such morphological marking is observable in English, which leads them to suggest that English lacks such a flavor of VOICE (Alexiadou et al., 2015, pp. 97). If we take the lack of observable morphology to reflect the lack of a VOICE head as the null hypothesis, then the option of having VOICE introduce the holder argument of the root would be unavailable.

from other domains that suggest the lexical causative does not contain a second eventive BECOME. First, as Pylkkänen (2002) notes, if there is a second eventive component in lexical causatives apart from CAUSE, one might expect it to be available for manner adverbial modification. However, in (3.26a), *grumpily* can only modify John's causing action and not Bill's awakening; in contrast, in the inchoative in (3.26b), the holder of the result state Bill can be modified by *grumpily* (Pylkkänen, 2002, pp. 180). Hence, she takes this to mean that there is no intermediate BECOME event in the lexical causative and the only eventive component available for modification is CAUSE, which directly selects for an acategorial stative root. In the inchoative, BECOME is syntactically represented and available for modification, in line with analyses like Folli and Harley (2005) regarding the difference between lexical causatives and inchoatives.

(3.26) a. John awoke Bill grumpily. (False if John isn't grumpy).
b. Bill awoke grumpily. (False if Bill isn't grumpy)

Harley (2012a), in addition, suggests that Fodor's (1970) criticisms of a lexical decomposition analysis of controversial cases like *kill* as CAUSE + TO DIE (eventive) in fact support an analysis where the lower result constituent is stative rather than eventive. Fodor (1970) argues that if the lexical decomposition is right, it is mysterious why, for example, the object of a change-of-state verb cannot control a PRO in an adjoined gerund clause, when a regular sentential subject as well as the object of a periphrastic causative, which is the subject of a lower VP, can do so as shown in (3.27). Furthermore, Fodor (1970) questions why the lower eventive portion of a lexical causative cannot antecede *do-so* ellipsis when the periphrastic causative permits such ellipsis. In (3.28), the pronoun in the second clause of the periphrastic causative can refer to both the matrix subject and the subject of the lower VP, while in the lexical causative a pronoun can only refer to the matrix subject and not the object of the change-of-state verb. These facts are all unex-

pected if lexical causatives are decomposed as CAUSE + BECOME + RESULT.

(3.27) a. The milk$_i$ spoiled by PRO$_i$ by sitting in the sun.
b. John$_i$ caused the milk$_j$ to spoil by PRO$_{i/j}$ sitting in the sun.
c. John$_i$ spoiled the milk$_j$ by PRO$_{i/*j}$ sitting in the sun.

(3.28) a. John caused Mary to die and it surprised me that he/she did so [= CAUSE TO DIE / DIED].
b. * John killed Mary and it surprised me that he/*she did so. [= CAUSE TO DIE / *DIED].

However, Harley (2012a) shows that if the lexical causative is analyzed as CAUSE + RESULT (stative) instead of CAUSE + BECOME + RESULT, the above facts become expected. The objects of lexical causatives pattern with subjects of stative predicates in not allowing control of a PRO within an adjoined gerund clause. Stative small clauses also cannot serve as the antecedent of *do-so* ellipsis in English, which requires a full eventive VP. These are shown in (3.29) and (3.30). Note that both control of a gerund PRO and *do-so* ellipsis become licit once the stative small clause is replaced with an overt eventive *become*, showing that small clause subjects cannot control a gerund PRO and that small clauses cannot antecede *do-so* ellipsis.

(3.29) a. * Mary$_i$ was happy by PRO$_i$ singing.
b. John$_i$ made [Mary$_j$ happy] by PRO$_{i/*j}$ singing.
c. John$_i$ made [Mary$_j$ become happy] by PRO$_{i/j}$ singing.

(3.30) a. John$_i$ made [Mary$_j$ happy] and it surprised me that he$_i$/*she$_j$ did so.
b. John$_i$ made [Mary$_j$ become happy] and it surprised me that he$_i$/she$_j$ did so.

To summarize, we have seen that the proposed analysis here shares a similarity with Beavers and Koontz-Garboden (2020) (also Pylkkänen, 2002) in that *again* can attach to and directly modify a root. The main difference lies in the way I implement the semantics of the verbal root and also to the amount of functional structure assigned to the lexical causative. I showed here in this section that Beavers and Koontz-Garboden's (2020) analysis, which postulates a BECOME predicate for lexical causatives, undergenerates in not predicting a quantificational restitutive presupposition and also faces empirical challenges in regards to other syntactic processes like controlling a gerund PRO and *do-so* ellipsis.

3.4 Different Theories of Restitutive *Again*

While the repetitive presupposition of *again* has found general analytical consensus in the literature, the restitutive presupposition has been much more controversial, leading to various theories of its semantics. In this section, I consider some alternative theories of the semantics of *again*. I show that a theory that postulates two different lexical entries to account for the repetitive-restitutive ambiguity faces empirical challenges that are difficult to overcome. I then discuss different formulations of *again*'s semantics within scope-based accounts and demonstrate with quantificational holder arguments that a semantics assigned to *again* like Bale's (2007) captures the right range of presuppositions in regards to the restitutive ambiguity discussed in this chapter.

3.4.1 Lexical Ambiguity Theories: Jäger and Blutner (2003) and Fabricius-Hansen (2001)

Jäger and Blutner (2003) represent an influential approach arguing against a decompositional and scope-based analysis to the restitutive presuppositions exhibited by *again*. They observe that a decomositional approach in the spirit of von

Stechow (1995, 1996) leads to an overgeneration of repetitive and restitutive presuppositions. In particular, they claim that a repetitive presupposition where *again* scopes over BECOME but not CAUSE is unavailable but predicted by von Stechow's (1995, 1996) analysis (contra Beavers and Koontz-Garboden, 2020, who claim such a presupposition is possible as shown in (3.3) and (3.4)).

(3.31) [$_S$ John CAUSE [$_S$ again [$_S$ BECOME [$_S$ the window open]]]]

Setting aside this particular prediction about repetitive presuppositions, Jäger and Blutner (2003) claim as well that a decompositional analysis faces empirical challenges with restitutive presuppositions. Like what I discussed in the earlier sections of the chapter, they acknowledge that with lexical causatives, an ambiguity arises in restitutive presuppositions when the object of a change-of-state verb is quantificational (such as an indefinite), producing a bound and quantificational restitutive presupposition.

(3.32) a. [$_S$ John CAUSE [$_S$ BECOME [$_S$ again [$_S$ a window open]]]]]

b. [$_S$ [a window]$_x$ [$_S$ John CAUSE [$_S$ BECOME [$_S$ again [$_S$ x open]]]]]]

A crucial example Jäger and Blutner (2003) claim represents a challenge for decompositional approaches comes from verbs of motion that occur with goal phrases, such as *to settle* and *to enter*. Suggesting that these verbs have a subject control structure under a decompositional approach, they go on to show that there is only one restitutive presupposition predicted to be available when the subjects of these verbs are quantificational, namely the bound one in (3.33a). There should be no quantificational restitutive presupposition available given the subject-control structure; this is contrary to fact as such a presupposition does exist, schematized in (3.33b) and shown by the context in (3.34). In (3.34), the sentence modified by *again* is true and *again*'s presupposition is satisfied even if no Delaware had settled in New Jersey before and no Delaware lived there twice.[19]

[19]Note that the following example touches on sensitive and traumatic issues surrounding colo-

(3.33) a. [$_S$ [A Delaware]$_x$ [$_S$ CAUSE BECOME [$_S$ again [$_S$ x live in New Jersey]]]]

b. [$_S$ CAUSE BECOME [$_S$ again [$_S$ A Delaware live in New Jersey]]]

(3.34) CONTEXT: The Delaware tribe was created in New Jersey at the beginning of time. They never left the area until 200 years ago when they were forced into a reservation in Oklahoma. Recently, a member of the tribe moved to the home of his ancestors in New Jersey.
✓ A Delaware settled in New Jersey again.

On the basis of the availability of quantificational restitutive presuppositions satisfied by contexts like (3.34) and the assumption that verbs like *to settle* and *to enter* have subject control structures, Jäger and Blutner (2003) go on to reject the scope analysis of *again*-ambiguities and propose that *again* is instead lexically polysemous. There are, however, two independent ways of arguing against their lexical polysemy account. First, the crucial assumption that the argument is based on is that *to settle* and *to enter* have subject control structures. As Tomioka (2006) notes, these verbs fall into the class of verbs of motion, which Levin and Rappaport-Hovav (1992) argue display unaccusative behavior when they appear with goal phrases. Levin and Rappaport-Hovav (1992) cite cross-linguistic evidence from Ialian; in Italian, auxiliary selection and *ne*-cliticization indicate unaccusativity. When activity verbs appear with goal phrases, they pattern as unaccusatives in regards to these two diagnostics.

nialism and forced removal and genocide of Native American groups, which are inappropriate and should be avoided in the construction of linguistic examples. I reproduce Jäger and Blutner's (2003) example faithfully here, but do not agree with the use of collective trauma as the topic for a constructed linguistic example. I thank Heidi Harley (personal communication) for raising her discomfort with this example and reminding me of the responsibility linguists have in regards to the representation of historically underrepresented communities in linguistic examples.

(3.35) a. Ugo ha corso meglio ieri.
'Ugo ran better than yesterday.' (auxiliary *essere* 'be' not selected)

b. Ugo **è** corso a casa.
'Ugo ran home.' (auxiliary *essere* 'be' selected)

(3.36) a. * **Ne** hanno corso due.
'Two of them ran.'

b. **Ne** sono corsi due a casa.
'Two of them ran home.'

Levin and Rappaport-Hovav (1992) extend the argument to English, arguing that verbs of motion behave as unaccusatives with goal phrases. This means that in Jäger and Blutner's (2003) example with *to settle*, the surface subject *a Delaware* is really an underlying subject of the lower state *in New Jersey*. If so, then there is no issue in deriving the presupposition where *a Delaware* is within the scope of *again*. In the semantic component, the quantificational DP *a Delaware*, which presumably has raised to subject position to satisfy T(ense)'s EPP feature and to check its abstract case requirement, reconstructs into its base position, which is the goal phrase that *again* attaches to. In this case, the existential quantifier will fall within the scope of *again*. As we have seen in the example with the passive of a lexical causative in (3.14), such reconstruction is independently available in any case and so Jäger and Blutner's (2003) example does not make a case against a decompositional analysis once verbs like *to settle* are analyzed as underlying unaccusatives.

A second argument against their account comes from word order and interpretive facts. Simplifying somewhat, Jäger and Blutner (2003) suggest that *again* should be lexically ambiguous, deriving the restitutive presupposition via a function RESULT. Roughly speaking, a state s is in the interpretation of ϕ if there is an event e by which s stands in some relation to represented by R, and e is also in

the interpretation of ϕ. In lexical causatives, R could presumably be the relation CAUSE.[20] The meaning postulate in (3.39) then delivers the result state of a lexical causative when restitutive *again* is attached to a VP.

(3.37) a. $[\![\text{again}_{repetitive}]\!]$: λp.λe.p(e): $\exists$e'[e' $\prec$ e $\wedge$ p(e')]

b. $[\![\text{again}_{restitutive}]\!]$: λp.λe.p(e): $\exists$s[s $\prec$ e $\wedge$ RESULT(p)(s)]

(3.38) s $\in [\![\text{RESULT}(\phi)]\!]$ iff $\exists$eRs: e $\in [\![\phi]\!]$

(3.39) $\forall$y.$\forall$x.$\forall$s(IS-P(x,y) $\longleftrightarrow$ RESULT(P(x,y))(s))

The repetitive-restitutive ambiguity exhibited in sentences with sentence-final *again* boils down to a different choice of *again*. However, this raises questions of word-order effects, as noted by von Stechow (1995, 1996) for German, and which can be replicated for English. When *again* attaches to the right of a sentence, a repetitive-restitutive ambiguity arises but when it attaches leftward sentence-initially or in a pre-verbal position following the subject, only a repetitive presupposition is possible (Beck and Johnson, 2004).

(3.40) a. Mary opened the door again.

1. Mary previously opened the door and she opened it again.
2. The door was previously open and Mary opened it again.

b. Again, Mary opened the door. / Mary again opened the door.

1. Mary previously opened the door and she opened it again.
2. # The door was previously open and Mary opened it again.

[20] I abstract away from Jäger and Blutner's (2003) exact analysis, which includes the predicate OBTAIN(e) and OBTAIN(s), meant to account for the fact that the intended event or result state need not obtain in reality. Since the OBTAIN predicate is not crucial to the discussion, I omit it here for perspicuity.

If the repetitive-restitutive ambiguity is reduced to a choice between two variants of a lexically ambiguous *again*, one would have to claim that when *again* adjoins leftward to a sentence-initial or pre-verbal position, only the repetitive *again* can be selected. Given Jäger and Blutner's (2003) analysis of *again*, it is hard to see what the basis of this claim could be, since there is nothing in the semantics that mandates this. In other words, the facts regarding leftward attachment of *again* would simply need to be stipulated in their analysis, while a scope-based analysis (von Stechow, 1995, 1996; Beck and Johnson, 2004; Bale, 2007) only needs to assume that the different positions within a sentence correspond to different attachment sites within the syntactic structure, an assumption that is standard in the literature.

More seriously, Bale (2007) also shows that there are other interpretive effects that cause issues for analyses like Jäger and Blutner's (2003). The observation is that when rightward attaching *again* attaches outside of an adverbial modifier, restitutive presuppositions are blocked (Bale, 2007, pp. 462). The key element of these examples is in the context, which supports only a stative event *excluding* the semantics of the adverbial modifier in the assertion, blocking both the repetitive and restitutive presupposition.

(3.41) CONTEXT: The rocket was built two days ago and launched into space yesterday.

a. ✓ At two o'clock today, it entered the Earth's atmosphere again.

b. # It entered the Earth's atmosphere at two o'clock again.

(3.42) CONTEXT: The pocket watch Seymour received for his birthday had always been open due to a manufacturing error. Yesterday he got the watch fixed and closed it for the first time.

a. ✓ At school, he opened it again to show his friends.

b. # He opened it at school again to show his friends.

The scope analysis can straightforwardly account for the fact that the (b) sentences are semantically anomalous. Whether it attaches to the result state of the VP spelled out as *enter* or whether it attaches at the sentence level including the agent, the adverbial modifier must always fall within the scope of *again*, meaning that the context must provide an event description including the adverbial modifier, which is not the case in the above contexts. Conversely, as Bale (2007) notes, a theory like Jäger and Blutner's (2003) has no straightforward way of accounting for these cases. Since the result state is extracted from an eventive VP via a meaning postulate for restitutive *again*, there is no reason why the restitutive presupposition excluding the adverbial modifier is blocked when rightward-attaching *again* appears to the right of adverbial modifiers. Jäger and Blutner (2003) would have to claim that in (3.41) and (3.42), *the rocket being in Earth's atmosphere* is a result of *the rocket entered the Earth's atmosphere* but not *the rocket entered the Earth's atmosphere at two o'clock*, and *the watch being open* is a result of *Seymour opened the watch* but not *Seymour opened the watch at school*. This is clearly undesirable since *the rocket entered the Earth's atmosphere at two o'clock* entails *the rocket entered the Earth's atmosphere* and *Seymour opened the watch at school* entails *Seymour opened the watch*. Therefore, *again* can neither presuppose a subpart of its complement's logical form nor presuppose propositions that are analytic consequences of its complement's interpretation, contra Jäger and Blutner (2003) (Bale, 2007, pp. 463).

A second proposal about the restitutive presupposition that postulates lexical ambiguity is that of Fabricius-Hansen (2001). She observes that with verbs that have result states, *again* triggers a presupposition that the *reverse* of the result state has happened before the state is restored in the assertion. This was already discussed earlier in the contrast between (3.7b) and (3.8), where restitutive presuppositions require the reversal of the result state; I reproduce the relevant examples below.

(3.43) CONTEXT: There are two doors, door A and door B. Door A was built

open and door B built closed. The wind blows door A shut. Mary comes by and opens door B so...
✓ Mary opened a door again.

(3.44) CONTEXT: John is in a room with two windows. One window is open and the other is closed. John opens the closed window so...
John opened a window again.

Because restitutive interpretations require reversal, Fabricius-Hansen (2001) suggests they have to do with reversal of a state rather than repetition of a state, and calls this a *counterdirectional* presupposition instead. She provides the following semantics for counterdirectional *again*, where P_c is a property characterizing the reverse of a property P, and $res(ult)_{Pc}(e')$ and $pre(state)_p(e)$ are the two successive states that have to obtain in order for P(e) to hold.

(3.45) $[\![again_{counterdirectional}]\!]$: $\lambda P.\lambda e.P(e)$
PRESUPPOSITION: $\exists e'[e' \prec e \wedge P_c(e') \wedge res_{Pc}(e') = pre_P(e)]$

A lexical ambiguity account that analyzes the restitutive presupposition as counterdirectional predicts that an ambiguity is possible only when a predicate can be connected to a counterdirectional predicate (Patel-Grosz and Beck, 2019). What exactly counts as a counterdirectional for a particular predicate can be conceptualized in two possible ways. For example, for an intransitive predicate like *come*, which denotes directed motion from a source to a goal such that *α moves to β from γ*, a counterdirectional predicate is made available by reversing the direction such that *α moves from γ from β*. For transitive predicates like *love* that denote a binary relation between two individuals such that *α feels β towards γ*, a counterdirectional predicate is made available via subject-object role reversal such that *γ feels β towards α* (Patel-Grosz and Beck, 2019).

As Patel-Grosz and Beck (2019) note, a problem with deciding between a counterdiredctional and a scope-based account of restitutive presuppositions is

difficult because the two accounts of how restitutive presuppositions are derived often describe the exact same situations. For example, a sentence like *Leo jumped up again* can be interpreted as a state of Leo being up being restored from him not being up by jumping as predicted by the scope analysis, or as Leo carrying out a preceding reverse event of sitting down which caused him to not be up, and then restoring the state of being up. Thus, predicates with result states do not permit the two analyses to be teased apart.

However, there are predicates that do, namely directional predicates that lack result states (Beck and Gergel, 2015). Predicates like *calling someone*, for example, entails directionality and a counterdirectional predicate should be available by reversing the directionality of the calling event even in the absence of a result state. A counterdirectional analysis of *again* predicts that such predicates should be modifiable by *again* to produce a counterdirectional presupposition. While it is possible in Middle English and Early Modern English for *again* to have a counterdirectional presupposition, it is no longer possible in modern English and can only be expressed with counterdirectional adverbs like *back*, reflecting a diachronic change with consequences for analyses of the synchronic grammar (Patel-Grosz and Beck, 2019, pp. 7).

(3.46) a. Huanne he þerin geþ: ... huan he comþ ayen: ...
when he therein goes: ... when he comes again: ...
'he returns' (Middle English)

b. Tis like people that talk in theire sleep, nothing interupts them but talking to them again [...]
'but replying to them / but talking back to them'
(Early Modern English)

(3.47) CONTEXT: Leo calls Anne and they talked for an hour. Anne had to go to the restroom so she hung up. Ten minutes later, she calls Leo.

a. ✓ Anne called Leo back.

b. # Anne called Leo again.

On the other hand, a scope ambiguity analysis can presumably account for such cases; with predicates like *call someone* simply have no independent stative constituent that *again* can attach to and therefore when modified by *again*, only a repetitive and not a restitutive presupposition is possible. On the basis of these examples then, we can rule out counterdirectional analyses of the restitutive presupposition as they make the wrong predictions in regards to directional predicates with no result state.

3.4.2 Restitutive Presuppositions and Reversal of a Result State: von Stechow (1996) and Bale (2007)

Scope-based analyses of the repetitive-restitutive ambiguity have become widely accepted and used as a diagnostic for probing complex internal structure within the syntactic literature since von Stechow (1995, 1996). For example, in addition to lexical causatives, Beck and Johnson (2004) argued that the availability of a restitutive presupposition with double-object constructions in English supports a decompositional analysis, where there is a small clause headed by an abstract predicate HAVE denoting possession semantics (see also Harley, 2003 for an extended discussion of analyses in the same spirit). Despite the widespread use of *again*-ambiguities as a diagnostic, there is very little discussion on the exact formulation of the semantics of *again* and authors often provide different semantics for *again* without considering the empirical consequences. In this section, I compare the original semantics given for *again* based on German data in von Stechow (1996) (also Dowty, 1976) with that given in Bale (2007) for the English data, arguing that the contexts that satisfy *again*'s presupposition with quantificational holder arguments actually provide a way of distinguishing between these two kinds of analyses.

In von Stechow (1996), the following semantics is assigned to *again*. Effectively, *again* is of semantic type $<<s,t>,<s,t>>$, contributing no semantics in the assertion. Rather, von Stechow (1996, pp. 95-96) proposes that it is a partial function, defined for any two eventualities only if the first is temporally located entirely before the second. Here, MAX(P)(e') stands for a maximal event such that e' is not a proper subpart of a larger event.

(3.48) Let P be a property of eventualities and let e be an eventuality.
⟦again⟧P(e) is defined only if $\exists e'[\text{MAX}(P)(e') \wedge e' \prec e]$
Where defined, ⟦again⟧P(e) iff P(e).

(3.49) MAX is a symbol of type $<<s,t>,<s,t>>$. MAX(P)(e) = 1 iff P(e) = 1 and there is no e' such that e is a proper part of e' and P(e') = 1.

Note that in the presupposition of *again* under von Stechow's analysis, the entity that the state P holds of need not have undergone any intermediate change between when e' and e holds, since there is nothing enforcing this in the formulation of the presupposition. Indeed, this is one of the criticisms levelled at von Stechow's (1996) analysis by Fabricius-Hansen (2001), inspiring her counterdirectional analysis. In her terms, it is not simply the case that *again* presupposes that there was a previous state of P holding of an entity but rather, in an intervening period of time between e' and e, there is another e'' whereby the state P is undone by an opposite process, before P is restored again at e. Fabricius-Hansen (2001) argues that von Stechow's unified meaning of restitutive *again* with its repetitive meaning has no way of capturing this observation, and suggests that he has to resort to some form of pragmatic reasoning about the nature of states such that if a state P holds at two adjacent intervals of time, there must be an intervening interval of time where P does not hold.

Closer examination of von Stechow's analysis, however, reveals that this criticism is not exactly fair. There is, in fact, an element of his analysis that predicts

that the entity must not be in a state P before the asserted event. That comes in the form of Dowty's BECOME operator, which von Stechow (1996) assumes is explicitly represented in the syntax. Formally, Dowty's BECOME is of semantic type <<*s*,*t*>,<*s*,*t*>> and has the meaning as below (von Stechow, 1996, pp. 96), where the pre-state of e is the state that holds immediately before the event e occurs, and the target state is the state reached at the end of the event e. The semantics of a lexical causative like *open* modified by *again* can be formalized as in (3.51).

(3.50) BECOME(P)(e) is true iff e is the smallest event such that P is not true of the pre-state of e but P is true of the target state of e.

(3.51) BECOME(again(λe_s.OPEN(the door,e_s)))(e)

Since *again* attaches to a predicate of states whose argument position has already been saturated, the holder argument of the result state will be represented in *again*'s presupposition as having previously held the state. The BECOME operator will then ensure that the holder argument did not hold a state denoted by the result predicate at the pre-state of the event but will do so at the end state of the event. In this way, von Stechow (1996)'s analysis addresses Fabricius-Hansen's (2001) concern that the result state held by the entity is presupposed to have been undone in some intervening period of time between the presupposed state and the asserted state. For von Stechow (1996), this is not inherent in the meaning of *again* but introduced by BECOME.

In contrast, Bale's formalization of the semantics of *again* as in (3.5), repeated below, explicitly encodes Fabricius-Hansen's (2001) observation that the entity holding the state must have undergone an undoing process such that the state does not hold of the entity in an intervening time interval. This is provided in *again*'s presupposition, such that there is an e^2 temporally located in between e^1 and e where the state is negated.

(3.52) [[again]]: $\lambda P_{<s,t>}.\lambda e.P(e)$
PRESUPPOSITION: $\exists e^1.\exists e^2[e^1 \prec e^2 \prec e \wedge P(e^1) \wedge \underline{\neg P(e^2)}]$

Again, one might wonder if this is simply a matter of different implementations with no empirical consequences. I have already extensively argued that lexical causatives do not embed a BECOME component. Assuming those arguments are on the right track, adopting von Stechow's (1996) semantics of *again* would not capture Fabricius-Hansen's crucial observation that there must be an intervening time interval where the state does not hold of the entity. Independent of these arguments, however, I argue as well that lexical causatives with quantificational holder arguments also allow us to test the predictions of the two different approaches to the semantics of *again*.

Consider now how von Stechow's (1996) analysis of *again* would work with quantificational arguments. It was already shown that in English, quantifiers can scope below *again* based on the availability of a quantificational restitutive presupposition. In von Stechow's (1996) analysis, quantificational arguments with lexical causatives like *open* would have the following presupposition.

(3.53) $\exists e'[\text{MAX}(\lambda e.\exists x.\text{DOOR}(x) \wedge \text{OPEN}(x,e))(e') \wedge e' \prec e]$

Assuming that there is a BECOME component, it would then take the predicate of events returned unchanged by *again* as its argument, producing an assertion that also contains an existential quantifier.

(3.54) $\text{BECOME}(\text{again}(\lambda e_s.\exists x.\text{DOOR}(x) \wedge \text{OPEN}(x,e_s)))(e)$

Crucially, however, there is no requirement that the entity in the presupposition must be the same entity in the assertion, since both would contain an existential quantifier. Assuming a context where the entity that holds the result state is different in the presupposition and assertion, von Stechow's (1996) analysis predicts that a context where nothing happens to the entity that previously held

the state should satisfy *again*'s presupposition, such that in the assertion a different entity can hold the result state as long as it previously did not. The reader might remember that such a context was provided by Lechner et al. (2015) in (3.8), which forms the basis of their claim that a quantifier in object position cannot scope over *again*. The following contexts illustrate this observation. Since the door that is opened in the assertion was previously closed in (3.55), this would satisfy the truth conditions of von Stechow's (1996) BECOME. Crucially, it is unacceptable to use the sentence modified by *again* (Lechner et al., 2015), showing that the prediction made by von Stechow's (1996) analysis is not borne out. Rather, it must be the case that in the intervening period of time between the presupposed event and the asserted event, there is *no entity that the result state holds of* in order for *again*'s presupposition to be satisfied.[21]

(3.55) CONTEXT: There were two doors, door A and door B. Door A was built open and door B built closed. Mary came into the room and opens door B such that there are now two open doors so...
Mary opened a door again.

(3.56) CONTEXT: There were two doors, door A and door B. Door A was built open and door B built closed. A gust of wind came through the room and shut door A such that no doors were open. Then Mary came into the room and opens door B so...
✓ Mary opened a door again.

In contrast, Bale's (2007) semantics for *again* captures this fact. This is because there is negation of the result predicate in an intermediate temporal interval. Should there be an existential quantifier within the event, it will fall within

[21] I thank Ryan Walter Smith (personal communication) for pointing out these examples and their significance to me.

the scope of negation, ensuring that there exists no entity which held the result state in the intervening time period, as shown in (3.19) and repeated below.

(3.57) $\exists e^1{}_s.\exists e^2{}_s[e^1{}_s \prec e^2{}_s \prec e_s \wedge \exists x[\text{DOOR}(x) \wedge \text{OPEN}(x,e^1{}_s) \wedge \underline{\neg\exists x[\text{DOOR}(x) \wedge \text{OPEN}(x,e^2{}_s)]}]$

In short, quantificational holder arguments help to tease apart different analyses of the semantics of *again* even within scope-based analyses of restitutive presuppositions. The different formulations have non-trivial empirical consequences, making different predictions in regards to how *again*'s presupposition can be satisfied and show that a semantics like Bale's (2007), which I have been assuming throughout this dissertation, makes the correct predictions.

3.5 The Syntax and Semantics of *Re-* Prefixation

Another morphological process that has been observed to lead to restitutive presuppositions in English is *re*-prefixation (e.g. Harley, 2004; Marantz, 2005, 2007, 2009). In this section, I discuss the sorts of restitutive presuppositions possible with *re-*, arguing that it differs from *again* in its syntactic attachment site as well as semantic type based on its interaction with quantificational arguments of change-of-state verb roots. I then argue against other accounts of *re*-prefixation, specifically that of Marantz (2007, 2009), who proposes that the state *re-* targets is in fact denoted by the DP object rather than the result verb root.

3.5.1 The Distribution of *Re-*

As has been noted in the literature, restitutive *re-* prefers attaching to unaccusative and accomplishment verbs over unergative and patient-taking transitive verbs (Horn, 1980; Marantz, 2005, 2007).

(3.58) a. I re-opened the door / re-painted the house / re-arranged the furniture.

b. The door re-opened / The ice cream re-melted.

c. The stain re-emerged / re-appeared.

d. ?? I re-smoked / re-laughed.

e. ?? I re-kicked the wall / re-reached the top of the mountain.

Marantz (2005, 2007) takes this to mean that *re-* refers not to repetition of the whole activity but rather the re-occurrence of a result state within the VP. That is, it always scopes low over a result state and any repetitive presupposition arises as a result of the repetitive presupposition asymmetrically entailing the restitutive presupposition, making *re-* compatible with a repetitive context (Dowty, 1979; Wechsler, 1989; Marantz, 2005, 2007; Beavers and Koontz-Garboden, 2020). Thus, *re-* does not occur with simple activity predicates while *again* does.

(3.59) a. John smiled again.

b. # John re-smiled.

In addition, Horn (1980) also notes that *re-* requires a direct object, either a transitive one or the underlying object of an unaccusative result predicate. Marantz (2007) points out further that not any transitive direct object will license the appearance of *re-*; rather, the direct object must be affected in some way, serving as the measure of the caused event.

(3.60) a. ?? John re-reached the top of the mountain.

b. ?? John re-left the room.

Finally, Keyser and Roeper (1992) note that in addition to the existence of a result state and the necessity of an object, restitutive *re-* shows other forms of restrictions on what it can attach to: it disallows attachment to verbs which allow

a benefactive object, verbs with particles, complex resultatives where manner and result are realized separately, and verbs with goal PPs.

(3.61) a. * refound an island (find her an island), *rebought a car (buy her a car)

b. *resold his friend out (sell his friend out), *reopened the door up (open the door up), *rewrote the idea down (write the idea down)

c. *redrive someone crazy, *remake someone sick, *rewipe something clean

d. *rejump over the fence, *rerun to the store

3.5.2 Quantificational Arguments and Change-of-State Roots with *Re-*

I argue here that the above generalizations about *re-* can be traced to *re-*'s semantic type as well as the syntactic constituent it can attach to. While it behaves similarly to *again* in that it produces a restitutive presupposition, it shows restrictions in what it can combine with because it is of type $<<e,<s,t>>,<e,<s,t>>>$, requiring as its first argument a function that takes an individual argument and returns a predicate of events (Lechner et al., 2015; Beavers and Koontz-Garboden, 2020). Syntactically, it requires attachment to an uncategorized root constituent that names a result state that must subsequently be categorized by a verbalizing head (Harley, 2004).

Evidence for such an analysis comes from the unavailability of quantificational restitutive presuppositions with *re-* (Lechner et al., 2015). As demonstrated in (3.7) and (3.12), verb roots that participate in the lexical causative-inchoative alternation allow quantificational and bound restitutive presuppositions with *again* in the lexical causative, but not in the inchoative. The crucial observation with *re-* is that unlike *again*, *re-* only ever allows a bound restitutive presupposition, whether in the lexical causative or the inchoative.

(3.62) a. CONTEXT: There are two doors, door A and door B. Door A was built open and door B built closed. The wind blows door A shut. Mary comes by and restores door A's open state so...
✓ Mary re-opened a door.

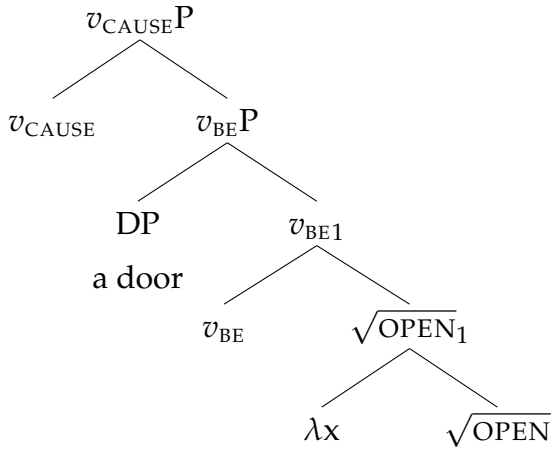
b. CONTEXT: There are two doors, door A and door B. Door A was built open and door B built closed. The wind blows door A shut. Mary comes by and opens door B so...
Mary re-opened a door.

(3.63) a. CONTEXT: There are two doors, door A and door B. Door A was built open and door B built closed. The wind blows door A shut. Another gust of wind blew through and door A opened so...
✓ A door re-opened.

b. CONTEXT: There are two doors, door A and door B. Door A was built open and door B built closed. The wind blows door A shut. Another gust of wind blew through and door B opened so...
A door re-opened.

Consider now how this might be captured in the present analysis. In the lexical causative, which has a structure as in (3.16) and repeated below, I captured the bound presupposition of *again* by assuming that it adjoins directly to the root which, prior to abstraction over its unbound variable, is of type $<s,t>$.

(3.64) Lexical Causative



Since *re-* favors an object that is interpreted as undergoing a change of state and only permits a bound restitutive presupposition, I propose that it attaches to the root *after* abstraction over the root's variable has taken place, namely at the node labeled $\sqrt{\text{OPEN}}_1$. This node is of type $<e,<s,t>>$. Assuming that *re-* has semantics identical to *again* except for its semantic type, the fact that it only attaches to a type $<e,<s,t>>$ constituent straightforwardly predicts it only ever allows a bound restitutive presupposition. As shown below, the semantic composition up to v_{BE}P ensures that the existential quantifier is contained only in the assertion and not the presupposition, ensuring only a bound presupposition is possible as observed in (3.62). The same sequence of steps will apply up to (3.65b) for the inchoative, since the inchoative shares this particular constituent with the lexical causative but lacks v_{BE}.

(3.65) a. $[\![\text{re-}]\!]$: $\lambda P_{<e,<s,t>>}.\lambda x.\lambda e[P(x)(e)]$
PRESUPPOSITION: $\exists e^1.\exists e^2[e^1 \prec e^2 \prec e \wedge P(x)(e^1) \wedge \neg P(x)(e^2)]$

b. $[\![\sqrt{\text{OPEN}}_1]\!]$: $\lambda x.\lambda e_s[\text{OPEN}(e_s) \wedge \text{HOLDER}(e_s) = x]$

c. $[\![\text{re-}\sqrt{\text{OPEN}}_1]\!]$: $\lambda x.\lambda e_s[\text{OPEN}(e_s) \wedge \text{HOLDER}(e_s) = x]$
PRESUPPOSITION: $\exists {e^1}_s.\exists {e^2}_s[{e^1}_s \prec {e^2}_s \prec e \wedge \text{OPEN}({e^1}_s) \wedge \text{HOLDER}({e^1}_s) = x \wedge \neg[\text{OPEN}({e^2}_s) \wedge \text{HOLDER}({e^2}_s) = x]]$

d. $[\![v_{\text{BE}}]\!]$: $\lambda P_{<e,st>}.\lambda x.\lambda e_s[P(x)(e_s)]$

e. $[\![v_{BE1}]\!]$: $\lambda x.\lambda e_s[\text{OPEN}(e_s) \wedge \text{HOLDER}(e_s) = x]$
PRESUPPOSITION: $\exists e^1{}_s.\exists e^2{}_s[e^1{}_s \prec e^2{}_s \prec e \wedge \text{OPEN}(e^1{}_s) \wedge \text{HOLDER}(e^1{}_s) = x \wedge \neg[\text{OPEN}(e^2{}_s) \wedge \text{HOLDER}(e^2{}_s) = x]]$

f. $[\![\text{a door}]\!]$: $\lambda P_{<e,st>}.\lambda e.\exists x[\text{DOOR}(x) \wedge P(x)(e)]$

g. $[\![v_{BE}P]\!]$: $\lambda e_s.\exists x[\text{DOOR}(x) \wedge \text{OPEN}(e_s) \wedge \text{HOLDER}(e_s) = x]$
PRESUPPOSITION: $\exists e^1{}_s.\exists e^2{}_s[e^1{}_s \prec e^2{}_s \prec e \wedge \text{OPEN}(e^1{}_s) \wedge \text{HOLDER}(e^1{}_s) = x \wedge \neg[\text{OPEN}(e^2{}_s) \wedge \text{HOLDER}(e^2{}_s) = x]]$

Note that if *re-* is of type <<*e*,<*s*,*t*>,<*e*,<*s*,*t*>>, there is in principle another attachment site in the lexical causative that would produce the observed restitutive presupposition, namely at v_{BE1} which is a constituent of type <*e*,<*s*,*t*>>. I will maintain, however, that *re-* attaches directly to the root whose variable has been abstracted over. One reason for this is that it maintains a uniform analysis for the inchoative, which lacks the v_{BE1} position, a crucial component of the explanation of why the inchoative disallows a quantificational restitutive presupposition. Another reason is that if *re-* must attach to a change-of-state verb root that names the result state, then we can straightforwardly explain why *re-* is not permitted with verbs with particles, complex resultatives, verbs with goal PPs, and verbs with optional indirect objects. It is simply the case that in these constructions, the result state is named either by the particle, a result root that does not need to be categorized by little v, a prepositional element, or that there is simply no result state root in which *re-* can attach to. This is consistent with Harley's (2004) interpretation of Keyser and Roeper's (1992) observations of *re-*prefixation as a constraint on conflation and the spelling-out of phonological features, where the condition on *re-* attachment is that the constituent *re-* attaches to must conflate with a categorizing little v.

Another constraint on *re-* to be accounted for involve Keyser and Roeper's (1992) original observation that *re-* is disallowed with double object constructions. This would seem to be mysterious, as modification by *again*, which has

similar semantics as *re-*, does indeed produce a restitutive presupposition. Here, I illustrate with Beck and Johnson's (2004) examples with *give*, a canonical ditransitive verb, and *sew*, which can take an optional indirect object.

(3.66) a. Thilo gave Satoshi the map again.

1. Thilo gave Satoshi the map and that had happened before. (*Repetitive*)
2. Thilo gave Satoshi the map and Satoshi had the map before. (*Restitutive*)

b. * Thilo re-gave Satoshi the map.

c. Thilo sewed Satoshi a flag again.

1. Thilo sewed Satoshi a flag and that had happened before. (*Repetitive*)
2. Thilo sewed Satoshi a flag and Satoshi had a flag before. (*Restitutive*)

d. * Thilo re-sewed Satoshi a flag.

Beck and Johnson (2004) take the possbility of a restitutive presupposition with *again* as evidence for the fact that English double-object constructions (both obligatory and optional) as containing a stative constituent denoting possession as shown below for (3.66a).

(3.67) λe.HAVE(*the map, Satoshi*)(e)

It now remains to be explained why *re-* cannot attach to double object constructions to produce a restitutive presupposition. Again, I follow Harley (2004) here and argue that restitutive *re-* must directly attach to an acategorial root of type $<e,<s,t>>$ and that this root must be categorized by a little v head.[22] Sup-

[22]In Marantz (2005), this is interpreted as a constraint that the constituent *re-* attaches to must not be a branching phrase i.e., syntactic small clause or otherwise.

pose that the constituent in (3.67) is formed via a syntactic head such as P_{HAVE} (Harley, 2003) with the following semantics (adapted from Beavers and Koontz-Garboden, 2017).

(3.68) $[\![P_{HAVE}]\!]$: $\lambda x.\lambda y.\lambda e_s[\text{HAVE}(x,y)(e_s)]$

Given this semantics for P_{HAVE}, *re-* can only attach to the stative possession constituent after P_{HAVE} has taken its first entity argument. As Harley (2004) suggests, the conflation of *re-*'s complement must be complete in that the entire constituent must conflate with a categorizing little *v*. Thus, for *re-* attachment, both P_{HAVE} and its first entity argument must undergo head movement to a v_{CAUSE} to produce the surface form *give* (Harley, 2003). However, this produces the ungrammatical form **give the map Satoshi*; since this is ungrammatical, this indicates that in English only P_{HAVE} moves to v_{CAUSE} excluding both of its entity arguments, producing the grammatical surface double object form *give Satoshi the map*. Given the condition on *re-* attachment where the entire constituent it attaches to must be categorized by a little *v*, we now have an explanation of why *re-* is not allowed with double object constructions, since only P_{HAVE} conflates with *v* and hence stranding its first argument (Harley, 2004).

3.5.3 On DPs as States: Marantz (2005, 2007)

In series of works, Marantz (2005, 2009) advances a different view of internal arguments, arguing that no internal arguments are ever licensed by the verbal root. In addition, he seeks to eliminate the proliferation of unpronounced elements, suggesting that unpronounced heads must be motivated on theoretical or paradigmatic grounds. For example, a little *v* head is sometimes pronounced *-ize* or *-en* in English, and an applicative head is also pronounced in languages like Bantu, motivating their existence in the syntactic structure (Marantz, 2005). In his view, there should be no CAUSE, BECOME, or BE heads in the syntax; these mean-

ings arise constructionally based on the syntactic relations between a general activity little *v* introducing an event and what is contained in little *v*'s complement.

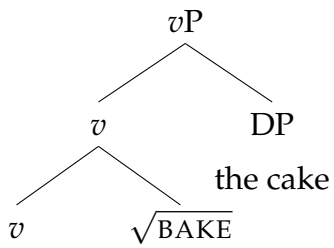
Marantz (2005) begins with the observation that *re-* favors unaccusatives and accomplishment verbs, targeting the change-of-state in these verb roots and presupposes that an identical change-of-state occurred before, as described in (3.58). However, he observes that *re-* also attaches to verbs of creation (explicit creation verbs in Levinson, 2014) like *bake* and *build*, where the DP object names the entity that is created.

(3.69) a. I re-baked the cake.

b. I re-built the classic 1920s house in 21st century Los Angeles.

Given that Marantz (2005, 2007) assumes *re-* (preferentially) targets a change-of-state event, the question of what *re-* is targeting in verbs of creation arises. This is especially so given the structure he assigns to explicit creation verbs, where the verb root is adjoined to the little *v* and the object serves as the complement of *v*. Using *bake* as an example, in such a structure, there is no obvious syntactic constituent that names a state that *re-* attaches to.

(3.70)



Marantz's (2005; 2007) answer to this question is that *re-* is really modifying the object DP, which has been coerced via a semantic rule that turns the syntactic DP into a constituent that denotes a state. The following semantic rule illustrates this coercion process (Wood, 2012; Wood and Marantz, 2017), and the DP *the cake* is interpreted as follows.

(3.71) $[\![\text{DP}]\!] \rightarrow \text{STATE}([\![\text{DP}]\!]) = \lambda x.\lambda s.\text{STATE}(s,x)([\![\text{DP}]\!])$

(3.72) $[\![\text{the cake}]\!] \rightarrow \text{STATE}([\![\text{the cake}]\!]) = \lambda x.\lambda s.\text{STATE}(s,x)([\![\text{the cake}]\!])$
$= \lambda s.\text{STATE}(s,\iota x.\text{CAKE}(x))$

Explicit creation verbs like *bake* then are essentially interpreted on a par with lexical causatives; in the presence of an external argument introduced by VOICE, little v in the structure above is interpreted as introducing causative semantics as in Kratzer's (2005) CAUSE. In structures with no external argument, v is interpreted as BECOME as in Dowty (1976). What *re-* targets then is this semantically stative constituent and presupposes that the state that holds of the object of *bake* also held previously. Such a state would then presumably be that of existence, with the change being from non-existence to existence (Marantz, 2005).

Marantz (2007) suggests that this process of DP coercion is general and occurs across verb types.[23] In effect, there are no 'plain vanilla' direct objects; all canon-

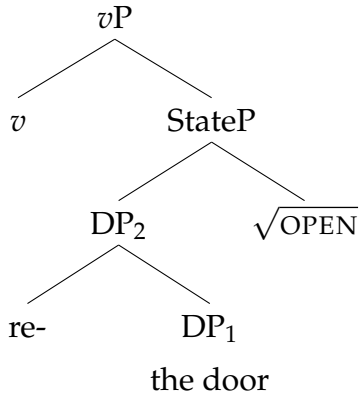
[23]I do not provide an analysis of Marantz's (2007; 2009) observations with creation and incremental theme verbs like *bake*, which Levin and Rappaport-Hovav (1992) note can be ambiguous between a creation and change-of-state reading. However, even in the change-of-state reading of *bake*, it is unclear that *again* or *re-* is producing a restitutive presupposition even with low attachment, as assumed by Marantz (2007, 2009). Recall that restitutive presuppositions require reversal of a result state (Fabricius-Hansen, 2001); however, this does not seem to be the kind of presupposition produced with *again* or *re-* when the internal argument is definite. Rather, what is required is that the internal argument does not reach the state of *being cooked*, and that the baking event in the assertion seeks to rectify this, as illustrated in the context below (Ryan Walter Smith, personal communication). Crucially, there is no reversal of the state of being cooked such that the cake was cooked, then became not cooked, before once more becoming cooked.

(i) CONTEXT: John baked a cake previously but because he got the temperature of the oven wrong, the cake was not cooked through. He left it on the table for Mary thinking that she will enjoy it. Mary, while cutting the cake with a knife, discovers that the inside of the cake is uncooked and decides to put it back in the oven to keep baking till cooked so...
✓ Mary baked the cake again. / ✓ Mary re-baked the cake.

This suggests that *bake*'s change-of-state reading should be analyzed more like a comparative,

ical direct objects undergo a change-of-state and are the subjects of secondary predication (Marantz, 2007). A verb root that exhibits the lexical causative-inchoative alternation and names the result state like *open* will have the structure as below, adjoining as a DP modifier naming the state in the DP's semantics after the coercion rule has applied. Here, *re-* attaches directly to the DP but presupposes a state that the DP denotes (Marantz, 2007). I provide the semantic composition up to the point where the root $\sqrt{\text{OPEN}}$ is introduced and excluding CAUSE, since this will be the only relevant portion for the discussion to follow.[24]

(3.73)



(3.74) a. $[\![\text{re-}]\!]$: $\lambda P_{<s,t>}.\lambda e[P(e)]$
PRESUPPOSITION: $\exists e^1.\exists e^2[e^1 \prec e^2 \prec e \wedge P(e^1) \wedge \neg P(e^2)]$

b. $[\![DP_1]\!] \rightarrow \text{STATE}([\![\text{the door}]\!]) = \lambda x.\lambda e_s.\text{STATE}(e_s,x)([\![\text{the door}]\!])$
$= \lambda e_s.\text{STATE}(e_s,\iota x.\text{DOOR}(x))$

---

where the internal argument becomes *more baked than at the start of the event*, akin to comparative analyses of degree achievements to be discussed in the next section (Heidi Harley, personal communication). I will leave exploration of the precise interactions of *again* and *re-* with creation verbs like *bake* and the exact analysis required for future work.

[24]Note that neither Marantz (2007) nor later work in Wood and Marantz (2017) give explicit semantic compositions for these structures involving verb roots like *open*. The semantics I provide here are based on my understanding of how the structure should compose semantically. In Marantz's (2007) analysis, the verb root $\sqrt{\text{OPEN}}$ and *re-* will necessarily need to be of type $<s,t>$ and $<<s,t>,<s,t>>$ respectively in order for the proposed structure to compose. Thus, his analysis of *re-* would differ from what I proposed previously.

c. $[\![\text{DP}_2]\!]$: $\lambda e_s.\textsc{state}(e_s,\iota x.\textsc{door}(x))$
PRESUPPOSITION: $\exists e^1{}_s.\exists e^2{}_s[e^1{}_s \prec e^2{}_s \prec e \wedge \textsc{state}(e^1{}_s,\iota x.\textsc{door}(x)) \wedge \neg[\textsc{state}(e^2{}_s,\iota x.\textsc{door}(x))]]$

d. $[\![\sqrt{\text{OPEN}}]\!]$: $\lambda e_s.\textsc{open}(e_s)$

e. $[\![\text{StateP}]\!]$: $\lambda e_s[\textsc{state}(e_s,\iota x.\textsc{door}(x)) \wedge \textsc{open}(e_s)]$
PRESUPPOSITION: $\exists e^1{}_s.\exists e^2{}_s[e^1{}_s \prec e^2{}_s \prec e \wedge \textsc{state}(e^1{}_s,\iota x.\textsc{door}(x)) \wedge \neg[\textsc{state}(e^2{}_s,\iota x.\textsc{door}(x))]]$

While I will not comment on the general merits of Marantz's (2005; 2007) and Wood and Marantz's (2017) overall program of direct objects never being selected by roots themselves and eliminating little *v* heads from the syntax, there are nonetheless some problems with their specific implementation for change-of-state verb roots and interpreting DPs as states to account for the *re*-prefixation observations. First, note that Marantz (2005, 2007) proposes that *re-* is really attaching to the DP denoting a state rather than the change-of-state verb root. This is morphologically counter-intuitive, as on the surface *re-* is clearly prefixed to the verb root itself. It may not be difficult to propose some morphological adjustment rule that applies post-syntactically, ensuring that *re-* surfaces on the verb root rather than the DP that it modifies. It is difficult, however, to see what would motivate such a rule. To the extent such a rule is justified, we should expect to see other cases where a rule like that would apply, dislocating a prefix attached to a DP syntactically to instead appear on the surface verb. In the absence of such evidence, such a readjustment rule to obtain the surface form would be ad hoc, stipulative, and undesirable.

Beyond theoretical parsimony and the stipulative nature of postulating a rule to obtain the surface morphological form, there are genuine empirical problems with the analysis of *re*-prefixation as attaching to the DP interpreted as a state. First, notice once again that Marantz (2005; 2007) utilizes a definite DP as the direct object in question as it would be of semantic type *e* and would not show

any scopal interactions with presuppositional modifiers like *re-* and *again*. Recall that while *again* exhibits an ambiguity for restitutive presuppositions with quantificational objects in the lexical causative but not the inchoative variant of change-of-state verb roots in (3.7) and (3.12), *re-* lacks such an ambiguity and only permits a bound restitutive presupposition in either variant in (3.62) and (3.63). Consider now the analysis in (3.73) and (3.74), but with a quantificational argument like an indefinite DP. Marantz's (2007) analysis would involve coercing the indefinite DP into a state via the rule in (3.71). This means that the existential quantifier associated with the indefinite DP will be contained within the predicate of states that the coercion rule produces and ultimately fall within the scope of *re-*'s presupposition.

(3.75) a. $[\![\text{a door}]\!] \rightarrow \textsc{state}([\![\text{a door}]\!]) = \lambda x.\lambda e_s.\textsc{state}(e_s,x)([\![\text{a door}]\!])$
$= \lambda x.\lambda e_s.\textsc{state}(e_s,x)(\lambda P_{<e,st>}.\lambda e.\exists x[\textsc{door}(x) \wedge P(x)(e)])$
$= \lambda e_s.\exists x[\textsc{door}(x) \wedge \textsc{state}(e_s,x)]$

b. $[\![\text{re- a door}]\!]$: $\lambda e_s.\exists x[\textsc{door}(x) \wedge \textsc{state}(e_s,x)]$
PRESUPPOSITION: $\exists e^1.\exists e^2[e^1 \prec e^2 \prec e \wedge \exists x[\textsc{door}(x) \wedge \textsc{state}({e^1}_s,x)]$
$\wedge \neg\exists x[\textsc{door}(x) \wedge \textsc{state}({e^2}_s,x)]]$

Since the existential quantifier is contained with the presupposition, the analysis predicts that *re-*prefixation should be able produce a quantificational restitutive presupposition under the DP coercion rule. This should apply across both the causative and inchoative, since the structure in (3.73) is the shared core of lexical causatives and inchoatives and the only difference lies in how little v is interpreted. This prediction is plainly the reverse of what is actually observed empirically as demonstrated in (3.62) and (3.63), where only a bound restitutive presupposition is permitted. Similarly, the analysis predicts that *again* should produce the same restitutive ambiguity in the inchoative, since the DP will be a type $<s,t>$ constituent *again* can attach to. Again, this delivers the wrong pre-

diction since *again* only ever produces a bound restitutive presupposition with inchoatives as shown in (3.12). Granting that the DP coercion rule in (3.71) is correct, the structure proposed in (3.73) delivers the wrong predictions for both *re*-prefixation and *again*-modification and thus should be ruled out.

In fact, it is not difficult to see that the DP coercion rule in (3.71) also predicts presuppositions that are not attested. Notice that the result of the DP coercion rule simply asserts that an unspecified state holds of the DP direct object. This state is then named by the change-of-state verb root via PREDICATE MODIFICATION as shown in (3.74). Marantz (2005, 2007) proposes that *re-* attaches to this DP prior to the attachment of the change-of-state verb root naming the state. As a result, the state named by the verb root does not fall within *re-*'s presupposition and only the unspecified state does. This is shown in (3.75b). What this means then is that in the presupposed prior state that holds of the DP object, *any state* in principle could have held of the direct object, since the state is unnamed and it should be acceptable to assert that a particular state named by the verb root in the assertion is restored or holds again of the DP object. The same presupposition is predicted for *again*-modification, which can attach to the DP just like *re-*. This is plainly incorrect and it is never acceptable to use *re-* and *again* in these contexts. The following context, where the temporally prior state is *broken*, the asserted state is *open*, and the DP object is a definite DP *the door*, illustrates. Here, it is inconsequential that the DP is definite since I am testing for the possibility of the state being different across the presupposition and assertion and not scopal interactions between a quantificational argument and presuppositional content.

(3.76) CONTEXT: The door in the room was broken because of wear and tear and nobody broke it. Mary came into the room and fixed the door. John later came into the room and...
John re-opened the door. / # John opened the door again.

Clearly, if a DP coercion rule exists, it cannot simply coerce the DP direct ob-

ject into an unspecified state that holds of it. Rather, it must always include the change-of-state verb root and both *re-* and *again* must scope over the verb root, explaining why the context in (3.76) is unacceptable.

Instead, the analysis proposed here in (3.64) and (3.65) captures both facts. Because of *re-*'s semantic type of $<<e,<s,t>>,<e,<s,t>>>$, any quantifier contained within the direct object must always scope above it as a matter of semantic composition and semantic type compatibility. Furthermore, I assume that *re-* attaches directly to the root that names the state, differing from *again* in that it attaches after and not before abstraction over the change-of-state verb root's unbound variable takes place. This ensures that the presupposed prior state must always be the same as the one the verb root names. Again, while Marantz's (2005; 2007) overall enterprise might have its merits, the specific analysis of *re-*prefixation faces empirical challenges to which I do not see easy solutions.

3.6 Degree Achievements

Before closing the chapter, I discuss degree achievements (DAs), which I take to be deadjectival verbs formed from roots that denote properties on open scales like *widen*, *narrow*, *shorten*, *broaden*, *grow*, *rise*, *fall* etc., and their interactions with *again*'s restitutive presupposition (Pedersen, 2015). This is in contrast to change-of-state verb roots that denote properties on closed scales and their behavior with *again* as I have been discussing so far in this chapter.[25] I review modern scalar analyses of DAs that involve a degree-based semantics and hence require a scalar analysis of *again*'s restitutive presupposition, and provide some empirical arguments against them. I propose for a return to structutral ambiguity accounts to account for the difference between closed and open scale deadjectival verbs, and

[25]I take the term *deadjectival verbs* to encompass both change-of-state verbs and DAs in the following discussion.

give a preliminary compositional sketch of how such an analysis might be implemented.

3.6.1 Scalar Analyses of Degree Achievements: Kennedy and Levin (2008) and Pedersen (2015)

The main observation is that in sentences containing DAs modified by *again*, the repetitive presupposition and non-repetitive (restitutive/counter-directional) presupposition in fact do not entail each other, as in the cases with change-of-state verbs discussed so far in this chapter. Furthermore, with DAs, *again*'s repetitive presupposition can be satisfied by a 'successive increase' context, where there need not be a reversal of the property described by the DA in an intermediate temporal interval between the presupposed and asserted event. I illustrate with Pedersen's (2010; 2015) examples with *widen*.

(3.77) a. The river widened two months ago, and this month it widened again. (*successive increase, no reversal*)

b. The river narrowed last month, but this month widened again. (*reversal/counter-directional*)

The generalization here is that this behavior with *again*-modification is observed only with deadjectival verbs that are derived from relative (e.g. *wide*) rather than absolute adjectives (e.g. *dry*) i.e., adjectives denoting properties on open rather than closed scales. This correlates with another property typically observed with relative adjectives: they do not generate positive form inferences as compared to absolute adjectives. Only deadjectival verbs derived from relative adjectives that do not show positive form inferences have the kinds of presuppositions observed in (3.77). This is further illustrated with differences in how the two classes interact with *again*; with DAs formed from open scale relative adjectives like *wide*, a simple counter-directional context licenses the use of *again*,

whereas a previous decrease in dryness for *dry* does not and requires a context where the object was completely dry (Pedersen, 2015, examples from Spathas, 2019).

(3.78) a. The clothes dried. ⇒ The became dry.
b. The river widened. ⇏ The river became wide.

(3.79) a. # The wet clothes got even more wet, but then they dried again.
b. The wide gap narrowed, then widened again.

These observed differences led to the postulation of different structures within decompositional accounts like von Stechow's (1996). In these accounts, deadjectival verbs formed from closed scale adjectives involve POS(ITIVE) while those formed from open scale adjectives (DAs) involve COMP(PARATIVE), which are then verbalized by verbal functional heads like v_{BECOME} (von Stechow, 1996; Spathas, 2019).[26] Under an analysis of *again* as an event modifier, the observation in (3.79) falls out because *again*'s presupposition is filled in with the semantics of the constituent embedded under v_{BECOME}. Informally, the restitutive presupposition produced by *again* for *dry* is paraphrasable as *at some earlier time the clothes were dry*, while for *wide* the presupposition produced would be *at some earlier time the width of the gap was narrower than at the beginning of the widening* (Spathas, 2019).

(3.80) [v_{BECOME} [POS dry]]

(3.81) [v_{BECOME} [COMP wide]]

Pedersen (2015) argues, however, that proposing that deadjectival verbs have different decompositional structures to capture the observations with *again* is ad hoc and misses an important generalization. First, it is not clear why only those

[26] POS is an operator that produces the positive value of an adjective by introducing a contextually determined standard on the scalar property denoted by the adjective, while COMP introduces an overt standard of comparison (Kennedy, 2007; Kennedy and Levin, 2008).

verbs formed with relative adjectives require COMP and can never have POS and vice versa. Second, the generalization being missed is that the inferential properties of deadjectival verbs are predictable based on the corresponding lexical semantics, specifically the scalar structure, of the gradable adjective from which they are derived (Kennedy and Levin, 2008; Pedersen, 2015).[27] In order to capture the observation that the inferential properties of deadjectival verbs are dependent on the scalar structure of the corresponding adjectives, authors like Kennedy and Levin (2008) and Pedersen (2015) propose unified scalar accounts of how they are derived. The intuition of the analysis is that deadjectival verbs are built out of the same core as their underlying adjectives; that is, they are underlyingly *measure functions* that take an individual argument and return a measure of the scalar property that the object holds (Kennedy, 2007) i.e., a degree. In terms of semantic type, adjectives are thus of type $<e,d>$, where d represents the semantic type of degrees. Both closed and open scale roots hence have the identical semantic types and denotations, which I illustrate with *dry* and *wide*.[28]

(3.82) a. $[\![\text{dry}_{Adj}]\!]$: λx.DRY(x)

b. $[\![\text{wide}_{Adj}]\!]$: λx.WIDTH(x)

Note that the measure functions do not return properties of individuals and events; this is the function of degree morphemes like POS(ITIVE) or COMP(PARATIVE), by introducing either contextually determined standards or overt standards of comparison. In the adjectival domain, these would produce

[27]Kennedy and Levin (2008) show that the variable telicity of deadjectival verbs also falls out directly from the scalar structure of their corresponding gradable adjectives in a scalar analysis. I discuss here the kinds of presuppositions produced with *again* rather than telicity; the reader is invited to consult Kennedy and Levin (2008) for details of how variable telicity is captured in a scalar account.

[28]Kennedy and Levin (2008) and Pedersen (2015) relativize measure functions to times, since they return the degree of the property that the object holds at a momentary point in time. I will omit the temporal variable here for perspicuity.

properties of individuals holding a particular degree of the scalar properties denoted by the adjectives, and that this degree exceeds some contextually determined degree or a standard of comparison. Concentrating on the verbal domain with deadjectival verbs, the intuition is that the measure functions denoted by the underlying adjectives are converted into *measures of change from participating in an event*. There are at least two ways of implementing this: Kennedy and Levin (2008) propose *measure of change functions* (MOCs) built from the underlying measure and difference functions, while Pedersen (2015) suggests that the underlying measure functions are converted into *degree vectors*, which are ordered pairs of degrees from a single scale. I give their formal representations below, drawing on Spathas's (2019) formalization of the degree vector approach which relativizes it to events rather than times as does Pedersen (2015) to be consistent with the event-based approach taken in the chapter.[29]

(3.83) a. Difference function:
For any measure function m from objects to degrees on a scale S, and for any $s \in S$, $m_d^{\uparrow}$ is a function just like m except that:
i. its range is $\{d' \in S \mid d \preceq d'\}$
ii. for any x in the domain of m, if $m(x) \preceq d$, then $m_d^{\uparrow}(x) = d$.

b. Measure of change function:
For any measure function m, $m_{\Delta} = \lambda x.\lambda e.m^{\uparrow}{}_{m(x)(\text{INIT}(e))}(x)(\text{FIN}(e))$
(Kennedy and Levin, 2008)

(3.84) $[\![\text{wide-en}]\!]$: $\lambda x.\lambda e.<\text{WIDTH}(x)(\text{INIT}(e)), \text{WIDTH}(x)(\text{FIN}(e))>$
(Spathas, 2019)

[29] I will also assume that various operators, such as the *-en* suffix (Pedersen, 2015) or dedicated *v* heads (Spathas, 2019) convert measure functions into measure of change functions. Kennedy and Levin (2008) do not make explicit if any functional heads or morphology serve to perform this task.

Similar to measure functions, these measure of change functions take an individual argument, then an event argument, and return a degree (or a pair of degrees) representing a measure of change. In other words, they are still not functions that return truth values. To produce a truth-evaluable statement, scalar analyses in general postulate a verbal version of POS, which introduce a *standard of change* (SOC) and checks that the degree returned by the measure of change function or pair of degrees exceeds the standard or is within the set of degree vectors contained within the standard of change set.

(3.85) $[\![\text{POS}_v\ \text{m}_\Delta]\!]$: $\lambda x.\lambda e.\text{m}_\Delta(x)(e) \succeq \text{STND}(\text{m}_\Delta)$ (Kennedy and Levin, 2008)

(3.86) $[\![\text{POS}_v$ wide-en$]\!]$: $\lambda x.\lambda e.<\text{WIDTH}(x)(\text{INIT}(e)),\ \text{WIDTH}(x)(\text{FIN}(e))> \in \text{SOC}_{wide}$ (Spathas, 2019)

It is at this step, where verbal POS_v is introduced, that the difference between closed scale and open scale adjectives emerges. For Kennedy and Levin (2008), MOCs always denote scales with lower bounds/minimum degrees by definition, which is the degree to which the object manifests a property at the beginning of the event as shown in (3.83b). If the underlying adjective has an upper bound/maximum degree, this will be inherited by the MOC. The STND function introduced by POS_v selects the standard degree for comparison. If the standard is set as the minimum degree inherent in MOCs, then any positive change in the measure of a property will satisfy the condition imposed by POS_v. On the other hand, if the standard is set as the maximum degree for a upper closed adjective, then only a complete change of state will satisfy POS_v (i.e., going from *wet* to *dry*). For degree vector approaches, the standard of comparison is a set of degree vectors: upper closed adjectives have as the second member of that set of degree vectors the maximum degree of the relevant scale, lower closed ones have as the first member of the set of vectors the minimum degree, and open scale adjectives have as the second member a degree higher than the degree held by the object at

the beginning of the event (Pedersen, 2015). Crucially, these choices are regulated by Kennedy's (2007) INTERPRETIVE ECONOMY, which always selects a maximum or minimum degree if the underlying adjective contains one, rather than a contextually determined degree.

(3.87) INTERPRETIVE ECONOMY: Maximize the contribution of the conventional meaning of the elements of a sentence to the computation of its truth conditions.

(3.88) a. SOC set for verbs with a maximal degree (e.g. *dry*):
$\{<d, \text{MAX}_{\text{DRY}}>: d <_{\text{DRY}} \text{MAX}_{\text{DRY}}\}$

b. SOC set for verbs with a minimum degree (e.g. *blur*):
$\{<\text{MIN}_{\text{BLUR}}, d>: \text{MIN}_{\text{BLUR}} <_{\text{DRY}} d\}$

c. SOC set for verbs without a maximum or minimum degree (e.g. *widen*):
$\{<d,e>: d <_{\text{WIDE}} e\}$

(Pedersen, 2015, pp. 395)

At this point, we may begin to wonder how these tie into the analysis of *again*'s restitutive (change-of-state verbs) or counterdirectional (DAs) presupposition. Notice that under both the MOC and degree vectors approach, there is no stative constituent of the right semantic type for *again* to attach; there is only an overall *eventive* constituent, whose sub-constituents are functions from individuals to events to degrees of various sorts i.e., MOCs or degree vectors. It is only after POS_v is introduced that functions from individuals to predicates of events are produced, which *again* can then modify. Kennedy and Levin (2008) do not consider *again*-ambiguities, but Pedersen (2015) argues that one of the advantages of a degree vector approach is that it allows for a simple characterization of restitutive/counterdirectional *again*, which will be given a different lexical entry from repetititve *again*. Counterdirectional *again* will modify a constituent denoting a

degree vector, introducing a presupposition that the degree vector is *reversed* at some prior time by defining a NEG operator.[30] The examples below from (Pedersen, 2015, pp. 403-405) illustrate, using upper closed, lower closed, and open scale verbs for maximum clarity; recall that INTERPRETIVE ECONOMY will set one of the members of the degree vector to the minimum or maximum degree on the scale of a property denoted by the underlying adjective if it has one.[31] [32]

(3.89) Reversal presuppositions

a. The roof dried again. (*maximum degree*)
PRESUPPOSITION: $\exists i_1[i_1 \prec i \wedge \text{NEG}(\text{-EN}(\text{DRY}))(\textit{roof},i)]$
'There exists an interval i_1 prior to topic interval i where the roof went from a maximal degree of dryness to a non-maximal degree of dryness i.e., the roof previously got wet.'

b. The image blurred again. (*minimum degree*)
PRESUPPOSITION: $\exists i_1[i_1 \prec i \wedge \text{NEG}(\text{-EN}(\text{BLUR}))(\textit{image},i)]$
'There exists an interval i_1 prior to topic interval i where the image went from a non-minimal degree of blurriness to a minimum degree of blurriness i.e., the image previously got crisp.'

c. The river widened again. (*open scale*)
PRESUPPOSITION: $\exists i_1[i_1 \prec i \wedge \text{NEG}(\text{-EN}(\text{WIDE}))(\textit{river},i)]$
'There exists an interval i_1 prior to topic interval i where the river

[30] I will omit the formal details of NEG here for perspicuity and give a paraphrase of the relevant presuppositions produced.

[31] The variable i in the following examples range over temporal intervals in Pedersen's (2015) interval-based semantics.

[32] Note that the selecting of a maximum or minimum standard by POS_v if there is one will also account for why open scale adjectives permit the successive increase presupposition of *again* but closed scale adjectives do not; repetitive *again* will attach only after POS_v has been introduced and will therefore be sensitive to these choices. I do not discuss these in detail here but see Pedersen (2015, pp. 400-402) for details.

decreased on the scale of width i.e., the river previously narrowed.'

A scalar analysis based on degree vectors hence has two advantages. First, it does not need to postulate that deadjectival verbs built on closed scale adjectives have different decompositional structures from those built on open scale adjectives, as proposed by von Stechow (1996). As shown in the examples above, they receive a uniform semantics and syntax i.e., they are unified as a class, with their differences being derived from elsewhere. Second, it draws a strong connection between the scalar structure of the underlying adjectives and their verbal forms via appealing to global interpretive constraints like INTERPRETIVE ECONOMY, which selects either minimum or maximum degrees of scalar properties if they exist, leading to observed differences in *again*-ambiguities (and also variable telicity discussed in Kennedy and Levin, 2008). In contrast, decompositional approaches like von Stechow's (1996) have to appeal to an ambiguity between selecting for POS or COMP for particular classes, which seems ad hoc and stipulative.[33] Scalar analyses utlizing degree vectors achieve these results by giving up a uniform semantics of *again*-ambiguities, needing lexically polysemous *again* where one is an event-based modifier and the other, a degree vector modifier.

3.6.2 Issues with Degree-based Analyses

While scalar analyses that assume gradable adjectives have degree-based semantics in the form of measure functions have become widely accepted, they are not without their issues. Here, I outline some conceptual and empirical problems with these analyses, beginning with the MOCs of Kennedy and Levin (2008). Recall that for Kennedy and Levin (2008), deadjectival verbs involve MOCs, which are built out of measure functions. Specifically, MOCs denote difference functions relativzed to events. I reproduce the formal definitions below.

[33]I provide arguments in the next section that this is indeed the analysis that is needed to account for a wider range of sub-lexical modifiers.

(3.90) a. Difference function:
For any measure function m from objects to degrees on a scale S, and for any $s \in S$, $m_d^{\uparrow}$ is a function just like m except that:
i. its range is $\{d' \in S \mid d \preceq d'\}$
ii. for any x in the domain of m, if $m(x) \preceq d$, then $m_d^{\uparrow}(x) = d$.

b. Measure of change function:
For any measure function m, $m_{\Delta} = \lambda x.\lambda e.m^{\uparrow}{}_{m(x)(\text{INIT}(e))}(x)(\text{FIN}(e))$
(Kennedy and Levin, 2008)

There is, however, a problem with the specific implementation of difference functions, as noted by Baron (2018). The crux of the issue is that a difference function returns a degree *on the same scale as that of the measure function*, which is a scale of degrees of which an object holds a property. The effect of the differential degree *d* is to serve as a lower bound, creating a sub-scale of the original scale denoted by the adjective (see also Beavers, 2011 on sub-scales). In effect, a difference function *returns the measure of the degree of a property that the object holds, rather than a measure of difference between two degrees*.

This is carried over to the verbal domain, where the degree held by the object at the beginning of an event serves as the lower bound. The difference function takes an object and an event as arguments and returns the degree of the property held by the object at the end of the event on a sub-scale of the scalar property denoted by the measure function. As Baron (2018) emphasizes, the degree returned by a difference function is *not a degree of change*, but simply the degree of a property held by the object at the end of the event; that is, MOCs in fact *do not measure change*. The following contexts show that this definition of an MOC makes wrong predictions with measure phrases that explicitly indicate the extent of the change, producing truth conditions that do not capture the actual semantics of a DA like *widen* (Baron, 2018, examples (17) and (18)). In (3.91), the end

state of gap A measures 9 inches, which is wider than the 8 inches indicated by the measure phrase and hence the sentence in (3.91a) is predicted to be judged true under the truth conditions in (3.91b). However, the truth conditions of the sentence should be that the gap *increased by 8 inches*, rather than being wider than 8 inches, and (3.91a) is predicted to be *judged true under an MOC analysis for the wrong reason*, even if the change does measure 8 inches in the context. This is shown further by (3.92); here, the change measures only 2 inches and hence the sentence in (3.92a) is judged to be false. However, the truth conditions in (3.92b) would wrongly predict that (3.92a) should be judged true, since the measure of gap B at the end of the widening event in the context is 15 inches and hence wider than 8 inches.

(3.91) CONTEXT: There is a gap between two boats, Gap A. Waves rock the boats, and they are separated. Gap A goes from being 1 inch to being 9 inches.

a. Gap A widened 8 inches.

b. λe.WIDE$^{\uparrow}_{\text{WIDE}(GapA)(\text{INIT}(e))}$(*Gap A*)(FIN(e)) $\succeq$ 8 inches

(3.92) CONTEXT: Gap B, also widened by the waves that rocked Gap A, originally measured 13 inches but now measures 15 inches.

a. # Gap B widened 8 inches.

b. λe.WIDE$^{\uparrow}_{\text{WIDE}(GapB)(\text{INIT}(e))}$(*Gap B*)(FIN(e)) $\succeq$ 8 inches

The problem with the formal implementation of MOCs is compounded further when we consider verbal POS$_v$. The semantics of POS$_v$ combined with an MOC is reproduced below.

(3.93) $[\![\text{POS}_v\ \text{m}_\Delta]\!]$: λx.λe.m$_\Delta$(x)(e) $\succeq$ STND(m$_\Delta$) (Kennedy and Levin, 2008)

As noted above, the left side of the formula does not actually measure change. Baron (2018) notes that even if we were to grant that MOCs do measure change,

however it is to be implemented, issues arise with the right hand side containing the STND function introduced by POS. Here, STND needs to return a *maximum degree of change* that the left side of the formula needs to reach or exceed in order for the formula to be judged true; it is unclear, however, that there is a maximum degree of change in a property in order for the entire formula to be judged true. INTERPRETIVE ECONOMY does not alleviate matters here either. Suppose now that INTERPRETIVE ECONOMY ensures that for an MOC built out of a measure function with a maximum degree, the right side of the formula will return the maximum degree on the scale of the measure function. If so, as Baron (2018) argues, the left side of the formula which should measure *change* will have to exceed a maximum degree on a property scale. In other words, the two degrees on either side of the formula will be from *incommensurate scales* i.e., the formula will say that the *degree of change* is equal to or exceeds the *maximum degree of holding a property* rather than some degree of change, which is of course, not the desired truth conditions. In other words, the semantics of Kennedy and Levin (2008) does not allow access to both the original scale of the measure function and a scale of change of the property denoted by the measure function, which seem to be necessary in light of different kinds of measure phrases as shown below (Baron, 2018, pp. 7).

(3.94) a. Gap A widened by 8 inches. (*measure of change*)

b. Gap A widened to 9 inches. (*measure of end state*)

The intuition here is that the semantics needs to allow access to both the degrees held at the start and end states such that they can be independently specified by measure phrases, but also allow for a degree of change to be calculated by taking the difference between these two degrees. Pedersen (2015) notes that these are the exact advantages a degree vectors approach provides. Since degree vectors specify an ordered pair of degrees representing the degree held at the start

and end of the change event, it is much richer than MOCs and a *standard of change* can be specified via INTERPRETIVE ECONOMY, which sets either the starting or ending degree to a maximum or minimum if there is one. Standards of change are sets of degree vectors where one member of the degree vector is set as the minimum or maximum degree of the scale denoted by the underlying measure function if there is one, and if there is none, the second degree simply needs to be greater than the first. A sentence containing a DA is then judged true if the degree vector it denotes is a member of this standard of change set, avoiding the problems with an MOC analysis as noted by Baron (2018). This was discussed previously and I reproduce the examples of standard of change sets below.[34]

(3.95) a. SOC set for verbs with a maximal degree (e.g. *dry*):
$\{<d, MAX_{DRY}>: d <_{DRY} MAX_{DRY}\}$

b. SOC set for verbs with a minimum degree (e.g. *blur*):
$\{<MIN_{BLUR}, d>: MIN_{BLUR} <_{DRY} d\}$

c. SOC set for verbs without a maximum or minimum degree (e.g. *widen*):
$\{<d,e>: d <_{WIDE} e\}$

(Pedersen, 2015, pp. 395)

As already noted in the previous section, under a degree vector approach to

[34]Since both starting and ending degrees are specified in a degree vectors approach and change can be calculated by finding the difference between the two degrees in a vector, it can account for measure phrases that specify the degree of change, the starting degree, or the ending degree. For example, one can analyze measure phrases like *to 9 inches* in *Gap A widened to 9 inches* as specifying the second degree in the degree vector denoted by *widen*. Compositionally, this can be implemented in a variety of ways, such as having the preposition *to* do the semantic work, taking a degree and a degree vector as arguments and specifying the second member of the degree vector built out of the measure function. Other measure phrases can be analyzed the same way by having prepositions like *from (8 inches)* or *by (8 inches)* carry the semantic load. Spelling this out precisely is not within the scope of this chapter and I leave this for future work.

deadjectival verbs in general, characterizing *again*'s low scope presupposition as restitutive is a misnomer, as there is simply no state of possessing a property available for modification. Rather, a restitutive presupposition is reanalyzed as a counter-directional one, reversing the directionality of the two degrees within the degree vector that a deadjectival verb denotes, as shown in (3.89) (Pedersen, 2015). This is indistinguishable from an analysis where *again* takes low scope for deadjectival verbs, modifying a constituent containing either POS or COMP as proposed by von Stechow (1996), since they capture the observed facts with *again*-ambiguities equally well.

There are, however, clear empirical arguments against a degree-based semantics for deadjectival verbs and indeed, adjectives too. First, one might make the simple observation that adjectives take modifiers that typically modify eventive predicates, such as locatives or temporal modifiers (e.g. Moltmann, 2009; Wellwood, 2015; Baron, 2018, a.o.). Note that these are pure predicative and stative contexts and there is simply no eventive component. Therefore, one cannot say that the modifiers are modifying an event variable; rather, the modifiers must truly be modifying a state of holding a property. Analyzing adjectives as measure functions would obscure the parallels with simple eventive predicates in regards to locative and temporal modifiers.

(3.96) a. Mary ran in the morning.
b. The river is wide in the morning.
c. Mary ate in the park.
d. The children are happy in the park.

In fact, Moltmann (2009) shows that adjectives take modifiers that describe *the way in which an object manifests a property* and clearly do not involve degrees; degree-based approaches would hence have no way to account for these since in such approaches, adjectives do not denote an object being in a state but rather,

a degree on a scale of some scalar property.

(3.97) a. exquisitely / strangely beautiful
b. visibly / perceivably happy
c. fatally / exhaustingly weak
d. deliberately silent
e. remarkably / shockingly / surprisingly tall

Moving beyond *again*-ambiguities and examining other kinds of sub-lexical modifiers also leads to the same conclusion that states are necessary in the analysis of deadjectival verbs. The basic observation is that there are sub-lexical modifiers in English that seem to target a stative constituent with deadjectival verbs and do not necessarily make reference to scalar notions involving degrees or differences in degrees (Lechner et al., 2015). One such example in English is the additive focus-sensitive particle *too*. Putting aside the precise formulation of its semantics, we see that it can target a constituent informally paraphrasable as *x is P* with change-of-state verbs like *open*, introducing a presupposition that *some contextually relevant alternative to x is also P*. Note the crucial part of the context underlined below; the door was *built open* and had never undergone a transition from closed to open (Embick, 2009), in line with the contexts that I have been utilizing throughout this chapter. This shows that one cannot analyze *too* as targeting a constituent denoting a degree measuring a change of an object holding a property and must truly be modifying a stative constituent denoting *the door is open* i.e., a constituent with positive semantics in the terminology of degree-based analyses.

(3.98) CONTEXT: There was a door in the room which was built open. <u>It had never been closed before.</u> There was also a window in the room which was closed. Mary walked into the room and wanting more fresh

air in the room, she opened the window and so...
✓ Mary opened the window too.

At this point, one might perhaps simply argue that change-of-state verbs built out of closed scale adjectives are a different class from DAs, and DAs should receive a degree-based analysis while change-of-state verbs should receive a stative one. One argument for this position might be that *too* in fact does not produce the stative reading observed with *open* with DAs like *widen*.[35] Rather, *too* must target an eventive constituent denoting change i.e., a widening event rather than a constituent that denotes *an object is wide*.

(3.99) a. CONTEXT: To farmers who irrigate their crops using waters from rivers, a river is generally considered wide when they are 20 feet or more across. River A is 20 feet across and river B is only 10 feet across. Farmer C, who depends on river B to irrigate his crops, decides to pump rainwater he collected over the monsoon season to widen river B and ensure his crops are properly irrigated so...

[35]This generalization, in fact, does not hold up cross-linguistically. As discussed by Spathas (2019) and Spathas and Michelioudakis (to appear), DAs built out of open scale adjectives can have a stative presupposition with the additive, focus-sensitive particle *ke* 'also' in Greek (examples (27) and (28) from Spathas, 2019). Note that the milk had never undergone a transition from being cheap to being expensive, and that a stative presupposition is still possible. This observation leads them to essentially argue for the ambiguity analysis of von Stechow (1996), where DAs are structurally ambiguous between a POS and COMP interpretation.

(i) CONTEXT: Bread and milk are considered expensive if they cost more than 2 dollars per kilo. John opened a bakery in January and set the price of milk to 3 dollars and that of bread to 1 dollar. In February, he raised the price of bread to 4 dollars so...

Akrivine ke to PSOMI.
expensive.V also the bread

'The bread got expensive too.'

The farmer widened river B too.

b. CONTEXT: River A, who farmer C depends on to irrigate his crops, is 15 feet wide. River B, who farmer D depends on to irrigate his crops, is 10 feet wide. Farmer C pumps rainwater into river A to get it to 20 feet across in preparation for the dry summer season. Farmer D, who received advice from farmer C, decides to do the same and pumps rainwater into river B till its width reached 20 feet so...
✓ The farmer widened river B too.

Note, however, that what the above examples are showing is that *widen* never has a positive interpretation such that the river is wide; the lack of a positive interpretation *does not mean that there is no stative constituent in its semantics*. We can detect the presence of a stative constituent using familiar tests, such as durative temporal modifiers headed by prepositions like *for*. As has been noted since the Generative Semantics tradition (e.g. Dowty, 1979, a.o.), durative *for*-phrases can target a stative constituent in deadjectival verbs built out of closed scale properties like *open*, indicating that the state of being open persisted for a period of time.

(3.100) CONTEXT: Mary opened a door and it remained open for the next two hours before the wind blew the door shut so...
✓ Mary opened the door for two hours.

We can similarly show that *for*-phrases can target a stative constituent with DAs. Notably, it does not target a state that has a positive interpretation but a state that has the *comparative interpretation* (von Stechow, 1996), as illustrated in the context below.[36]

[36]The context is based on the contexts built for directed motion verbs that also denote scalar properties on open scales like *ascend* and *descend* in Ausensi, Smith, and Yu (2020a).

(3.101) CONTEXT: Farmer A decided to plant some crops next to river B, which was 10 feet wide. Wanting to use the river water for irrigation but feeling like it was not wide enough, farmer A pumped rainwater he collected over the monsoon season into the water over 2 hours, widening the river from 10 to 15 feet wide. Over the next two months, the river remained 15 feet wide until the dry summer months when it narrowed back to 10 feet so...

✓ The farmer widened the river (to 15 feet) for two months (before it narrowed back to 10 feet).

Two things are worth noting here. In this context, what had persisted for two months is the end state of the widening event, in particular the river being 15 feet wide. However, there is no positive interpretation such that *the river is wide for two months*; rather, the interpretation is that *the river is wider than it previously was for two months*. Importantly, one cannot possibly construe *for two months* as specifying the duration of the event of pumping rainwater into the river, as the given context specifies that the duration of this event lasted only two hours. Since it is acceptable to assert this sentence containing the *for*-phrase in this context, it shows that what is being targeted by *for two hours* is a stative constituent, though one denoting comparative and not positive semantics.

That there is a stative constituent which other kinds of sub-lexical modifiers outside of *again* can target is left unaccounted for by the scalar analyses reviewed here. To recap why this is so, remember that MOCs and degree vectors, which are the constituents that denote changes in degrees and hence provide the degree the object holds at the end of an event, are not predicates of events but functions that return either a degree or a degree vector. These are converted into properties of individuals and events only *after* the introduction of POS_v. Durative temporal *for*-phrases that specify the duration of eventualities (events and states) can hence attach only after POS_v is introduced.

(3.102) $[\![\text{POS}_v\ \text{m}_\Delta]\!]$: $\lambda x.\lambda e.\text{m}_\Delta(x)(e) \succeq \text{STND}(\text{m}_\Delta)$ (Kennedy and Levin, 2008)

(3.103) $[\![\text{POS}_v$ wide-en$]\!]$: $\lambda x.\lambda e.<\text{WIDTH}(x)(\text{INIT}(e)),\ \text{WIDTH}(x)(\text{FIN}(e))> \in \text{SOC}_{wide}$ (Spathas, 2019)

In these approaches, the only event variable available for *for*-modifiers to modify is the one associated with *the event of change* as shown in the denotations above. In other words, they predict that durative modifiers should always specify the amount of time that the event of change persisted. As already shown in (3.101), this is not borne out and there is indeed a stative constiuent that can be targeted, even if it is not a constituent that produces a positive interpretation. Coupled with the fact that other kinds of sub-lexical modifiers like *too* can target a stative constituent with deadjectival verbs formed out of closed scale adjectives (which under a scalar analysis is unified with those formed from open scale ones), I take it then that there is empirical motivation for postulating states in the analysis of deadjectival verbs in general and the relevant difference between open and closed scale deadjectival verbs lies in the interpretation of their stative constituents (as in von Stechow, 1996). The next section sketches a preliminary compositional analysis implementing this intuition.[37]

3.6.3 A Compositional Sketch of a State-based Analysis

The analysis I will pursue here is essentially that of von Stechow (1996), where the presupposition produced when *again* attaches low in deadjectival verbs is a stative constituent i.e., a restitutive presupposition. I will adopt an analysis where the roots of deadjectival verbs, whether change-of-state or DAs, are functions that

[37] Wellwood (2015) discusses how nominals and events can also appear in comparative structures and they clearly do not involve degree-based semantics, while Baron (2020) shows in detail how source and goal measure phrases pose more compositional problems for degree-based analyses utilizing MOCs. I will not review their arguments here but the reader is invited to consult these works for more details.

return a predicate of states i.e., they are degree-less and simply denote states, containing a state variable (e.g. Parsons, 1990; Wellwood, 2015; Baron, 2018, 2020; Bochnak et al., 2020, a.o.). Beginning with change-of-state verb roots, which I have previously analyzed as simply functions of type $<s,t>$ to account for their bound quantificational restitutive presuppositions with *again*, the main task is to determine how their positive interpretation is derived. Here, I will follow Bochnak et al. (2020) in noting that analyzing these roots as states is in principle compatible with either a degree analysis postulating POS as in Kennedy (2007), or with a degreeless analysis where the positive inference is derived through pragmatic strengthening (Rett, 2015), or domain restriction when the state variable is existentially bound (Francez and Koontz-Garboden, 2017). For concreteness, I will assume the degreeless analysis of Francez and Koontz-Garboden (2017), where existential quantification over state variables after all the arguments have been combined is contextually restricted to some standard measures.

(3.104) $[\![\exists$ Kim is tall$]\!] = 1$ iff $\exists^{D}\mathrm{e}_s[\textsc{tall}(kim,\mathrm{e}_s)]$, where D is a contextual domain restriction to 'tall enough' states

We may now move on to DAs which denote changes in properties on open scales. Recall that in the previous section, I argued that *again* and durative *for*-phrases should target some stative constituent even in DAs, and that the appropriate stative constituent is one with a comparative rather than positive interpretation. We saw as well that *again* can attach directly to a change-of-state verb root to produce bound restitutive presuppositions that have positive semantics. To capture this difference in the availability of presupposition with positive semantics, I propose that the roots of DAs with open scales like $\sqrt{\text{WIDE}}$ are of a different semantic type than those for change-of-state verb roots such that *again* cannot attach directly to them. Specifically, I will propose that they are functions from individuals to predicates of states of type $<e,<s,t>>$. In this way, *again*

will never be able to presuppose a prior state which is interpreted with positive semantics.

It now remains to outline the semantics and compositional steps required to produce the stative constituent with comparative semantics. This was already proposed in von Stechow (1996, pp. 125); in his analysis, *again* attaches to a stative constituent containing a comparative operator MORE with degree abstraction over the starting and ending state of the object (Heim, 1985), as illustrated below using an English example with *widen* and the relevant stative constituent underlined.

(3.105) The river widened again.

BECOME(*again*(λs(MORE(λd.d-WIDE$_s$(*the river*),λd.d-WIDE$_{\text{INIT}(e)}$(*the river*)))))(e)

A crucial piece of von Stechow's (1996) analysis lies in the state/degree that serves as the standard of comparison; as indicated in the constituent underlined above, this is provided by INIT(e), which returns a measure of the state that the object holds at the beginning of the event introduced by BECOME. In this way, the presupposition introduced by *again* will be paraphrasable as *there was a prior state such that the river was wider than it is at the beginning of the event at utterance time*.[38] Coupled with the semantics of BECOME or Bale's (2007) semantics for *again*, this means that the river must be previously wider than at the beginning of the event, then not wider than the beginning of the event, before the event of widening makes the river become wider than at the beginning of the event i.e.,

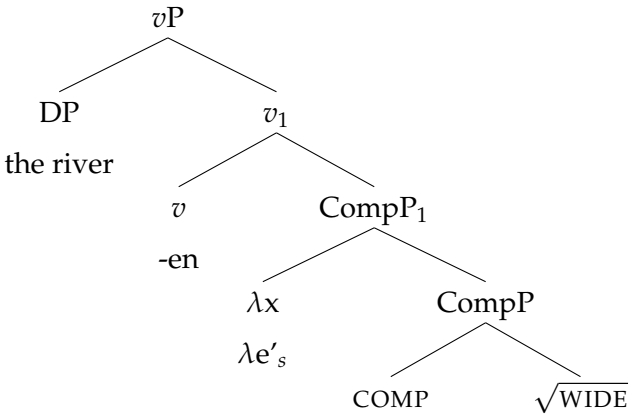
[38]Pedersen's (2015) successive change reading can be captured in von Stechow's (1996) analysis and the analysis being proposed here the usual way, by having *again* attach above BECOME or *-en* i.e., a repetitive reading. The presupposition produced can be paraphrased as *there was a previous event that led to the river being wider than it was at the start of that event*. This presupposition will be satisfied by contexts where there was simply a previous widening event and then the river widened once more, or where there was a previous widening event, then a narrowing event, and then a widening event once more.

there must be a *reversal* such that the river is not wider than at the start of the event in an intermediate temporal interval. This captures the correct interpretation of *again*'s restitutive presupposition with DAs. However, note that von Stechow (1996) argues explicitly for an *event decomposition* account of *again*-ambiguities. This means that the stative constituent should contain only state variables, and that event variables are introduced by higher eventive v heads like the BECOME operator. It is unclear how the stative constituent underlined in (3.105) comes to contain an event variable such that INIT(e) can provide a standard of comparison that is set to the beginning of the event, which is itself introduced higher up in the structure by BECOME. In other words, while we want the stative constituent to indeed be comparing the state that the object holds to the state that the object holds at the beginning of the change event, there is a compositional problem because the decomposed event structure does not in fact give access to the change event in the stative constituent.

I will instead propose a degreeless account where the stative constituent does contain only state variables, such that there are two states whose measures are being compared. Following Wellwood (2015) and Bochnak et al. (2020) amongst others, I assume the measure of a state is provided by the function μ, which takes a state as an argument and returns a measure of it on the scale provided by the state or some other contextually relevant scale.[39] The state variable representing a standard of comparison is provided by a comparative operator COMP. I will take the setting of the state that serves as the standard of comparison to the state held at the beginning of the change event to be the semantic contribution of the morphology of DAs, namely the *-en* suffix. The syntactic and semantic composition is illustrated as below.

[39]The measure function μ can also be type-neutral to account for comparisons in the nominal and event domain, with a monotonicity principle regulating the kind of scales these domains can be measured on as in the theory of Wellwood (2015).

(3.106) The river widened.



(3.107) a. $[\![\sqrt{\text{WIDE}}]\!]$: $\lambda x.\lambda e_s.\text{WIDE}(x,e_s)$

b. $[\![\text{COMP}]\!]$: $\lambda P_{<e,st>}.\lambda e_s[P(x)(e_s) \wedge P(x)(e'_s) \wedge \mu(e_s) \succeq \mu(e'_s)]$

c. $[\![\text{CompP}]\!]$: $\lambda e_s[\text{WIDE}(x,e_s) \wedge \text{WIDE}(x,e'_s) \wedge \mu(e_s) \succeq \mu(e'_s)]$

d. $[\![\text{CompP}_1]\!]$: $\lambda x.\lambda e'_s.\lambda e_s[\text{WIDE}(x,e_s) \wedge \text{WIDE}(x,e'_s) \wedge \mu(e_s) \succeq \mu(e'_s)]$

e. $[\![\text{-en}]\!]$: $\lambda P_{<e,<s<s,st>>>}.\lambda x.\lambda e.\exists e_s \exists e'_s[P(e_s)(e'_s)(x) \wedge e_s = \text{FIN}(e) \wedge e'_s = \text{INIT}(e)]$

f. $[\![v_1]\!]$: $\lambda x.\lambda e.\exists e_s \exists e'_s[\text{WIDE}(x,e_s) \wedge \text{WIDE}(x,e'_s) \wedge \mu(e_s) \succeq \mu(e'_s) \wedge e_s = \text{FIN}(e) \wedge e'_s = \text{INIT}(e)]$

g. $[\![vP]\!]$: $\lambda e.\exists e_s \exists e'_s[\text{WIDE}(\textit{the river},e_s) \wedge \text{WIDE}(\textit{the river},e'_s) \wedge \mu(e_s) \succeq \mu(e'_s) \wedge e_s = \text{FIN}(e) \wedge e'_s = \text{INIT}(e)]$

There is one thing of note in the above structure and semantic composition, namely that the COMP operator provides an unbound individual variable x and and an unbound state variable e'_s in the CompP constituent in (3.107c). This is, as far as I know, non-standard in the semantics of the COMP operator, whether degreeful or degreeless. However, I will argue this is necessary in a stative degreeless analysis precisely because of the restitutive presupposition of *again* with DAs. Having unbound variables here will ensure this is a type $<s,t>$ consitituent, which can then serve as an argument for *again* of type $<<s,t>,<s,t>>$. This produces a presupposition that there was previously a state such that this state is

of a greater measure than the unbound state variable, and then there was an intermediate temporal interval such that there was no such state, before the state comes to hold at utterance time. There is, of course, no temporal ordering in the presupposition of the variables e_s and e'_s; these will be provided in the assertion after *-en* has combined, producing the final assertion in (3.107g) and setting the two state variables to FIN(e) and INIT(e) respectively.[40]

(3.108) PRESUPPOSITION: $\exists e^1{}_s \exists e^2{}_s [e^1{}_s \prec e^2{}_s \prec e_s \wedge [\text{WIDE}(x,e^1{}_s) \wedge \text{WIDE}(x,e'_s) \wedge \mu(e^1{}_s) \succeq \mu(e'_s)] \wedge \neg[\text{WIDE}(x,e^2{}_s) \wedge \text{WIDE}(x,e'_s) \wedge \mu(e^2{}_s) \succeq \mu(e'_s)]]$

Note now that we can derive the reversal presupposition of DAs (Pedersen, 2015) without postulating a different version of *again* that operates on degree vectors; *again* as an eventive modifier can attach to a state denoting comparative semantics. Additionally, there is also now a stative constituent that can be modified by durative *for*-phrases, which is the constituent in (3.107c), the precise constituent that *again* attaches to in order to produce a restitutive presupposition. Attaching a durative *for*-phrase here should denote the final state e_s holding for some amount of time as desired and illustrated previously in (3.101). In addition, I wish to point out two other observations of such an analysis involving degree-less stative constituents.

First, as noted previously, it is unclear in von Stechow (1996)'s analysis how the comparative operator (MORE) is provided with an event variable such that the standard of comparison is set to the state held at the beginning of the event. In addition, one would have to suggest that in pure stative and comparative constructions like *Mary is taller than John*, the comparative operator would need to be a different one than that found in DAs. This seems undesirable, as we expect the core of comparative constructions to be similar whether eventive or stative.

[40] I thank Ryan Walter Smith (personal communication) for extensive discussion about how to implement this analysis, a version of which is presented in Ausensi, Smith, and Yu (2020a).

In fact, there seems to be some positive evidence that at least in some languages, deadjectival verbs are built out of the stative comparative forms (Bobaljik, 2012, pp. 170). Hence, I take this to mean that it is desirable to have a common stative comparative core in the derivation of deadjectival verbs, and providing an identical semantics for COMP which compares the measures of two states helps to capture this observation.

(3.109)

	POS	COMP	VERB	
English	**good**	**bett**-er	(to) **bett**-er	
English	**bad**	**worse**	(to) **worse**-en	
German	**gut**	**bess**-er	ver-**bess**-er-n	‘good’
(Late) Latin	**bon**-us	**mel**-ior	**mel**-iōr-o	‘good’

A second observation is that the analysis presented for DAs here is akin to the analysis I proposed for the inchoative variant of change-of-state verb roots, such that there is a bound variable in the stative constituent saturating an argument position prior to the introduction of an eventive verbalizing v, which introduces the argument that abstracts over and binds this variable.[41] Recall further that this is a key difference between the lexical causative and the inchoative, with the causative containing an additional stative v head that introduces the argument binding the unbound variable. This accounted for the unavailability of a quantificational restitutive presupposition with *again* in the inchoative. Since the analysis of DAs is similar to the inchoative, we expect to see that DAs in general should simply lack quantificational restitutive presuppositions with *again* when the DP undergoing the change is an indefinite. This prediction is borne out; a quantificational restitutive presupposition is unavailable and only a quantificational repetitive presupposition is available with DAs modified by *again*, as the following contexts show. This hence provides another piece of evidence that the analysis here is on the right track regarding the kinds of predictions it makes.

[41] This aspect of the analysis is also shared by von Stechow’s (1996) analysis in (3.105).

(3.110) a. CONTEXT: There are are two rivers, river A and river B. River A was 20 feet wide, river B 15 feet wide. River A shrunk to 15 feet wide because a farmer used water from the river to irrigate his crops. The farmer then pumped his waste water into river B and river B reached 20 feet wide so...

A river widened (to 20 feet) again.

(*quantificational restitutive presupposition*)

b. CONTEXT: There are two rivers, river A and river B. River A was 20 feet wide and river B was 15 feet wide. Due to the monsoon rains, river A increased to 25 feet wide. After a week, a farmer pumped more rainwater into river B to irrigate his crops and river B widened to 20 feet wide so...

✓ A river widened again.

(*quantificational repetitive presupposition*)

Before closing, a caveat might be in order. I have attributed the setting of the standard of comparison in DAs to the state held at the beginning of the change event to the semantics of the *-en* morphology. The reader might have noted, however, that *-en* also appears with what I am calling change-of-state verb roots denoting closed scale properties, such as *flatten* and *straighten*, which do produce stative constituents with positive semantics. This raises the question then of why *-en* has to potentially receive two different meanings based on the identity of the root it attaches to. I will argue, however, that this is precisely where the assumptions of DM give us a handle on explaining this. Recall that DM denies the traditional form-meaning pairing, instead splitting this pairing up into a form-terminal node and terminal node-meaning pairing. Under this view, we might view *-en* simply as the morpho-phonological spellout of a verbalizing little v in particular environments, conditioned here by root identity (regardless of the intermediate structure, if any). Verbalizing v is spelled out as *-en* in the context

of certain roots and as null in the context of other roots, regardless of whether they denote properties on open or closed scales. I provide a set of phonological spellout rules below illustrating this.

(3.111) a. $v \rightarrow$ *-en* / [___ [... ... $\sqrt{\text{WIDE}}$ / $\sqrt{\text{SHORT}}$ / $\sqrt{\text{BROAD}}$ / $\sqrt{\text{STRAIGHT}}$ / $\sqrt{\text{FLAT}}$ / ...]]

b. $v \rightarrow \varnothing$ / [___ [... ... $\sqrt{\text{OPEN}}$ / $\sqrt{\text{CLOSE}}$ / $\sqrt{\text{DRY}}$ / $\sqrt{\text{COOL}}$ / $\sqrt{\text{RISE}}$ / ...]]

On the other hand, v can receive different semantic interpretations, again conditioned by root identity, even if it receives the same phonological spellout at the phonological component. That is, just as terminal nodes can receive phonological spellout conditioned by surrounding structure, so too can terminal nodes receive conditioned semantic interpretations based on the surrounding structural context i.e., *contextual allosemy* (Wood, 2012; Myler, 2014; Wood and Marantz, 2017). Crucially, the two sets of conditioning contexts can be disjoint, and we can take advantage of this to explain the different meanings that can be attributed to *-en*. Within the class of roots that combine with *-en*, *-en* will be interpreted as BECOME with those roots among the class that are closed scale, while in the context of open scale roots it will be interpreted as imposing conditions on the temporal ordering of states as in (3.107e). A set of semantic spellout rules that captures this observation is provided below.

(3.112) a. $[\![v]\!] \rightarrow \lambda P_{<e,st>}.\lambda x.\lambda e.\exists e_s[\text{BECOME}(e,e_s) \wedge P(x)(e_s)]$ / [___ [... ... $\sqrt{\text{STRAIGHT}}$ / $\sqrt{\text{FLAT}}$ / ...]]

b. $[\![v]\!] \rightarrow \lambda P_{<<e,<s<s,st>>>,<e,st>>}.\lambda x.\lambda e.\exists e_s \exists e'_s[P(e_s)(e'_s)(x) \wedge e_s = \text{FIN}(e) \wedge e'_s = \text{INIT}(e)]$ / [___ [... ... $\sqrt{\text{WIDE}}$ / $\sqrt{\text{SHORT}}$ / $\sqrt{\text{BROAD}}$ / ...]]

Dissociating phonological spellout from semantic spellout, and having terminal nodes as the underlying primitive that receives both conditioned phonologi-

cal spellout and conditioned semantic interpretation, therefore allows us to capture the observations about *-en* and avoid having to assign two different lexical entries to capture its different semantic interpretations in the context of different roots.

3.7 Chapter Summary

In this chapter, I utilized the restitutive presupposition of *again*-modification as a probe into the general representation of internal arguments and the kinds of structures that verbal roots can be embedded in and their corresponding semantic interpretations. Beginning with change-of-state verb roots denoting properties on closed scales and participate in the lexical causative-inchoative alternation, I showed that with quantificational internal arguments, an ambiguity arises in the kinds of restitutive presuppositions observed: a bound and quantificational restitutive presupposition. Intuitively, this had to do with whether the holder argument of a state is identical across both presupposition and assertion. Formally, it amounts to whether a quantifier, like the existential quantifier of an indefinite DP, scopes below or above *again*'s presupposition. I showed that small clause analyses combined with a rule of QUANTIFIER RAISING cannot capture the ambiguity because of the lack of the ambiguity in the inchoative. Based on these facts, I argued that in the lexical causative, the result constituent has more functional structure than in the inchoative and crucially, there exists a constituent with an unbound variable saturating the verb root's argument position, which is abstracted over higher up in the structure. I took this to be the semantics of the verbal root, which produces the bound restitutive presupposition when *again* attaches directly to the root. At the same time, I also argued against analyses that posit a structurally represented BECOME component based on arguments previously presented in the literature as well as the difficulty in capturing the different

restitutive presuppositions.

Moving on, I reviewed some arguments in the literature against a polysemy account of *again*-ambiguities, and also reviewed subtly different implementations of a scope-ambiguity account. Here, I again showed that quantificational internal arguments allow us to tease apart the predictions of different implementations of a scope-ambiguity account, ultimately arguing for one where negation of the result state is explicitly represented in *again*'s presupposition. I then moved away from *again* to examine *re*-prefixation, a morphological process in English argued to also produce restitutive presuppositions. Based on the fact that *re-* allows only a bound restitutive presupposition across lexical causatives and inchoatives, I proposed that *re-* has identical semantics as *again*, differing only type-theoretically in what kind of argument they require. I then reviewed particular analyses of the argument structure of verb roots based on the facts with *re*-prefixation, particularly analyses that posit that DPs can be interpreted as stative rather than as entitites. I showed that such analyses make wrong predictions about the kinds of restitutive presuppositions available and should be ruled out.

Finally, I discussed another class of deadjectival verbs, namely DAs, which I take to be verbs formed from roots that denote properties on open scales. I reviewed approaches that proposed these roots are measure functions and that unify change-of-state verbs and DAs under a single scalar analysis, showing some conceptual and empirical problems with these approaches. The major issue here is that once we look outside of *again*-ambiguities, there are other kinds of modifiers that can target sub-lexical constituents that must crucially be stative, and stative constituents are not available under the kinds of scalar analyses reviewed. I went on to propose a compositional sketch of how such stative constituent might arise, focusing on the differences in structures and interpretations between change-of-state verbs roots and the roots that form DAs, ultimately arriving at a view where these verb roots have different semantic types and are

also embedded in different structures that receive different semantic interpretations. The upshot of the proposed analysis is that it allows for an explanation of not just *again*-ambiguities with DAs, but also provides a straightforward way of accounting for other kinds of sub-lexical modifiers targeting stative constituents.

CHAPTER 4

Conclusion

In this dissertation, I embarked on a detailed investigation of the range of repetitive and restitutive presuppositions that *again* can produce with different verb root classes in English, and drew conclusions on how these verb roots associate with their arguments based on these observations.

Chapter 2 discussed in detail a kind of repetitive presupposition *again* produces that does not include the subject, which has been argued in the literature to be available only with non-stative transitive verbs but not with intransitive verbs. This led to a more nuanced view of the status of external arguments, suggesting that external arguments must truly be external and are severed from the verb/root only with non-stative transitive verbs and not other kinds of verbs. However, I provided evidence from two classes of transitive verbs, namely *murder*-type verbs and verbs of stealing, that argued against this generalization. The key empirical observation is that *murder*-type verbs disallow subjectless presuppositions and require that any event satisfying *again*'s presupposition must contain the same agent as the asserted event and also be intentionally carried out. Verbs of stealing, on the other hand, require the presupposed prior event to be intentionally carried out, but not necessarily by the same agent. These observations lead to issues with the generalization noted above, and for theories where the external argument is syntactically and semantically severed from all verbs and how they are implemented syntactically and semantically.

Building further on the observation that these two root classes also do not permit restitutive presuppositions with *again* even though well-established diagnostics show that they contain a result state in their semantics, I proposed that

entailments of causation, intentionality, and the external argument can all be semantically present within a root prior to insertion into a syntactic event structure. With *murder*-type verb roots that have all three of these entailments, the syntactic structure, assumed to be the locus of entailments of agency, causation, and the external argument within event decomposition theories, is rendered semantically inert and serves only to syntactically introduce the external argument without imposing semantic conditions on it. All semantic conditions on the external argument as well as the interpretation of the event is located solely in the root. Verbs of stealing are similar in containing entailments of intentionality and causation, but do not semantically represent their external arguments. Because external arguments do not receive their interpretations within the roots of verbs of stealing, some aspects of the syntactic structure retain the entailments they usually introduce in order to derive the desired semantic interpretations. The analysis presented hence argues against various hypotheses that seek to constrain the kinds of semantic entailments verbal roots can contain, as well as those that impose a strict division of labor between the lexical semantic entailments of roots and the semantic entailments introduced by functional heads within a syntactic event structure.

Chapter 3 examined restitutive presuppositions of *again* with change-of-state verb roots, which I take to be deadjectival verbs built out of roots that denote properties on closed scales. The key empirical observation here is that when the holder argument of the change-of-state verb is quantificational, in particular indefinite, there can be two kinds of restitutive presuppositions produced with *again*. Intuitively, these are paraphasable as whether the entity that holds the result state in *again*'s presupposed prior event is identical as the one that holds the result state in the asserted event, what I call a bound and quantificational restitutive presupposition. Crucially, an ambiguity between these two kinds of restitutive presuppositions arises only for the transitive lexical causative but not

the intransitive inchoative variant for change-of-state verbs. This poses problems for analyses of the causative-inchoative alternation that postulate a shared result core for the causative and inchoative, since that predicts both variants to show the restitutive ambiguity.

Building off that observation, I proposed that the causative variant of change-of-state verbs contains more articulated functional structure within the result core, with the quantificational argument being introduced by a stative verbalizing *v* head that the inchoative lacks. The quantificational argument in an inchoative is introduced by an eventive rather than stative verbalizing *v* head. This accounts for the lack of a restitutive ambiguity in the inchoative, with the difference down to the number of stative constituents available for *again* to attach. I then showed that quantificational arguments provide an argument that the reversal requirement of restitutive presuppositions should be represented explicitly in the presupposition of *again*, contra lexical ambiguity analyses of the repetitive-restitutive ambiguity and scope-based analyses that represent reversal in other eventive operators like BECOME.

I then examined another morphological process argued to produce restitutive presuppositions, namely *re*-prefixation. I showed that this process differs from *again* in that it never produces a restitutive ambiguity, and provided an explicit formal analysis of *re-* that suggests it differs from *again* type-theoretically and in the kinds of stative constituents it can attach to. Finally, I discussed another class of deadjectival verbs built out of roots that denote properties on open scales, which I label degree achievements. These have been observed to produce different kinds of presuppositions with *again*, prompting many to propose that we should move away from event decomposition analyses toward a scalar one. The advantage of scalar analyses is that they take seriously the observation that the lexical semantics of the underlying roots, in particular the kinds of scalar properties they denote, predict a range of inferential properties in their verbal

counterparts. I show some conceptual and empirical problems that scalar analyses face, suggesting that they do not capture the full range of sub-lexical modifiers that deadjectival verbs can combine with and the semantic interpretations they produce. Based on these observations, I argue for a return to a decompositional, structural ambiguity analysis based on events and states, differentiating between change-of-state and degree achievement verb roots and assigning them different semantic types and different structural configurations. This not only captures the difference in *again*-ambiguities between the two classes of deadjectival verbs, but also provides a platform to analyze other kinds of sub-lexical modifiers within a state-based analysis.

To close this dissertation, I wish to point out two other issues that I have thus far not discussed in the preceding chapters, one concerning a broader conceptual question and the other, cross-linguistic. Beginning with the conceptual issue, the analyses I have presented in both chapters both propose that syntactic transitivity can be separated from semantic transitivity. Concretely, I have proposed that certain classes of roots can *semantically contain argument positions*, but the actual arguments that saturate these argument positions are actually *syntactically introduced outside the immediate domain of the root* by other functional heads in the verbal spine. This hence represents a hybrid position, such that a root neither associates with its arguments completely externally nor completely internally. The empirical observations and analysis, particularly those in chapter 2, argue that when it comes to the external argument, one cannot completely sever the external argument both syntactically and semantically from the verb/root for all classes of verbs, even though there are well-accepted arguments for this position and against verbs/roots directly introducing their external arguments. What is less clear, from the observations and analysis presented in chapter 3, is whether there are clear arguments against syntactically and semantically severing internal arguments completely from the verb/root as well, given that I have argued that

they should be syntactically but not semantically severed. There is, in fact, a long tradition of such a position based on various empirical arguments (e.g. Schein, 1993; Borer, 2003, 2005, 2014; Cuervo, 2003, 2014; Alexiadou, 2014; Ahn, 2020, a.o.). I will focus here on a particular morphosyntactic argument in English that internal arguments should be severed even with roots that are not change-of-state roots (contra Cuervo, 2003, 2014 who argues for this position with (at least some) change-of-state roots), in particular *out*-prefixation as discussed in Ahn (2020).

Ahn (2020) observes that *out*-prefixation in English obligatorily creates a transitive structure, regardless of the kind of verb it prefixes to. Semantically, an *out*-prefixed predicate (*out*-PRED) denotes a situation where both the subject and object bear the same kind of thematic interpretation in relation to an event, and that the subject performs the event denoted by the verb to a greater/better degree than the object does. The transitive structure *out-* imposes can be built on top of both intransitive and transitive predicates. With intransitives, the net effect is that there is an argument added when an intransitive predicate is prefixed with *out-*, as demonstrated below with both unaccusative and unergative predicates (Ahn, 2020, pp. 11).

(4.1) Unaccusative

a. The fidget spinner will spin when you click on it.

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

(4.2) Unergative

a. The students will think (about syntax).

b. The students will out-think the teachers.

What is more crucial for the status of internal arguments is that with transitive predicates, *out-* imposes its own argument structure upon the predicate, appearing to 'suppress' in particular the original internal argument. This can be detected simply by observing the thematic interpretation of *out*-PRED's internal

argument, which must bear the same thematic interpretation as the subject rather than the thematic interpretation the predicate usually assigns to its internal argument, as well as whether the original internal argument of the predicate can be expressed. As shown below, the original internal arguments of the stems *out-* attaches to can never be expressed as a syntactic objects, and must instead be expressed periphrastically in addition to the object *out-* introduces (Ahn, 2020, pp. 13).

(4.3) 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.

(4.4) 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.

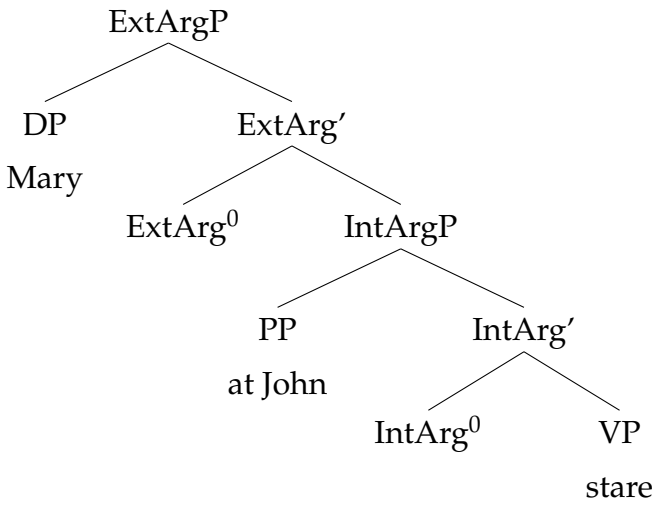
This, Ahn (2020) argues, presents a conundrum if it is assumed that word-formation can build on top of the semantic contribution of the input stem, but can never *remove* lexical semantic information from it. This is expressed explicitly in the MONOTONICITY HYPOTHESIS described below (e.g. Koontz-Garboden, 2007, a.o.).

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

Given the MONOTONICITY HYPOTHESIS and the fact that *out-* imposes its own argument structure on its stem and prevents the stem's own internal argument from being expressed, Ahn (2020) concludes, following Schein (1993), Borer

(2003, 2005), and Alexiadou (2014), amongst others, that the internal argument of a verb/root must also be severed, just like its external argument as proposed by Kratzer (1996). In this way, *out-* is never suppressing the stem's internal argument because it does not have an internal argument; these are expressed by functional heads within the verbal spine. All roots are therefore functions from events to truth values, with internal and external arguments being introduced through functional heads in the verbal spine through compositional rules that conjoin the denotations of terminal nodes (Schein, 1993), such as EVENT IDENTIFICATION proposed by Kratzer (1996). An example of a lexical entry and the embedding structure for the verb *stare* is shown below in (4.6), and the corresponding syntax and semantics for *out-stare* in (4.7) (Ahn, 2020, pp. 19-20).[1] [2]

(4.6) a. Mary stared at John.



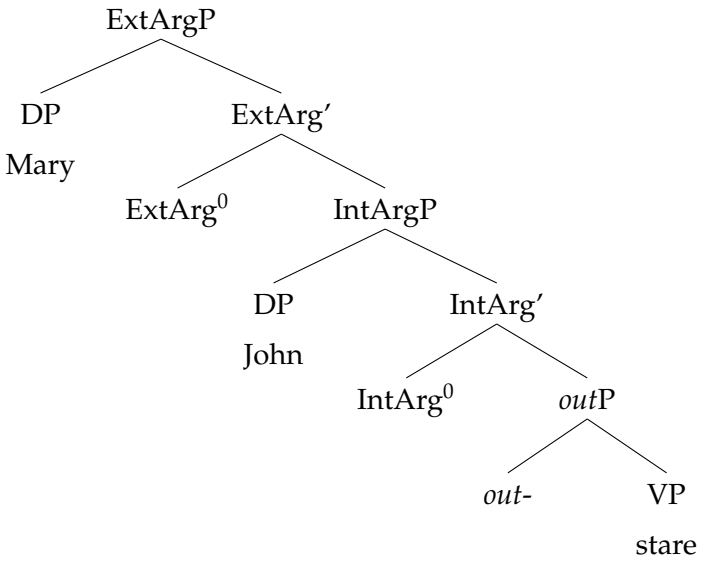
[1] I represent thematic roles here in a Neo-Davidsonian fashion, being functions that take events as their arguments and return the unique individual that stands in a particular relation to the event (Schein, 1993; Krifka, 1998; Champollion, 2010, a.o.). This is to capture the proposal that they are not part of the verb root's semantics and are added to the overall denotation through combining with argument-introducing functional heads.

[2] I add an event variable to Ahn's (2020) original semantics for *out-*, which is necessary for composition with thematic roles and with *again*.

b. ⟦stare⟧: λe.STARE(e)

c. ⟦ExtArgP⟧: λe[STARE(e) $\wedge$ AGENT(e) = *mary* $\wedge$ THEME(e) = *john*]

(4.7) a. Mary out-stared John.



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

c. ⟦ExtArgP⟧: λe[*mary* $>^c$ *john* w.r.t STARE(e)]

Given the discussion in this dissertation, we can utilize *again*'s presupposition to test the predictions of the hypothesis that internal arguments should be severed from the verb/root in general and also in relation to *out*-PRED. Note first of all that if roots are simply predicates of events, then they should be available for *again* to attach, as I have argued for change-of-state verb roots. However, if verb roots do not have an internal argument in their semantics generally, we should predict that *again*'s presupposition also does not specify an internal argument when it attaches to roots. Empirically, this means we should expect that a prior context where there is an event of the same type but *containing a different internal argument* from the assertion should satisfy *again*'s presupposition. This is, however, not borne out; we see in the examples below that such contexts can never satisfy *again*'s repetitive presupposition, and only a prior event containing

the *same internal argument* can. I illustrate with the change-of-state verb *open* below, keeping the external argument identical across the context and assertion to demonstrate that the internal argument cannot be different across the two events.

(4.8) a. CONTEXT: Mary opened the window in her room. She left the room, and the wind blew the window closed. An hour later, Mary walked back into the room and opened the closed window so...
✓ Mary opened the window again

b. CONTEXT: Mary opened the window in her room. She left the room and the wind blew the window closed. An hour later, Mary walked back into the room and opened her always closed cabinet so...
Mary opened the cabinet again.

The problem is further compounded with *out*-PRED as it is also predicted that any event denoted by PRED should be able to satisfy *again*'s presupposition when it attaches to *out*-PRED, since PRED itself is of the correct type semantically for *again* to take as an argument. Again, this prediction is not borne out and only an *out*-PRED event can satisfy *again*'s presupposition; I illustrate here using the verb *stare* (examples (52) and (53) from Smith and Yu, 2020a).

(4.9) 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.

(4.10) 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.

In fact, in addition to requiring the internal argument be within its scope, the external argument of *out*-PRED must also be contained within *again*'s presupposition, such that the prior context satisfying it must always contain the same event participants. In other words, subjectless repetitive presuppositions are also not allowed with *out*-PRED. Any analysis of *out*-PRED must hence not produce any constituent for *again* to attach until all of its arguments have been introduced. I illustrate with the transitive activity verb *cook*, with (4.11) and (4.12) demonstrating the lack of a subjectless repetitive presupposition with *out-cook* (examples (58) and (60) from Smith and Yu, 2020a).

(4.11) 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.

(4.12) 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.

The range of presuppositions that *again* produces, which always include the verb's/root's internal argument, therefore suggests that severing the internal argument is neither the correct view generally nor correct for analyzing *out*-PRED. A different view of how verb roots associate with their arguments has been proposed in separate work in Smith and Yu (2020a), building on observations that the availability of subjectless repetitive presuppositions correlates with the presence of an internal argument with intransitive activity verbs that can be optionally transitive, such as verbs like *dance* and *sing*. The analysis is then extended to *out*-prefixation with an appropriate semantics for *out*-. Since it is clearly not within the scope of this concluding chapter, I will not attempt to outline the analysis here and instead refer the reader to Smith and Yu (2020a).

I move now to the final issue, the question of cross-linguistic implications of the observations and analyses presented here. A natural question is whether we should expect to find the same range of presuppositions observed here with the counterpart of *again* in different languages. As an illustration of the kinds of extensions possible, I discuss a particular example in Spanish. Cuervo (2003, 2014) argues extensively that some classes of unaccusative verbs in Spanish exhibit two different variants, indicated by the presence of a reflexive clitic *se*; some representative examples illustrated below (Cuervo, 2014, pp. 49).

(4.13) a. Cayeron tres hojas.
fell.PL three leaves
'Three leaves fell.' (*se*-less variant)

b. Se cayeron tres vasos.
SE fell.PL three glasses
'Three glasses fell (down).' (*se*-variant)

Cuervo (2014) observes that sub-lexical modifiers like *casi* 'almost' and *otra vez* 'again' illustrate that the *se*-variant and *se*-less variant actually differ in the number of sub-events present within the syntactic event structure, demonstrat-

ing with verbs like *salir(se)* 'come out/off' and *baja(se)* 'get down'. The key observation is that the *se*-less variant permits only one reading with these sub-lexical modifiers, while the *se*-variant permits two, indicating there are different attachment sites for the modifiers (Cuervo, 2014, pp. 54-55).

(4.14) a. Casi salen tres yuyos.
almost come-out three weeds
'There almost appeared three weeds.'

1. They almost emerged, but nothing actually did.

b. Casi **se salen** dos clavos.
almost SE come-off two nails

1. The nails almost started to come out but did not.
2. The nails did start to come out, but did not come off completely (no attainment of a final state).

(4.15) a. Bajaron otra vez los bonos hoy.
'Bonds dropped again today.'

1. Repetitive: The bonds dropped yesterday and they dropped again today.

b. Subimos al ominibus, pero **nos bajamos** otra vez.
'We got on the bus, but we got off again.'

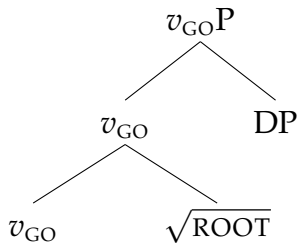
1. Repetitive: We got off the bus once, then we got on, and we got off again.
2. Restitutive: We were off the bus, we got on, and then we were off the bus again.

Cuervo (2014) therefore provides the following structures for the two variants as shown below. She assumes *se* is the spell-out of φ-features of the DP introduced by v_{BE}, morphologically realized as a clitic on v_{GO} (Cuervo, 2014, pp. 52).[3] The

[3]For our purposes, we may take v_{GO} to be equivalent to v_{BECOME}.

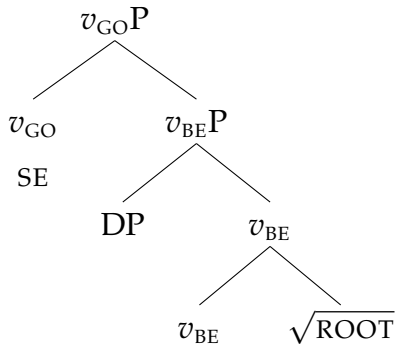
modifiers *almost* and *again* can scope over both v_{GO}P and v_{BE}P in the *se*-variant, but only over v_{GO}P in the *se*-less variant.

(4.16) *se*-less variant



Manner

(4.17) *se*-variant



State

The reader might have noticed that the structures she proposes for the two variants of unaccusatives are parallel to the difference I propose between the lexical causative and inchoative variants of change-of-state verbs in English. Hence, one cross-linguistic extension of the observations in chapter 3 would be to test if there is an ambiguity in the kinds of restitutive presuppositions produced with *otra vez* 'again' occurring with quantificational arguments with these verbs in Spanish, modulo the behavior of quantificational arguments and *otra vez* in the language. If these behave the same way as in English, then the presence of an ambiguity in restitutive presuppositions arising for one variant but not the other for these unaccusative verbs would further confirm Cuervo's (2014) analysis that the variants

have different event structures, differing in the number of v heads they contain.

There are, undoubtedly, countless other languages in which we can utilize sub-lexical modification, especially those that introduce presuppositional content at a sub-lexical level, to probe the inner workings of verbal argument structure once we have a full understanding of the distribution and precise semantics of these modifiers. They may, of course, show different results that may result from various sources. One may expect to find variation in how lexical semantic roots are organized into classes across different languages, different syntactic event structures, variation in where arguments are introduced for particular root classes, different semantics of the equivalents of *again* and other sub-lexical modifiers in different languages etc. These, of course, require detailed, language-specific investigation that I will leave for future inquiry.

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