HOW TO BEGIN?
TOWARD A GENERAL THEORY OF ASPECTUAL VERBS

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A DISSERTATION

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Linguistics—Doctor of Philosophy

2024

ABSTRACT

Aspectual verbs, like *begin, start, continue, finish,* and *end*, have been shown in recent literature to participate in several linguistic phenomena, resulting in a complex array of theoretical puzzles. The majority of semantic inquiry into these verbs revolves around their transitive constructions, focusing on the compositional relationship between the aspectual verb and its semantic complement. Many previous accounts, which rely on processes like complement coercion, type-shifting, and lexical metonymy to explain specific verbal behaviors, assume that aspectual verbs are type-specific in their semantic selection of complements, only ever taking an event argument. However, Piñango and Deo (2016) introduce the first of many behavioral complexities exhibited by these verbs in their novel observations of their varied stative (non-eventive) interpretations, reflecting their underlying mereological nature. Based on this, their account, the Structured Individual Hypothesis (SIH), in essence, dissolves the event/entity type distinction held by previous researchers and assumes instead a type-flexible account for aspectual verb semantic composition. However, while the mereological framework assumed in the SIH can be considered fundamental to aspectual verb semantics across complement types, the set of novel empirical evidence put forth in this dissertation shows that neither the SIH nor any current theory is sufficient for a comprehensive theory of all aspectual verb behaviors. As these theories limit their scope to primarily transitive aspectual verb structures, they miss generalizations evident when considering the varied argument structures these verbs may appear in (including *z began x, x began, x began with y,* and *z began x with y*). Specifically, the novel data of aspectual verb selective transitivity alternations presented here, which indicates their underlying (anti-)causative nature, crucially challenges the generality of the SIH, in particular, as it provides significant support for the event/entity type distinction in aspectual verb composition. The linking of prior (anti-)causation accounts to aspectual verb behavior aids in motivating a monadic approach to their semantic argument structure, which assumes they take in a single argument in their base form. Furthermore, previous accounts suffer from a lack of the fine-grained semantic formalism necessary to account for the varied telicity and meanings exhibited across these verbs. As such, this dissertation has five main goals: (1) to provide a comprehensive review of prior accounts,

(2) to examine the theoretical challenges to each in light of novel empirical data, (3) to link aspectual verb behavior to a monadic non-derivational non-lexical (anti-)causation account, (4) to investigate possible expansions of each prior account, and (5) to propose a set of theoretically well-motivated formal components that are argued to be necessary to incorporate in a comprehensive aspectual verb theory.

ACKNOWLEDGEMENTS

As I stand on the threshold of this significant milestone in my academic journey, it's with immense gratitude that I acknowledge the countless individuals who have supported me throughout the challenging but rewarding process of completing this dissertation.

I firstly want to thank my graduate advisor, Dr. Brian Buccola, for consistently lending his expertise, feedback, encouragement, and patience, which have played a pivotal role in shaping this work and my academic confidence more broadly. I hope to one day become a similarly great teacher and semanticist. I also extend my appreciation to my esteemed committee members, Dr. Suzanne Wagner, Dr. Karthik Durvasula, and Dr. Alan Beretta, for their invaluable contributions to this work and to my graduate career as a whole. Beyond being amazing sounding boards, Dr. Wagner and Dr. Durvasula have been pillars of encouragement in my professional development and have fueled my determination in future endeavors. In his time as my primary advisor, Dr. Beretta has shown unwavering enthusiasm in his advisee's projects, continually expressing his pride in our skills and accomplishments, which I could not be more thankful for. I must, of course, also express my deepest gratitude to my PhD cohort, Jason Smith, Dr. Naiyan Du, and Komeil Ahari, as well as my dear colleague, Dr. Ye Ma, for their inspirational perseverance, collaboration, and companionship throughout my time here.

To my dear friends, whom I will address directly, I doubt I will ever be able to express how important you have been to me on this journey as I hope I can be for you now and in the future. Victoria, your presence through every step of this process has truly been my anchor. Amidst the chaos, it has been your patience, devotion, and commitment to my well-being that has kept me grounded and I love you dearly for it. Darby, Sarah, and Mitch, your friendship has been invaluable to me over the years, and I will forever cherish the support and joy you have surrounded me with. Yongqing, your positivity and optimism have remained contagious throughout the years, and you have helped to lift my spirits during the toughest of times. And Ben, your gentle encouragement and quiet belief in me regardless of the challenges I've faced have helped me immensely in getting to this point in my academic career. You have become a source of strength and solace, and I am

profoundly grateful for our relationship.

To my family, your unending belief in my abilities has made this journey possible. You have helped me solidify my confidence with your encouragement throughout my life, which I have heavily relied on in the daunting hours of my time away from you.

Lastly, I cannot forget my three feline companions, Lemon, Pigeon, and Poppy, who have been constant sources of comfort. Their unconditional love and often not-so-quiet presence have been a needed grounding on even the most challenging days.

As I trek toward the conclusion of my PhD, I look fondly at the memories I've made along the way and consider them to be fundamental to the person I am today. Spanning back all the way to the beginning of this journey, I must finally thank the person who was the first to share with me his passion for linguistics and set me on this path, Dr. Greg Johnson, without whom I would never have come this far.

Thank you all for the immeasurable roles you have played in helping me reach this goal.

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CHAPTER 1

OVERVIEW

1.1 Introduction

Aspectual verbs, like *begin, start, continue, finish,* and *end*, have been shown in recent literature to participate in several linguistic phenomena, resulting in a complex array of theoretical puzzles. The majority of semantic inquiry into these verbs revolves around their transitive constructions (e.g. x began y). Certain constructions like *Lia began the book* (to mean *Lia began reading the book*), where no activity verb is given, yet one is still implicitly interpreted, have been of particular initial interest. This data prompted a Type-Shifting Hypothesis which assumes that aspectual verbs necessarily select for an event denoting complement argument and that any complement of a different type (e.g. entity denoting) must be coerced to conform to the verbs selectional restrictions (see McElree et al. 2001). This type-specific account is contrasted in Piñango and Deo (2016), who provide empirical evidence that aspectual verbs in these constructions may also denote non-dynamic, stative readings, as in *This sign begins the running trail*. They take this to motivate an account that highlights the underlying mereological meanings within aspectual verb semantics. Their Structured Individual Hypothesis (SIH) supports a type-flexible approach to aspectual verb predicate selection, dissolving the event/entity distinction between complement types. Mourounas and Williamson (2019) later attempt to adapt this same account to deal with variable predicate forms, namely when combining with definite and non-definite clauses.

Though the SIH generalizes to the multiple meanings exhibited by aspectual verbs, Piñango and Deo (2016), and other recent accounts, including Mourounas and Williamson (2019), do not consider their different argument structures and syntactic realizations, resulting in missed behavior generalizations. For instance, neither this account nor any previous account discusses the selective transitivity alternations that aspectual verbs may undergo (resulting in *x began*), shown here to be due to their underlying (anti-)causation. Further, no account addresses the possibility of a three-argument aspectual verb predicate structure (*z began x with y*), which introduces an additional meaning sense for this verb class. This novel data is shown throughout this dissertation to pose

significant theoretical challenges to existing accounts.

As such, this dissertation gives an extended argument against prior accounts for aspectual verbs, especially regarding the SIH, focusing primarily on three arguments concerning aspectual verb distributions and meanings: (1) transitive structures may denote causative meanings, (2) intransitive/anticausative uses are possible, and (3) the complements that show causative readings in the transitive are the ones which may undergo (anti-)causative alternations to appear in the intransitive, restricted to only event denoting arguments. This overall empirical paradigm for aspectual verb behaviors is exemplified in the following examples, which will be referred to and reiterated throughout this discussion.

(1)   Lia began the fight $\Rightarrow$ *Lia caused the fight to begin*

    a. The fight began

    b. The fight begins with Lia

(2)   Lia began the book $\not\Rightarrow$ *Lia caused the book to begin*

    a. *The book began

    b. The book begins with Lia

Investigating the complex semantic selection exhibited in the bare intransitive (1a, 2a), along with the theoretical critiques put forth here, ultimately points to a proposal that reconsiders the adoption of a type-specific account, rooted in the event/entity complement type distinction. Furthermore, the linking of prior (anti-)causation accounts to aspectual verb behavior aids in motivating a monadic approach to aspectual verb semantic argument structure, which assumes they take in a single argument in their base form. As such, prior accounts by Hovav and Levin (2012) and Hovav (2014) are taken as joint motivation for a non-lexical derivation between such (anti-)causative transitivity alternations.[1] This provides additional aspects to an underlying theoretical framework for future accounts.

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[1]Further clarifications and motivations for this non-lexical account are provided in Chapter 3.

As no current semantic account for aspectual verbs can (at this point) predict the behaviors discussed, a set of possible theoretical expansions of these previous approaches are investigated here and ultimately refuted. This set of novel empirical evidence coupled with the theoretical analyses considered here ultimately contributes to my argument that no current aspectual verb theory, nor intuitive adaptations of them, is sufficient to account for the complex compositional behavior these verbs show. As such, this dissertation has five main goals: (1) to provide a comprehensive review of prior accounts, (2) to examine the theoretical challenges to each in light of novel empirical data, (3) to link aspectual verb behavior to a monadic non-derivational non-lexical (anti-)causation account, (4) to investigate possible expansions of each prior account, and (5) to outline a set of theoretically well-motivated formal components that are argued to be necessary to incorporate in a comprehensive aspectual verb theory.

The structure of this dissertation is as follows: The remainder of this chapter discusses relevant concepts integral to the analyses reviewed in later chapters; Chapter 2 reviews the theoretical and empirical landscape provided by primary aspectual verb theories, focusing on Type-Shifting accounts and the SIH along with their respective theoretical critiques; Chapter 3 introduces the novel evidence of aspectual verb (anti-)causative alternations as well as other complex constructions and discusses the empirical challenges posed by these varieties to prior accounts; Chapter 4 investigates and debunks a possible theory-preserving avenue for the SIH, further motivating a monadic approach to aspectual verb semantics; Chapter 5 tests other intuitive adaptations of previous theories in order to account for the reviewed variable behaviors, which are shown to likewise be insufficient; Chapter 6 provides a synthesized proposal of foundational theoretical claims based on the evidence and critiques reviewed throughout; and lastly, Chapter 7 includes a final discussion and concludes the dissertation.

1.2 Relevant Concepts

Before delving into the complex linguistic nature of aspectual verbs, it is first useful to review some crucial theoretical concepts and terms that will be used throughout the following discussion. Presented here is such a review, first considering the nature of the eventualities these verbs describe,

followed by a review of mereological (part-whole) relations, which they have been shown to express.

1.2.1 Eventualities and Lexical Aspect

A crucial part of studying aspectual verb behavior is understanding the nature of the events they describe. Within semantic theories, verbs are thought to internally make reference to some kind of *eventuality* (using Bach's (1981) term), often represented within the verbs' denotation, so that the meaning of the verb is directly tied to the shape of the eventuality it expresses (Davidson 1967). Different verbs are considered to make reference to different kinds of eventualities, traditionally categorized by Vendler (1967)[2] across four classes: states, activities, achievements, and accomplishments, defined and exemplified below.

- State: an event which contains no internal structure or change, without an implicit endpoint

  e.g. *Lia **loves** Mary*, *The book **is** pretty good*, *Mary **thinks** shes nice*

- Activity: an ongoing event with internal change, but no implicit temporal endpoint

  e.g *Lia **walked** along the path*, *Mary **painted** happily*, *She **spoke** to her mom*

- Accomplishment: an ongoing event with internal change and an obligatory implicit temporal endpoint

  e.g. *Mary **ate the apple***, *Lia **sang the song***, *They **told her a story***

- Achievement: an event with no internal structure or duration, but may denote change, with an implicit endpoint

  e.g. *Lia **arrived** home*, *Mary **reached** the summit*, *I **recognized** her*

These definitions revolve around the verbs' *lexical aspect* (or 'aktionsart'), which deals with the internal temporal structure of the verbal eventuality, i.e. how that event extends over time. Importantly, this is distinct from *grammatical aspect*, which relates an event or subevent to some reference time in the grammar via tense morphemes. The lexical aspectual properties of verbal

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[2]Though many varying classification systems like Vendler's have been proposed, for the sake of this review, his system is used as it is the most heavily adopted within the field. However, an adapted account given by Piñón (1997) will be reviewed and considered in Chapter 2

events are characterized and distinguished in terms of *dynamicity* - whether an event denotes some internal change of state - and *telicity* - whether the event has an implicit endpoint (Jackendoff 1991). A reliable diagnostic for a predicates internal telicity is whether it may combine with an adverbial phrase headed by either the prepositions *for* or *in*. For example, the atelic phrase *walked* in (3) is compatible with a *for*-phrase, expressing duration of an event, but is not compatible with an *in*-phrase, as it does not express any end-point of the event. Conversely, the telic predicate *ate an apple* in (4) is compatible with an *in*-phrase but not with a *for*-phrase.

(3) Lia **walked** (*in ten minutes / *for* ten minutes)

(4) Mary **ate** an apple (*in* ten minutes / *for ten minutes)

This telicity test further indicates that the meaning of a verbal eventuality is dependent not only on the verb itself but on the predicate clause as a whole; factors like adverbial modification and the nature of the thematic participants in the composition interact with the interpreted aspectual properties of the verb.

Similar to other semantic arguments in our ontology, events are considered to be 'objects' in the same sense as truth values, ordinary entities, possible worlds, degrees, etc., and thus may be input into linguistic compositions in a similar functional way. These verbal eventualities encode specified relations between sentential participants, assigning them *thematic roles*, e.g. an agent (sentient actor of the event), theme (argument undergoing/affected by the event), cause (the causer of the event), goal (the target of the event), etc. Within Neo-Davidsonian semantics, these thematic roles are part of the event structure and serve to further define the predicate meaning (Parsons 1990).

For the most part, while verbs may often shift in grammatical aspect (tense shifts), it is thought that only in certain structural cases may a verb undergo a change in its lexical aspect (Thompson 2006). Though, as will be shown, in both transitive and complex intransitive constructions, aspectual verbs may appear with multiple aspectual meanings, denoting either a bounded telic achievement, an unbounded atelic state, or an ambiguity between them, depending on the interpre-

tation of the eventuality participants. This phenomenon will be examined further in section 2.3 and throughout.

1.2.2 Mereological Semantics

In mereological semantics, certain objects can be conceptualized as being made up of parts; pages are parts of a book, individuals are part of a group, etc. and language is sensitive to these different kinds of part structures. Moltmann (1997) understands such entities as *integrated wholes* - distinct spatiotemporal entities that are made up of related parts, which may themselves reflect integrated wholes.

The parts of an object form a specified *part structure*, which can be interpreted across different conceptual dimensions, including time, space, individuals, etc. For example, a *concert* event can be understood as reflecting an interval of time along a temporal dimension, made up of sub-interval performances. Similarly, a *book* can be understood as reflecting an object in space along a spatial dimension, made up of smaller objects (chapters) in space.

However, the part structure of an integrated whole can vary in two ways; (i) a singular entity/event may have different sets of parts in different pragmatic/situational contexts, and (ii) a singular entity/event can have different sets of parts along different dimensions. For example, a book may be segmented by pages or by chapters depending on context, and may similarly have a differently structured order depending on the point of reference. Further, a concert may be interpretable as an extended eventuality segmented based on either songs or performers.

Krifka (1998) assumes that all ontological dimensions – time, space, eventualities, and entities – are characterizable by the same underlying mereological algebraic structure and thus can be considered within the same mereological framework. This perspective is followed by Piñango and Deo (2016), who motivate an account which interprets aspectual verbs as denoting mereological part relations between their thematic participants, and further instantiates a presupposition on the verb which invokes selectional restrictions involving the part structure of the complement argument. This will be discussed further in the following chapters.

With this review of fundamental concepts, we may now turn to the current theoretical and

empirical landscape regarding the complexities associated with aspectual verb behaviors. The fundamental accounts given by type-shifting literature and Piñango and Deo (2016) are individually investigated and assessed in terms of theoretical strength and generality.

CHAPTER 2

EMPIRICAL AND THEORETICAL LANDSCAPE

2.1 Introduction

This chapter focuses on two linguistic behaviors aspectual verbs take part in that have been the primary areas of focus in recent literature; namely, their 'complement coercion' constructions and their multiple mereological meanings. Following a description of each behavioral phenomenon is an outline of the prominent theories applied to account for them; the Type-Shifting Hypothesis (see Pustejovsky and Bouillon 1995) and the Structured Individual Hypothesis (Piñango and Deo 2016), respectively. As will be shown, while the former theory may effectively capture the complement coercion (henceforth, CC) construction data, it alone cannot capture the multiple mereological senses of the verb outlined in Piñango and Deo (2016). While the presented data empirically challenges the generality of the Type-Shifting Hypothesis, the Structured Individual Hypothesis is similarly critiqued on several theoretical bases, as discussed in 2.3.3. In what follows, each phenomenon and their respective theories are discussed, along with their competing theoretical implications for aspectual verbs broadly.

2.2 Complement Coercion Constructions

2.2.1 The Phenomenon

One of the possible meanings that aspectual verbs like *begin, end, continue*, etc. may have is one that is eventive, specifically denoting the temporal 'edges' of some durative event it combines with, expressing the aspectual point at which it begins, continues, or concludes. This meaning sense has been extensively researched, prompting the theoretical perspective that aspectual verbs have a singular lexical entry which takes in some durative event argument to modify (Freed 2012; Pustejovsky 1991). In transitive aspectual verb constructions, this event argument may be provided explicitly by an embedded activity verb, e.g. *packing* in *I began packing my suitcase* or *running* in *She finished running the marathon*. Consider now a similarly well-researched[1] semantic behavior

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[1]See Baggio et al. 2010; Brennan and Pylkkänen 2010; Frisson and McElree 2008; Frisson and Pickering 2001; Jackendoff 1997; Katsika et al. 2012; Kuperberg et al. 2010; McElree et al. 2001; Pickering and Frisson 2001; Pickering et al. 2006; Piñango et al. 2006; Pustejovsky 1991; Pustejovsky and Bouillon 1995; Traxler et al. 2005

of aspectual verbs exemplified below in (5), where *no* event or activity is explicitly provided in the semantic structure, yet one is still implicitly (understood, but unexpressed) interpreted. This is compared to the example in (6) where the event/activity is denoted explicitly in the composition from the event nominal complement.

(5)   The author began/finished/continued the book.   *reading/writing*

(6)   The boxer began/finished/continued the fight.

The resulting interpretation in (5) has an implicit predicate phrase of *reading/writing*, that incorporates the complement, *the book*, as its direct object. However, the default nominal interpretation of *the book* is not of an activity or an event, but of an entity. As such, under a theory which assumes aspectual verbs take in only an event denoting complement, it is unclear what processes underlie this apparent event extrapolation from a default entity denoting complement. Compare this sentence to the one in (6), where the lexical meaning of the complement, *the fight*, as an event nominal, naturally denotes an event argument (Borer 2003; Grimshaw 1990). In this sentence, the resulting compositional eventive meaning comes about straightforwardly given the default event interpretation of the complement. The phenomenon demonstrated in sentences like (5) initially prompted researchers (Jackendoff 1997; Pustejovsky 1991; Pustejovsky and Bouillon 1995) to motivate an argument for a necessary *enriched* form of semantic composition in these specific CC constructions. This process involves the default interpretations of semantic elements in the sentence being modified in order to adhere to the aspectual verb's hypothesized semantic restrictions, as examined below.

2.2.2   Type-Shifting Hypothesis

Pustejovsky and Bouillon (1995) first applied the idea of *enriched semantic composition* to account for the process of apparent event extrapolation in these aspectual verb constructions. To review, a process of semantic enrichment introduces semantic structure that is not explicitly represented in the surface form (Jackendoff 1997; Pustejovsky 1991; Pustejovsky and Bouillon 1995). In other words, additional meaning is extrapolated implicitly from the conceptual structure

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that is not present in the lexical surface structure (e.g. the implicit event in (5)). In the case of these aspectual verb constructions, this enrichment has been implemented in terms of a *coercion* process (Partee and Rooth 1983; Partee 1990), wherein there exists a coercion trigger and some object that is coerced via a coercion operator in the composition. The fundamental trigger of coercion is a mismatch between the selectional properties of a 'selector' in the semantic composition and the semantic properties of the 'selected' element, with the presupposition that any element that has selectional restrictions, like aspectual verbs are assumed to have, has the potential to impose a coercion trigger (Lauwers and Willems 2011).[2]

In the case of sentences like (5), the aspectual verb is considered to be the selector while the complement is the selected element, following typical semantic function application. As stated, on this view of aspectual verbs, their default semantic selection is restricted to an event denoting argument, as in (6). This assumption is rooted firstly in the assumption that they denote a singular lexical entry (as opposed to distinct entries for distinct compositional verbal restrictions), and secondly on the fact that in transitive structures, these verbs often take event denoting verbal arguments, as in *Lia began snoring*, where the verbal expression is eventive. Indeed, a preference towards the eventive reading as the default interpretation of these verbs is further supported in the Acceptability Judgment task reviewed in Chapter 3.

Thus, when aspectual verbs combine with an entity denoting complement, there is a mismatch between the verb's hypothesized selectional restrictions and the entity denotation of the complement, acting as a trigger for a coercion process. Specifically, Pustejovsky and Bouillon (1995) argue that the complement undergoes an operation in which its semantic type is coerced from an entity to an event, hence the nomenclature of *complement coercion* (CC) to describe such phenomena. This coercion is thought to result in the repair of the mismatch between the verb's selectional restrictions and the complement's lexical properties, resulting in the implementation of additional semantic structure to restore meaning.

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[2]As recognized in Lauwers and Willems (2011), these processes fall along the same conceptual lines as other theorized notions of recovery such as pragmatic *accommodation* (Goldberg 1995), which seem to require similarly theoretically slippery operations.

To explain the process by which an event is extrapolated in these CC constructions, Pustejovsky and Bouillon (1995) rely on the lexical representation of the entity denoting complement, specifically claiming that the *qualia* structure it expresses includes telic and agentive properties that are accessible in the composition. The qualia structure of a lexical item accounts for a wide variety of linguistic features intrinsic to the lexical item, specifying its acceptable forms of composition and interpretation including any argument selection, adjectival modification, and type coercion (Pustejovsky (1991) and Pustejovsky and Bouillon (1995)). In the case of these complement types, the telic properties extrapolated from their qualia structures describe the function/purpose of the complement while the agentive properties describe how it comes to be (Pustejovsky and Bouillon 1995). Consider *the book*; the qualia function of it is *to be read*, so, on this account, the implicit activity verb in the telic structure is extrapolated as *read*. It also comes to be by the activity of writing, hence the implicit verb in the agentive structure is extrapolated as *write*. In such cases, the aspectual verb may access either metonymic meaning of the complement. In this sense, the coercive type-shifting process in CC constructions is dependent on the qualia structure of the entity complement of the verb, namely whether it may achieve a telic eventive interpretation.

Another verb class that has been shown to exhibit similar behavior patterns and as such has been considered alongside aspectual verbs are *psychological* (henceforth, *psych*) verbs like *enjoy, prefer, tolerate, resist, endure, savor*, etc. The verbs in this class also seem to participate in transitive CC constructions, where no embedded activity verb is expressed, but one is implicitly interpreted, as exemplified in (7) and (8) (Katsika et al. 2012).

(7) Mary tried the ice cream.   *tasting/eating*

(8) Lia enjoyed the book.   *reading/writing*

Though the class of CC verbs had initially been considered to include both aspectual and psych verbs, Katsika et al. (2012) distinguish the typical CC operation and the one apparent in the psych verb examples above by appealing to the verbs' differing argument structures. They argue that, in contrast to aspectual verbs, the external argument of psych verbs is that of a subject experiencer,

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with their complement "entailed to be either a target of emotion or subject matter of emotion," adopted from Pesetsky (1996). Given that the subject of emotion may manifest as either an entity (as above), event (e.g. *tolerate the performance*), or state-of-affairs (e.g. situations, processes), they claim that while psych verbs *may* take an event denoting complement, this is not necessarily encoded as a semantic selectional restriction as is thought to be the case for aspectual verbs. Rather, they attribute the operation of apparent event extrapolation in psych verb constructions not to a coercion of the complement from one type to another, but to a pragmatic inference process necessary to infer a relevant activity of targeting the subject-experiencer's emotion to the complement.[3]

It is these behavioral facts that have prompted much of the early experimental research on aspectual verbs. Indeed, this data has been argued to persist cross-linguistically, analyzed in (American) English, Mandarin (Hsu and Hsieh 2013; Ma et al. 2022; Song 2014; Xue and Liu 2021; Zuo-ya 2011), German (Zarcone et al. 2017, 2015), and Icelandic (Jalbert et al. 2020).

Given that this coercive Type-Shifting Hypothesis necessarily assumes aspectual verbs to be selective in the semantic type they take in, specifically restricted to events, this framework considers them to be *type-specific*. The competing framework promoted in Piñango and Deo (2016), to be discussed in 2.3.2, though also assuming a singular lexical entry for aspectual verbs, argues against a type-specific perspective on two counts: Firstly, they demonstrate stative (non-eventive) data showing that aspectual verbs can in fact take in entity complements that retain their entity readings. Secondly, and more relevant to the discussion presented here, they assume a *type-flexible* account for aspectual verb complement selection, treating both entity and event complement types the same compositionally and conflating their distinction in terms of aspectual verb selectional restrictions. This theoretical difference is further highlighted and challenged by the novel empirical data of intransitive aspectual verb constructions to be analyzed in Chapter 3.

Barring the complexities and issues with over-generalization in the Type-Shifting Hypothesis, it provides a well-adopted theoretical perspective in accounting for transitive eventive aspectual verb

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[3]Importantly, psych verbs have been shown to have differences in online processing costs when compared to aspectual verbs (Katsika et al. (2012)), further suggesting that a distinct and potentially more complex theoretical approach is necessary for either class.

sentences like (5). However, as will hopefully be evident from the work presented here, this account must be contextualized and assessed within the entire breadth of aspectual verb behaviors. Type-shifting Hypotheses hold an underlying claim that aspectual verbs are restricted only to eventive interpretations; an account which, given the observations made in Piñango and Deo (2016) of stative interpretations, will be shown to be relatively too narrow. We turn now to a review of this mereological account.

2.3 Structured Individual Arguments

2.3.1 The Phenomenon

Another semantic behavior of aspectual verbs to address stems from the relatively recent observation in Piñango and Deo (2016) that they may not only be interpreted as expressing a telic achievement eventuality, as in CC constructions, but may also have generic stative readings where the verb instead denotes an unbounded atelic state eventuality. Thus, prior theoretical accounts for these verbs which rely only on their eventive/agentive readings, as in Type-Shifting Hypotheses, unintentionally miss the generalizations necessary to capture this data. Shown below are possible stative sentences including aspectual verbs *begin, continue,* and *end.*[4]

(9)   The porcelain doll begins/continues/ends the row of toys.

(10)   This little sign begins/continues/ends the hiking trail.

(11)   The chapter on poverty begins/continues/ends the book.

(12)   A piece by Vivaldi begins/continues/ends the concert.

In each of these examples, the eventuality being expressed is stative, containing no internal change or specified duration. These stative constructions highlight a multitude of mereological part-whole relations that aspectual verbs may denote. In eventive constructions (e.g. *Mary began climbing the mountain*), the aspectual verb is thought to denote an instantaneous *sub-event* (a beginning event) that is located adjacent to the boundaries of a whole durative event (a climbing event), where Mary is the agent (to be discussed further in 2.3.3.1). In contrast, the part-whole

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[4]For ease, the aspectual verbs in these sentences are given in present tense, which has been shown to pattern more with stative readings in English.

relations exhibited in (9)-(12) relate the structure of aspectual verbs' thematic participants to one another, namely between the subject *part* and the complement *whole*. In the cases of the complements in (9)-(11), their entity meanings are preserved, where the verbal predicate similarly indicates some sub-part at the boundaries of the entity whole. Due to this, Piñango and Deo (2016) refer to such stative readings as *constitutive*, where a sub-part *constitutes* a part of the whole. For example, in (9), the subject *the porcelain doll* is understood as the initial/medial/final itemized part of *the row of toys*. Similarly, in (10), *this little sign* is a part of *the hiking trail* that serves to mark its external and internal spatial boundaries. In (11), *the chapter on poverty* can be interpreted as a specific portion of information represented as an initial/medial/final informational part of *the book*.[5]

Finally, in (12), *a piece by Vivaldi* denotes a temporal interval at the initial/medial/final boundary of the durative event denoted by *the concert*, similar to the meanings in CC constructions, though, crucially this predicate denotes a state. Moreover, examples (9), (10), and (11) contain entity denoting verbal complements, whereas (12) contains an event denoting complement. As such, the sentences in (9), (10), and (11) each construct the part structure of the complement along some non-temporal semantic dimension, whereas (12) represents it along a temporal dimension, reflecting that these aspectual verbs may describe part relations between participants across multiple mereological domains (i.e. space and time). This observation relates to the multiple meanings that Piñango and Deo (2016) argue aspectual verbs are able to access given more general selectional requirements.

Furthermore, in line with the dependencies on the complement's qualia structure in CC constructions, the specific interpreted part structure of the complement is dependent on the interpretations of both the complement and the subject, given that different parts may make up their whole entities/events in variable ways (see Frazier and Rayner (1990)). Consider again the sentences in (5b), *The author began the book* and *The boxer began the fight.* In this case, the complement (*book/fight*),

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[5]These constitutive transitive constructions may be considered to be marginally questionable to some readers due to the salience of the eventive verbal interpretation of aspectual verbs. However, experimental evidence presented in the latter half of Chapter 3 provides support for their availability among native American English speakers.

seemingly regardless of its default type, may be construed either with an eventive agentive reading, i.e. as the theme of a predicate of events, *or* with a stative mereological interpretation, i.e. as a whole object made up of parts denoted by the subject. The eventive reading is notably more salient; so salient, in fact, that some readers may find it difficult to access the constitutive reading. Conversely, with a sentence like (11), the availability is reversed, given that chapters aren't the kinds of things to agentively read/write books.

Consider (5), *The author began/finished/continued the book*; in the eventive agentive reading in the CC construction, the subject (*the author*) is interpreted as the agent of a sub-event part extrapolated from the complement theme (*book*), where the aspectual predicate denotes a telic achievement. However, in the stative reading of (5), *the author* is instead understood as a sub-part of the informational whole that is represented by *the book*, e.g. an author's note to the reader. The same variability in meaning can be observed in (6), *The boxer began/finished/continued the fight*; consider another reading where *the boxer* is understood not as the agent of a fighting event, but e.g. as the first fighter in a lineup of fights for that night. On this meaning, the complement *fight* is interpreted as a temporal structure ordered by individualized fighters. Thus, it can be said that the fight began with the boxer as the first fighter in an event consisting of many other fights, resulting in a stative reading where *the boxer* is understood as representing the initial/medial/final part of the temporal whole that is represented by *the fight*.[6]

This data shows that both the availability of mereological stative meanings in these transitive constructions and the exact interpretation of the part-whole relation mapped between the subject and complement are contextually dependent on the semantic denotation of both thematic participants, which manifest either as a thematic agent of a subevent or as a subpart of a whole. These observations from Piñango and Deo (2016) show that in certain structures, aspectual verb predicates have an ambiguity in their event structure, stemming from differences in the interpretations of their thematic participants along with how the verb relates them to one another. This ambiguity is analyzed further by the account given in Piñango and Deo (2016), which contextualizes prior aspectual verb accounts

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[6]This *began with...* structure, shown to paraphrase the stative transitive, will be discussed in more detail in section 2.4.3.

within these stative mereological behaviors.

Also gleaned from this data is how it challenges prior type-specific accounts on aspectual verb behavior like the Type-Shifting Hypothesis, which necessarily assumes aspectual verbs in such transitive constructions are restricted to an event denoting complement argument. The apparent mereological meanings present in (9)-(12), along with the variable meanings accessed in (5b), reflect part-whole relations across a range of dimensions, regardless of the default type of the complement; both entity and event denoting complements may be input into the predicate composition. While this poses a challenge for a type-specific stance (and further calls to question the generality of the Type-Shifting Hypothesis), Piñango and Deo (2016) explain such data by assuming a *type-flexible* account for aspectual verb composition, as discussed below.

2.3.2 Structured Individual Hypothesis

Based on these phenomena, Piñango and Deo (2016) proposed the *Structured Individual Hypothesis* (SIH), which applies a multi-dimensional mereological semantics to aspectual verb denotations, crucially incorporating their part-whole makeups within the mereological framework in Krifka (1998). This account approaches the underlying aspectual predicate structure more generally, adopting Krifka's idea of a **generalized axis** argument in defining the lexical semantics and selectional restrictions of verbal predicates. An axis is defined as a linearly ordered set of conceptual entities in any ontological domain (time, spatial paths, events, and objects) - in this way, the conceptual structure of the verbal predicate can generalize across multiple dimensions (Deo et al. 2013; Gawron 2009). These axes reflect a specified part structure of some entity/event along an ontological domain.

Piñango and Deo (2016) adopt a subclass of Krifka's axioms of such axes, a *one-dimensional **directed path structure*** (DPS), as most relevant to aspectual verb composition. Such one-dimensional DPSs are defined as follows, where for each two convex, non-overlapping parts x and y within a domain, it holds that either x precedes y or y precedes x.

(13) $\forall\, x,y \in D[\neg\, x \otimes y \rightarrow x \leq y \vee y \leq x]$

This results in a convex linear structure whose adjacent parts (x, y) are totally ordered by the

precedence relation (≤), which may be interpretable across multiple contextually derived domains. As Piñango and Deo (2016) put it, this structure reflects a conceptual 'line' which connects the edges of a one-dimensional DPS. For example, this may be conceptualized as a temporal precedence between subevents in a sum event, e.g. a concert event linearly structured by separate performances, which constructs a one-dimensional path along a temporal dimension. This can also be conceptualized as a spatial 'line', e.g. the connection between the U.S. cities of Lansing and New Orleans comprised of spatial subparts ordered by precedence, dependent on the point of reference (from Lansing vs. from New Orleans), constructing a one-dimensional path along a spatial dimension. Krifka (1998) provides the example of a book as a DPS, whose adjacent ordered subparts may be conceptualized as chapters or even pages. In this sense, the precedence relation orders such DPSs relative to their respective informational or spatial subparts. Similarly, a line of people constitutes a one-dimensional DPS, linearly ordered by individuals depending on the point of reference (whoever 'begins' the line to whoever 'ends' it). Piñango and Deo (2016) conceptualize the ontological domains along which axes may fall, namely the temporal, spatial, eventive, and individual domains, as one-dimensional DPSs in their own right and follow that connections exist between them via homomorphic partial functions that map objects from one domain to objects in another. A homomorphism is a structure-preserving functional mapping, i.e. a function from a structure A to a structure B that preserves the structures of both A and B. This set of functions include typical thematic role functions which map individuals to events along with temporal and spatial trace functions which map individuals and events to their respective temporal or spatial point. Most relevant to aspectual verb composition are those functions that map entities to one-dimensional DPSs. On this account, aspectual verbs serve to constrain the relations between these ontological domains.

Such one-dimensional DPS axes (henceforth, *axes*, for simplicity) and the entities that relate to such axes via homomorphic functions are called *structured individuals* by Piñango and Deo (2016). The SIH claims that aspectual verbs impose selectional restrictions in that they select a structured individual (SI) as their complement, define in (14), explained in (15), and some entity that may be

mapped onto it as their subject.

(14) $\forall x_\tau [\ \textbf{struct-ind}_{f_{\langle\tau,\sigma\rangle}}(x) \leftrightarrow [\textbf{axis}(f(x)) \wedge \forall y, z \le x\ [y \le z \to f(y) \le f(z)]]]$

(15)   An individual x of any type τ is taken to be a structured individual relative to a function f of any type (τ, σ) iff $f(x)$ is an axis and f is a homomorphism from the part structure of x to the axis $f(x)$

<div align="right">adapted from Piñango and Deo (2016)</div>

The makeup of this axis is contextually dependent on the SI complement's denotation and qualia structure. In order to achieve the multiple interpretations apparent in transitive aspectual verb sentences, Piñango and Deo (2016) assume that the axis of the aspectual verb complement falls along an appropriate dimension lexically encoded on the aspectual verb. The mechanisms of this are summarized below.

Aspectual verbs are said to select for a general SI argument based on a lexically encoded presupposition. If satisfied, the SIH claims that a homomorphic function is applied to the SI complement in order to map it to possible dimensions for the axis to be interpreted along. Thus, the generalized lexical denotation for *begin* under this framework is given in (16) and explained in (16b).

(16)   a. $[[begin]] = \lambda x_\tau\ \lambda y_\sigma : \textbf{struct-ind}_{f_c}(x).\ \exists f'[f'(y) <_{small\text{-}init} f_c(x)]$

      b. *Begin(x)(y)* is defined iff x is a structured individual with respect to the contextually determined function f_c. If defined, *begin(x)(y)* is true iff there is some function f' (possibly identical to f) such that $f'(y)$ is a "small" initial subpart of the axis $f_c(x)$.

<div align="right">Piñango and Deo (2016)</div>

Based on this hypothesis, aspectual verbs select two arguments, an general SI complement x and an external argument y that may be mapped onto some 'privileged small-initial/medial/final' subpart of that SI, interpreted along some salient dimension.[7] Their denotations for the aspectual verbs *continue* and *end* are also provided below, with similar denotations to *begin*.

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    [7]For a more in-depth commentary on this process, see Piñango and Deo (2016).

(17) $[[continue]] = \lambda x_\tau \, \lambda y_\sigma : \textbf{struct-ind}_{f_c}(x).\exists f'[f'(y)<_{small\text{-}medial} f_c(x)]$

(18) $[[end]] = \lambda x_\tau \, \lambda y_\sigma : \textbf{struct-ind}_{f_c}(x).\exists f'[f'(y)<_{small\text{-}final} f_c(x)]$

Piñango and Deo (2016)

With these denotations and mechanisms, this account can very simply deal with the stative constitutive readings apparent in (9)-(12). Piñango and Deo (2016) consider the subjects of these examples to be associated with an initial/medial/final subpart of the ordered whole denoted by the complement. Following their approach and terminology, these example sentences demonstrate the various theorized dimensions that the complement object may be interpreted along. As both event-type and entity-type individuals are interpreted as mereological structures, the complements in these sentences, though distinct types, are treated similarly within the compositional semantics presented in Piñango and Deo (2016).

To demonstrate this, for example, in (9), *the row of toys* may be understood as made up of atomized individuals with *the porcelain doll* constituting the first/medial/final of those, where the complement is interpreted along an *atomized individual* dimension. Likewise, in (10), *the hiking trail* can be visualized along a spatial plane, thus falling along the *spatial* dimension where *this little sign* constitutes the initial/medial/final part of that plane. In (11), *the chapter on poverty* can be interpreted as constituting the initial/medial/final section of informational content within *the book*, where the complement falls along an *informational* dimension. In (12) *the concert* may be construed as a string of temporal intervals such that *a piece by Vivaldi* constitutes the initial/medial/final interval, thus the complement is interpreted along a *temporal* dimension.[8] For the sake of the discussion throughout, I follow these dimension intuitions. Piñango and Deo (2016) differentiate these constitutive readings from the *agentive* reading of eventive CC constructions, discussed further below.

In accounting for CC constructions, Piñango and Deo (2016) note a further observation about the

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[8]Note that there may be many other interpretable dimensions that aspectual verb complements can fall along which may not be as easily perceivable or salient. However, these are the few dimensions explicitly introduced in Piñango and Deo (2016), and the aim to discover or outline more is not necessary for the purpose of this dissertation, though warrants inquiry.

ways in which the lexical semantics of aspectual verbs is thought to be able to constrain the relations between ontological domains, specifically considering their *incremental theme* interpretations. Incremental theme verbs are thought to relate parts of their object denotation and parts of an event to each other in a one-to-one homomorphic mapping (Krifka 1998). This can be seen in typical consumption/creation verbs like *eat, drink, build* in which the extent of the event is tied to the extent of the complement, e.g. the temporal length of a *wine drinking* event is directly dependent on the amount of wine drunk. In the same way, an extrapolated *book reading* event is tied to the extent to which the book has been read. Krifka (1998) proposes a series of homomorphic θ-relations that relate events and incremental themes such that constraints on the mereological properties of one are reflected on the other in a way that preserves quantity and edges (see also Beavers (2008)). Piñango and Deo (2016) consider CC constructions with aspectual verbs to describe incremental relations that hold between a contextually provided complement axis and the participants of the sum eventuality extrapolated from the verb. Plainly, the incremental reading is only available if the dimensional interpretation of the aspectual verbal complement is eventive. They further claim that, on an eventive reading, a sentence like *Mary began the book* in fact cannot make reference to any event in which *the book* is not considered an incremental theme, e.g. playing with or seeing the book. They assume that the SI presupposition theorized to be encoded in the lexical semantics of aspectual verbs constrains all possible extrapolated eventualities to those that express incremental relations due to the necessary homomorphic relation of an axis. It is this incremental reading that they consider as further delineation between aspectual verbs and psych verbs, where the latter do not have such restrictions regarding the meaning relations between their complement and the respective predicate.

The agentive readings in CC constructions pose a further puzzle for this mereological perspective given that the subject must be interpreted not as a subpart, as in constitutive readings, but as the agent of a 'privileged' sub-event accessed by the aspectual predicate. To formalize the mapping between the complement axis, subject, and some contextually derived eventuality, Piñango and Deo (2016) rely on what they call *inverse thematic functions*, which "map pairs of individuals and times

to the unique event that the individual bears a participant role to at that time in a given context." These are stipulated as distinct functions from typical thematic role functions, whose mapping is reversed. To demonstrate, in *The author began the book*, with the activity verb unexpressed, the agentive reading is defined if there exists some function f_{theme} which maps *the book* to an (incremental) event, and if there exists some function f_{agent} which maps *the author* to the agent of a subevent of that event. Piñango and Deo (2016) define this in (19). In this example, *the author* is said to be interpreted as the agent of the 'small-initial' part of the event associated with *the book* theme, i.e. the reading/writing of the book.

(19) a. *The author began the book* is defined if

$$\text{axis}(f_{theme_i}(\text{book})) \wedge \forall x', x'' \le b \ [x' \le x'' \rightarrow f_{agent_i}(x') \le f_{theme_i}(x'')]$$

b. If defined (19a) = 1 iff $\exists f'[f'(\text{author}) <_{small\text{-}initial} f_{theme_i}(\text{book})]$

Piñango and Deo (2016)

Thus, Piñango and Deo (2016) consider this mereological account, which is based on dimensional functions accessed by a single generalized verbal denotation, to be able to easily deal with the ambiguity between agentive (eventive) and stative (constitutive) readings noted in CC constructions. On the eventive reading of *The author began the book*, this account says that the structure of the complement is related to some salient event via inverse thematic functions, where its axis falls along an eventive dimension. On the constitutive reading, where the complement is understood as a structured set of informational subparts, it says that the subject is mapped by the verb to some privileged subpart. In this case, the complement axis falls along an informational dimension. Though, as will be shown in the following section, these inverse thematic functions can be critiqued on a few accounts.

As the SIH is the first generalized theory of aspectual verbs to account for their mereological meanings, it stands as one of the more prevalent aspectual verb theories in recent years and many of its intuitions are heavily relied on in this current work. While still based on a singular lexical denotation for aspectual verbs, this account essentially dissolves the event/entity complement type distinction relied on by the Type-Shifting Hypothesis. However, the SIH still suffers from several

challenges given both the empirical evidence to be presented here as well as crucial critiques of the stipulative and non-specific nature of various aspects of the theory. The following section addresses these challenges to the SIH in more detail.

2.3.3 Theoretical Critiques of the SIH

One primary theoretical critique of the SIH concerns Piñango and Deo's stipulation of inverse thematic functions as among the set of homomorphic mapping functions accessed by aspectual verbs. In their review of this account, Mourounas and Williamson (2019) refer to these functions as a "theoretically dubious notion" due to two aspects; their event uniqueness requirement and their lack of restrictions regarding function application. Recall that such functions are considered to hold a uniqueness requirement such that they map an individual to "the unique event that the individual bears a participant role to at that time in a given context." Mourounas and Williamson (2019) give the valid critique that a single individual may represent a thematic role of multiple events at one time. As inverse thematic functions relate the individual they take in to different thematic roles with regard to some event (theme, agent), they further argue that this allows for readings where individuals are mis-assigned their respective roles. Though this latter worry may be handled by structural theta-role assignment in the syntax or via pragmatic repair, the former is a justified concern.

I provide a secondary line of critique regarding inverse thematic functions, in that they posit additional compositional processes that are not apparent in other dimensional readings of transitive aspectual verb sentences. Although the SIH considers them to be derived from the same set of encoded dimension functions, the functional subject mapping process undergone in stative constitutive constructions is not the same as the process undergone in agentive CC ones. In constitutive constructions, the subject is homomorphically mapped to a subpart along the structured axis of the complement. Conversely, in CC constructions, the subject is thematically related to the subevent of the sum event expressed by the theme as a specified thematic participant, the agent. As such, these functions, compared to the other dimensional functions, must necessitate an additional thematic relation, and thereby additional compositional complexity.

2.3.3.1   Event Boundaries and *Continue*

Before reviewing the empirical challenges presented in the following chapter, consider now a final theoretical critique that the primary research perspectives reviewed thus far ignore foundational work by Piñón (1997) which holds implications on aspectual verb behavior.

Piñón (1997) focuses his account on the eventive interpretation of aspectual verb sentences, considering them in line with his definition of achievement verbs, adapted from Vendler (1967). He supports the hypothesis that achievements reflect instantaneous events that express the exact beginning or ending of some durative event (or 'happening,' in his words). As aspectual verbs are thought to be part of this set of achievement verbs, it is crucial to consider his account in conceptualizing their eventive interpretation, however, neither type-shifting accounts, Piñango and Deo (2016), nor the account to be reviewed by Mourounas and Williamson (2019) make reference to the claims made in Piñón (1997). As such, these previous theories are missing possible theoretical expansions and crucial foundational considerations about the overall linguistic nature of aspectual verbs.

In Piñón's (1997) formal account for the behavior of achievement verbs, he proposes that the verb's denotations contain semantic operators, appropriately named BEG (20) and END (21), which individually express the initial or final boundary of some durative eventuality. These allow for verb denotations to express instantaneous changes from state to state, noting whether that state is ending or beginning. An important claim of this theory is that aspectual verbs like *begin* and *end* denote **only** these operators, therefore, within this framework, they semantically select for some event argument, specifically. These operators are defined below.

(20)   BEG= $\lambda x \lambda y \lambda X$ ($b_h(X) \wedge$ Ev(y) $\wedge$ Left-Boundary(x, y) $\wedge$ X(y)) $\wedge \neg \exists z$ (z≪y $\wedge$ X(Z $\oplus$ y)))

(boundary *x* begins eventuality *y* of type *X*)

(21)   END= $\lambda x \lambda y \lambda X$ ($b_h(X) \wedge$ Ev(y) $\wedge$ Right-Boundary(x, y) $\wedge$ X(y)) $\wedge \neg \exists z$ (y≪z $\wedge$ X(Z $\oplus$ y)))

(boundary *x* ends eventuality *y* of type *X*)

Piñón (1997) claims that a boundary begins (ends) an eventuality of some type X as long as there is no eventuality immediately preceding (following) it such that the sum of the two eventualities is also of type X (i.e. nothing of the same type precedes (follows) that boundary). He formalizes the ideas of the initial and final edges of an event with 'Left-Boundary' and 'Right-Boundary', respectively. With these simple denotations, the semantic composition of sentence participants can be carried out via function application, as in his example *Rebecca began climbing the mountain* below. Here, *begin* is treated as a raising verb, where *t* represents the trace for *Rebecca*.

(22) Rebecca began climbing the mountain.

   a. $[[begin]] = \lambda X \lambda y\ (\exists z(\text{BEG}(y,\ z,\ X)\ ))$

   $[[climbing]] = \lambda Y'\ \lambda x'\ (\text{Climb}(x') \wedge h(x') \wedge \text{Agent}(x',\ y'))$

   $[[mountain]] = \text{mountain}$

   $[[Rebecca]] = \text{Rebecca}$

   $t = z'$

   b. $[_{V'^1}\ \text{climbing}\ [_{DP}\ \text{the mountain}]]$

   $= \lambda x'\ (\text{Climb}(x') \wedge h(x') \wedge \text{Agent}(x',\ y') \wedge \text{Theme}(x',\ \text{mountain}))$

   c. $[_{VP^1}\ t_i\ [_{V'^1}\ \text{climbing}\ [_{DP}\ \text{the mountain}]]]$

   $= \lambda x'\ (\text{Climb}(x') \wedge h(x') \wedge \text{Agent}(x',\ z') \wedge \text{Theme}(x',\ \text{mountain}))$

   d. $[_{V'^2}\ \text{begin}\ [_{V'^1}\ \text{climbing}\ [_{DP}\ \text{the mountain}]]]$

   $= \lambda y\ (\exists z\ (\text{BEG}(y,\ z,\ \lambda x'\ (\text{Climb}(x') \wedge h(x') \wedge \text{Agent}(x',\ z')))))$

   e. $[_{VP^2}\ \text{Rebecca}_j\ [_{V'^2}\ \text{begin}\ [_{VP^1}\ t_j\ [_{V'^1}\ \text{climbing}\ [_{DP}\ \text{the mountain}]]]\ ]\ ]$

   $= \lambda y\ (\exists z(\text{BEG}(y,\ z,\ \lambda x'\ (\text{Climb}(x') \wedge h(x') \wedge \text{Agent}(x',\ \text{Rebecca})))))$

The resulting denotation in (22e) is a predicate of boundaries that begin an event in which Rebecca climbs the mountain. In this case, the selection of an embedded predicate (*climbing...*) is explicitly denoted in the semantics of the aspectual verb due to its requirement of some durative

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event for it to express boundaries of. Note, crucially, that Piñón (1997) claims that thematic relations may only exist within the durative event. As a result, only these have event participants; boundaries, in contrast, have none, therefore any event participant gathered from the aspectual predicate is derived from the resulting event expressed by the embedded predicate. This semantics, in comparison to the SIH, allows for access to the internal event that the aspectual verb modifies.

This account is relevant to consider within a comprehensive theory as the proposed formalism of event boundaries may assist in accounting for an undiscussed behavior of aspectual verbs, specifically the verb *continue*, that neither the SIH nor any previous theory has addressed. This critique concerns the puzzle of formally linking *continue* within the present set of aspectual verbs. As shown, *continue* seems to behave like other verbs in this set in that it may pair with either event or entity denoting complements and may access a multitude of meaning senses of those complements, along the lines of the dimensional variability of the SIH. It also shares its possible argument structures with the traditional set of aspectual verbs. In this way, it is easy to argue that it should be integrated into generalized aspectual verb theories.

However, this verb shows distinct telicity properties and, in light of the analysis from Piñón (1997), further complicates the notion of initial and final boundaries of semantic objects (events and entities, alike), as it seems to not denote either. *Continue*, on its eventive reading, seems to pick out a subevent that may touch neither the initial or final boundaries of the sum event, but instead it specifies a subevent that follows another subevent within that sum (and of the same type). It reflects the initial boundary (or beginning) of that specified medial event, whether or not that is the final subevent (i.e. whether or not it shares a final boundary with the sum). The SIH accounts for *continue* by proposing that there must exist a function that maps the subpart to the 'small-medial' part of the SI, but this characterization on its own seems vague, perhaps purposefully so.

Given the simplicity of the denotation provided in the SIH, it cannot capture the telicity differences and complex meaning *continue* exhibits. Specifically, it is unique to other aspectual verbs in its ability to have both telic and atelic predicate interpretations. All other aspectual verbs in this set (*begin, start, finish, end*), on their eventive readings, describe telic achievement events

as they reflect instantaneous event boundaries with an encoded endpoint. This is supported by their available composition with *in*-phrases but not with *for*-phrases, as demonstrated in (24). The denotation of *continue* instead necessarily rules out an encoded endpoint, therefore it is compatible with a *for*-phrase and accesses an atelic event, demonstrated in (23).

(23)   The movie continues in 10 minutes / for 10 minutes.

(24)   The movie begins *for 10 minutes / in 10 minutes

The sentence in (23) with a *for*-adverbial receives a reading where, at the time of utterance, the movie (i) has already begun and (ii) continues for 10 minutes, after which the sum event of the movie will likely reach its final subevent containing the end boundary. When read with the *in*-adverbial, which indicates a telic event, the sentence achieves a reading where the movie necessarily (i) has already began, (ii) has stopped, and (iii) will begin again after 10 minutes. This final *after* paraphrase (e.g. *after* 10 minutes) is possible with other aspectual verbs like *begin* and *end*, and such sentences with *in*-phrases may be ambiguous between either meaning. However, because of the nature of *continue*, it cannot specify an endpoint, therefore the only optional reading for the *in*-adverbial phrase in such cases is the 'after' meaning. This kind of 'restarting' interpretation does not easily fall out of the comparatively simple denotation provided in the SIH, which makes no reference to the relation between sub-events within a sum event. While this denotation captures the contextually derived nature of these subparts, it lacks specific logical formalisms that could be more fine-grained in capturing this phenomenon.

To account for this distinct 'restarting' meaning, there must be specifications around the medial sub-event/part of the complement that *continue* modifies, for example, as one which does not share an initial or final boundary with the SI but is contained within it. This would require the specification of aspects about the boundaries of the whole complement, for which the account given by Piñón (1997) is well-suited. As this account provides specifications about the internal event and its boundaries within the formal operators BEG and END, such semantics can be adapted within a comprehensive aspectual verb theory to account for this set of behaviors. For this reason, the integration of specified event boundaries is argued for in the proposal presented in Chapter 6.

In sum, Piñango and Deo's (2016) SIH, as opposed to the prior Type-Shifting hypothesis, can generalize to a wide range of aspectual verb meanings in their transitive constructions. However, this account faces significant theoretical challenges that warrant adjustments to the stipulative mechanisms in the composition. Further, it, perhaps unintentionally, ignores the considerations put forth in Piñón (1997), which have been shown here to be useful in accounting for the distinct telicity and meanings exhibited by the aspectual verb *continue*. As will be shown in what follows, when contextualized within the novel empirical evidence of aspectual verb's varied argument structures and causative interpretations, the SIH can be seen to simultaneously overgeneralize and undergeneralize, being unable to account for all distributional properties that these verbs show. Such evidence and their implications are reviewed in the following chapter.

CHAPTER 3

NOVEL COUNTER-EVIDENCE: VARIED ARGUMENT STRUCTURES

3.1 Introduction

This chapter presents novel evidence involving the selective transitivity alternations that aspectual verbs may undergo, along with other variable constructions they appear in, outlining the theoretical implications they provide. Neither the Type-Shifting Hypothesis nor the more general SIH considers this set of empirical evidence and as such miss possible theory generalizations. As will be shown, much of this data highlights the re-emergence of the event/entity complement type distinction, providing a crucial challenge to the generality of the SIH.

The constructions to be reviewed here expand beyond the traditionally researched transitive of the form *x began y* by considering what I call the bare intransitive, *x began*, as well as forms such as *x began with y* along with a three argument structure as in *z began x with y*. These constructions are introduced in this order and examined throughout this chapter. First addressed, however, is the causative nature of certain transitive aspectual verb constructions, followed by a comparison between aspectual verb transitivity alternations and classic (anti-)causative frameworks. The bare intransitive structures that aspectual verbs selectively participate in are the primary focus of this chapter as well as their specific challenges and implications for a comprehensive theory. This chapter sets up a discussion of the novel theoretical approach argued for in later chapters.

3.2 (Anti-)Causative Alternations

A crucial observation about the thematic nature of aspectual verb sentences has been independently made in both Mourounas and Williamson (2019) and my work in Cousins (2021); namely, that aspectual verbs on their eventive agentive readings may alternate between a causative transitive form and a non-causative intransitive. The transitivity alternations that aspectual verbs undergo are shown to pattern with verbs whose underlying thematic structure is deemed *(anti-)causative* (Levin 1993, 2009). Before the analysis presented here and the one in Mourounas and Williamson (2019), previous theories primarily considered only the transitive cases of aspectual verb predicates, thus discussing their varied syntactic constructions contributes to a more general perspective of

their linguistic behavior, and further highlights a re-ignition of the event/entity complement type distinction.

To review, Levin (1993) lists over 200 English verbs that participate in (anti-)causative alternations, also called a *diathesis/voice shift*, and notes it as a productive linguistic subsystem. Such alternations are considered *labile* alternations in English, where the causative and anticausative verbs take the same surface morphological form (Haspelmath 1993).[1]

With typical (anti-)causative verbs, like *break, melt, open*, etc., the transitive form explicitly realizes a *cause* argument in the subject position, thus is considered to denote a *causative* eventuality. Causative predicates describe eventualities that involve a cause argument with immediate control over the eventuality they express, which is often structured as an external causing event of an internal durative eventuality or resultant state (Everaert et al. 2012; Levin et al. 1995; Neeleman, Van de Koot, et al. 2012). Alexiadou (2014) and Alexiadou (2011) states that typical (anti-)causative predicates refer to spontaneous change of state events. For example, *Lia burned the paper* denotes a causative event where *Lia* is the agentive causer of an event of burning of *the paper*, which then results in a spontaneous change of state in the complement (i.e. being burnt). This is evident given the possibility of the paraphrase *Lia caused the paper to burn*. The cause argument may be an animate agent, as in this case, but it may also be realized as an event (*The firework explosion burned the stage*) or some other natural force (*The forest fire burned the trees*) (Hovav and Levin 2012; Hovav 2014; Reinhart 2002). Examples (25) and (26) below demonstrate these causative readings in the transitive with typical (anti-)causative verb *break* and aspectual verb *begin*, respectively.

(25)   a.   The little girl broke the vase.

→ The little girl *caused* the vase to break.

(26)   a.   Mary began the movie.

→ Mary *caused* the movie to begin.

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[1]This study does not disregard the multiple crosslinguistic studies which have examined the complex morphological structures of both anticausative and causative variants, but does not consider it further here. However, as pointed out by a reviewer, a morphological account which promotes a silent morpheme as the crux of the alternation pattern in English may be entirely possible, though is not explored in this dissertation.

Intuitively, the transitive subjects in these examples denote an agentive *cause* argument, as evidenced by the fact that both sentences may receive true causative paraphrases. The intransitive variant of (anti-)causative verbs, however, does not realize this external argument and does not assign a cause; as such it is deemed the *anticausative* form. Consider the following examples which show alternations resulting in the intransitive forms of the same set of verbs. This showcases an intransitive aspectual verb construction of the form *x began*, which has thus far not been analyzed in any previous comprehensive theory.

(27) a. The little girl broke the vase.

b. The vase broke (in an instant).

(28) a. Mary began the movie.

b. The movie began (at midnight).

In the case of the intransitives, the object theme of the transitive moves to the subject position, and there is no argument specified as the cause of the event. These (anti-)causative transitivity alternations are distinct from other kinds of transitivity alternations like in *dispositional middles* and *passives*, as shown below in (29).

(29) Mary began the movie.   causative

a. The movie began.   anticausative

b. The movie was begun.   passive

c. The movie begins slowly.   dispositional middle

Passives, as is well known, are intransitive forms of active structures that contain an implicit (understood, but unexpressed) agent argument (which may also act as a cause). The dispositional middle is characterized as describing a dispositional property of some theme, having a lack of specific time reference, thus receiving a stative interpretation (Alexiadou 2014), and lacking an external argument altogether (Alexiadou 2012). Middles tend to, and in some languages must, include an adverbial or modal element, like *slowly* in the above example.

The sentences in (30)-(32) demonstrate the distinction between the three discussed constructions, showing that while the passive may realize its implicit external argument in an accompanying *by*-phrase, this is not possible in either the anticausative or the middle.

(30)   The movie began/ended/continued *(by Mary).   anticausative

(31)   The movie was begun/ended/continued (by Mary).   passive

(32)   The movie begins/ends/continues slowly *(by Mary).   dispositional middle

Much research has been devoted to understanding the internal thematic structure of the anticausative variant, with some claiming that there exists an implicit cause within the lexical structure of the verb (Levin et al. 1995), while others rely on non-lexical representations of cause within the syntax (Alexiadou 2010; Kallulli 2007), or *conceptual* causal reasoning (Härtl 2003) (see also Alexiadou 2014; Doron 1999, and Piñón 2001). However, evidence from Härtl (2003) and Rakosi (2012) point to anticausatives, like middles, not encoding any external thematic cause argument either explicitly or implicitly. The following examples adapt this evidence to show that both aspectual verb constructions and typical anticausative constructions fail to license purpose/rationale clauses or Agent-Oriented modifiers, whereas e.g. passives can, demonstrated in (33) and (34). This can be captured by a lack of an internal argument; anticausative predicates cannot assign volition as there is no embedded (PRO) argument to be considered animate or volitional with respect to the durative event.

(33)   a.   The plate was broken [(in order) to collect the insurance].

       b.   The plate broke *[(in order) to collect the insurance].

                                                                                    Härtl (2003)

       c.   The movie was begun/continued/ended [(in order) to provide a diversion].

       d.   The movie began/continued/ended *[(in order) to provide a diversion].

(34)   a.   The plate was broken (deliberately/on purpose).

       b.   The plate broke *(deliberately/on purpose).

                                                                                    Rakosi (2012)

c. The movie was begun/continued/ended (deliberately/on purpose).

d. The movie began/continued/ended *(deliberately/on purpose).

Along with their lack of an implicit or explicit external argument, anticausatives have been analyzed by Härtl (2003) and Rakosi (2012) as generally lacking any underlying causative event structure. In other words, on this account only transitive causative sentences encode a causal event structure; intransitive anticausatives do not inherently denote any causal relations between thematic participants. Härtl (2003) supports this view by showing that a *because*-clause, which introduces a direct cause argument, is unacceptable with the causative form in (35a), which already marks the causative subject *Lia*, but grammatical with the anticausative in (35b). This is replicated in aspectual verb predicates demonstrated in (36a) and (36b).

(35) a. ??Lia broke the vase because she threw it.

b. The vase broke because Lia threw it.

(36) a. ??Mary began the movie because she pressed play.

b. The movie began because Mary pressed play.

In this analysis, the infelicity of the above causative transitive examples is due to a clash between the inherent causal relation expressed by the matrix predicate and the direct cause introduced by the *because*-clause. The intransitive anticausative structures, however, do not have an underlying cause structure, thus no clash occurs.

Overall, the evidence collected and analyzed here demonstrates the systematic patterning of aspectual verbs with other (anti-)causative verbs, suggesting that they be analyzed under similar frameworks. If this (anti-)causative lens is to be used to better understand aspectual verbs, it is important to discuss the derivational relationship between anticausatives and their causative constructions, as it will inform the lexical starting point for aspectual verbs. In other words, we must understand the nature of the relationship between the base form and the potentially derived form, examined further in Chapter 4.

3.3 Intransitive Asymmetries and Varied Argument Structures

3.3.1 The Phenomena

A grammatical asymmetry is revealed when analyzing aspectual verbs' bare intransitive composition with varied complement types, behaving differently with events compared to entities. Consider the distinction between the following bare intransitive aspectual verb sentences, which are acceptable with the event denoting complement *movie* in (37), but not with the entity complement *book* in (38).

(37)   The movie began.

(38)   *The book began.

It is evident that *movie* on its own expresses an event intuitively, while *book* expresses an entity, as the former may reference the event either temporally or spatially, as in *The movie played at noon* or *The movie took place downtown*, and may also describe the event runtime, as in *The movie was two hours long*. Conversely, the latter may not make such reference, as no event is implicitly reflected by the complement denotation, as evident by the unavailability of **The book played/read at noon*, **The book took place in the living room*, and **The book was 2 hours long*.

The pattern in (37) and (38) contrasts the availability of both complement types in transitive constructions. This issue does not seem to arise from agency requirements on the verb, as with either complement, the transitive forms may appear with a non-agentive subject; e.g. *A note from the author began the book* and *A gloomy close-up began the movie*. This data seems to suggest that in the absence of an external argument, the intransitive aspectual predicate is in some way restricted to an event denoting complement, a pattern in line with the assumptions of type-shifting aspectual verb theories (McElree et al. 2001; Mourounas and Williamson 2019; Traxler et al. 2002). As such, this selectional difference seems to pose a challenge to the type-flexible account of Piñango and Deo (2016).

As has been demonstrated, an important consideration in examining aspectual verbs is how they relate their thematic participants to each other. The discussion in section 2.4.1 showed that

anticausatives cannot realize an agentive external argument via a volitional *by*-phrase, taken as evidence of their lack of an implicit external cause argument. Such a cause argument may be ascribed to the predicate via a *because*-clause, forcing a causative interpretation. In a similar sense, it appears that the external subpart argument in transitive aspectual verb constructions may be introduced to its bare intransitive variant via what Mourounas and Williamson (2019) call a **specificational** *with*-phrase, resulting in an acceptable sentence with either complement type. Consider the following examples of the form *x began with y*, which are shown here to represent the intransitive forms of the transitive examples in (5), (6), and (9)-(12), respectively, now with the addition of a *with*-phrase on the aspectual predicate.

(39) a. The fight began with the brawny boxer.

   b. The book began with a note from the author.

(40) a. The row of toys begins/ends/continues with the porcelain doll.

   b. The hiking trail begins/ends/continues with this little sign.

   c. The concert begins/ends/continues with a piece by Vivaldi.

In each case, the subject of the transitive corresponds to the embedded noun within the *with*-PP in the intransitive. Notice that the stative event structure and the specified constitutive dimension denoted by the transitive forms in (9)-(12) remains consistent in the modified intransitive forms in (40a)-(40c), acting as true paraphrases. The intransitive forms in (39), however, are now unable to be interpreted with the same eventive reading as their transitive counterparts given the lack of an agent role. When introduced within this *with*-phrase, instead, the interpretation of *the boxer*/*the author* is as denoting a constitutive part of *the fight*/*the book* along some relevant dimension. This property persists even in the presence of temporal adverbials that independently indicate eventive readings. Consider (41).

(41) a. The movie began at midnight.

   b. The movie began at midnight with a gloomy close-up.

In (41a), the sentence achieves the expected eventive reading, where the temporal adverbial *at midnight* modifies the expressed event's temporal reference point. However, in (41b), where *with* introduces *a gloomy close-up* after the temporal adverbial, the sentence achieves a constitutive interpretation.

In the same sense as a passive *by*-phrase, these constitutive *with*-phrases seem to be unique in the kind of thematic argument they introduce, specifically picking out a *subpart* argument. Mourounas and Williamson (2019) take this instance of *with* to be distinct from an instrumental interpretation, as supported by (42) which shows that intransitive aspectual verbs are uninterpretable with a true instrumental *with*.

(42)   a. The victim stopped their attacker's advance (with a crowbar).

     b. The attacker's advance stopped *(with a crowbar).

     c. The astronaut continued her journey to the moon (with secondary thrusters).

     d. Her journey to the moon continued *(with secondary thrusters).

     e. The official began the London marathon (with a flag).

     f. The London marathon began *(with a flag).

<div align="right">adapted from Mourounas and Williamson (2019)</div>

Mourounas and Williamson (2019) define this instance of *with* with the following denotation, which says that it 'specifies' a subpart argument within an aspectual verb predicate. This *with* is thought to take in a predicate of events that modifies some subpart argument *x*, which is specified as an individual *y*.

(43) $[[with]] = \lambda y.\ \lambda P_{\langle e,t \rangle}.\ \lambda x.\ P(x) \wedge x = y$

However, considering the restriction it imposes towards constitutive dimensions, a more apt and precise classification for this *with*-phrase is one that encapsulates its mereological specificity, therefore this dissertation will henceforth refer to it as **constitutive *with***. The possibility of this constitutive *with*-phrase in intransitive aspectual verb sentences makes them unique from other (anti-)causative verbs given their mereological characteristics. While other (anti-)causative verbs

may appear with a *with*-phrase, this instance is of an instrumental *with*, introducing an instrument argument. Compare, for example, the anticausative forms of (anti-)causative verb *break* and aspectual verb *begin* below.[2]

(44)   The vase broke *(with a hammer).

(45)   The movie began (with a gloomy close-up).

Lastly, notice that the same unacceptable bare intransitive in (38) is now acceptable with the addition of the subpart argument in this *with*-phrase in (39b), where the resulting interpretation is constitutive. The reasoning for this apparent rescue of the bare intransitive form with an entity theme is explored further in Chapter 4.

A final construction to consider in terms of aspectual verbs' complex compositional behaviors is their three-argument predicate structure of the form *z began x with y*, as shown in (46) (with contextual aid in interpretation, though not necessary).

(46)   Context: *Lia is a famous author. She has been going back and forth in her head on whether she wants her new book to open with a note from the author or with a quote. In the end,...*

   a. Lia began the book with a note from the author.

The above example seems to combine the compositions of an agentive eventive transitive construction, where (i) *Lia* is the agent of some subevent (e.g. writing) associated with the theme, the *book*, and the constitutive *with* construction, where (ii) the subpart of the *book* is specified in a *with*-phrase as *a note from the author*. Given that neither Piñango and Deo (2016) nor the alternative account by Mourounas and Williamson (2019) give any examples of this unique construction, this poses new theoretical territory for a comprehensive aspectual verb theory. As both theories depend in some way on the retrieval of a single relevant dimensional function for the complement to fall

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[2]Note that instances of constitutive *with* (in American English) seem to primarily appear in aspectual verb contexts, but may also appear with the verb *open* with both an entity complement, as in *The book opened with a note from the author* and with an eventive complement in *The door opened with a creak*. The same applies to the verb *close*. In this sense, these variant could be analyzed as an aspectual verb in their own right, expressing a similar meaning as *begin* and *end*. It's unclear, however, what other linguistic phrase explicitly introduces a subpart argument. Such considerations are absent in Mourounas and Williamson (2019) and are likewise left for future research here.

along, this data introduces a significant puzzle. The following section reanalyzes this set of novel examples within the framework of the SIH, detailing the specific theoretical and compositional implications of each.

3.3.2 Implications for the SIH

While Piñango and Deo (2016) seem to give the most general account for aspectual verbs, given the (anti-)causative transitivity alternations, variable argument structures, and selectivity patterns discussed here, their SIH can be seen to both undergeneralize and overgeneralize simultaneously. It undergeneralizes as its semantic account for typical transitive structures (*z began x*) does not translate to the varied argument structures aspectual verbs may undergo, including the intransitive (variably anticausative) (*x began*), constitutive *with* structure (*x began with y*), and three-argument predicate (*z began x with y*). As Piñango and Deo (2016) restrict their account and do not consider these constructions, their semantics ends up making incorrect predictions about such examples. Revisiting their denotation for typical aspectual verb *begin* below in (47), even in the case that the internal argument satisfies the SI presupposition, the compositional process for the bare intransitive, hypothesized in (48) is shown to result in a partial integration of arguments, where an external argument is left unsatisfied. As such, the example *x begins* should be unacceptable given the two-argument predicate semantics in the SIH, though select complements may indeed enter into this construction.

(47) $[[begin]] = \lambda x_\tau \, \lambda y_\sigma : \textbf{struct-ind}_{f_c}(x). \, \exists f'[f'(y) <_{small\text{-}init} f_c(x)] \, (x)$

(48) $[[x \, begins]] = \lambda y_\sigma : \textbf{struct-ind}_{f_c}(x). \, \exists f'[f'(y) <_{small\text{-}init} f_c(x)]$

Conversely, it could be said that the *y* variable, representing the agent in the transitive, receives existential closure, thereby avoiding a compositionally incomplete function. However, if this were the case, the meaning would be inaccurately predicted to express that there exists some *y* such that $f'(y)$ is mapped to a small initial part of $f_c(x)$. In other words, under this intransitive variant for the SIH, the construction *x began* would essentially mean that some agentive object began *x*, acting as a paraphrase for the passive structure, which is inadequate as no agentive role is realized or

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accessible in bare intransitive constructions.

The SIH also posits the existence of contextually determined homomorphic functions that relate their internal and external arguments to a dimensional structure, which are then mapped to one another via a subpart relation. Given that no secondary argument is provided in (48), no contextually derived function is accessed to homomorphically map the external argument to (the initial subpart of) some dimensional structure.

Furthermore, the SIH does not indicate how the constitutive *with*-phrase (*x began with y*) is integrated into aspectual verb composition. Though, with a proper denotation of this phrase, the two-argument denotation above could be adapted to account for such sentences as both the SI and subpart argument are supplied (akin to stative transitives). However, even when incorporating the denotation for this *with* given by Mourounas and Williamson (2019) to account for this, additional compositional issues arise when considering the three-argument structure (*z began x with y*) given the restricted semantics of the SIH.

There is firstly the fact that there exists no formalism to integrate a third argument into the compositional process given a two-argument predicate denotation. Beyond this, such examples showcase a third interpretation of aspectual verb predicates; rather than the SI argument falling along only an agentive eventive dimension (eg. *Lia began (reading) the book*) or only a constitutive one (eg. *A note from the author began the book / The book began with a note from the author*), transitive sentences which incorporate a third argument via the constitutive *with*-phrase (eg. *Lia began the book with a note from the author*) seem to achieve both interpretations simultaneously. In such cases, the subject remains an agentive participant of some event (eg. writing) associated with the complement as the theme, thus the SIH should predict that both arguments enter into the composition and are mapped to one another via inverse thematic functions. However, with the addition of a relevant subpart argument into the composition via the *with*-phrase, another reading is accessible where the subpart and SI complement are mapped to one another via constitutive functions. Under the SIH framework, this indicates that the SI argument undergoes simultaneous homomorphic functional mapping to two different structural dimensions at once, which should be

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predicted to result in a contradictory reading. Oppositely, as the *with*-phrase is combined as an adjunct, the SIH could instead predict that the singular available reading is one which realizes only the dimensions contextually relevant to the main arguments of the predicate, the agent and SI theme, i.e. only the agentive eventive reading should be accessible. Yet, the actual resulting reading seems to overlap both the dimensional interpretations of the SI complement, resulting in a reading where it behaves both as a thematic theme and as a constitutive whole. Given the restricted semantics of this prior account, it does not currently have formalism to accurately predict this variety of argument structures and composition.

A final way in which the SIH undergeneralizes is that it similarly does not give any account for how (anti-)causation should be incorporated into the semantics of aspectual verbs, whether lexically or non-lexically. The transitivity alternations and causative interpretations cannot be accounted for by prior aspectual verb theories alone without the incorporation of an (anti-)causative perspective, as is presented here.

The SIH simultaneously overgeneralizes in that it essentially dissolves the event/entity distinction between complement types, as was held by the previous Type-Shifting Hypothesis, and considers all acceptable complements under the type-flexible umbrella of a *structured individual*. This prohibits a formal mechanism to explain the asymmetry between bare intransitives (eg. *The fight began* and **The book began*). Within this theory, both complements should be acceptable as they both fulfill the presuppositional requirement of being an SI, though this prediction is not borne out given their asymmetrical acceptability. In sum, the novel empirical evidence reviewed thus far demonstrate significant challenges to the prior account of the SIH, suggesting that a more comprehensive theory is necessary to account for the myriad of behaviors aspectual verbs show.

The remainder of this chapter is devoted to addressing the empirical predictions made by another prior account for aspectual verbs as given by Mourounas and Williamson (2019), who do distinguish between event and entity complement types within aspectual verb composition. While the SIH considers aspectual verbs to be type-flexible, Mourounas and Williamson's account, to be covered in more detail in Chapter 5, assumes that aspectual verbs are type-specific. Though this

idea seems in line with the novel bare intransitive evidence presented here, it introduces a question about the generality of either approach. Regardless, this account makes empirical predictions that are shown to not be entirely accurate when reviewing the experimental evidence presented here. The following section introduces the relevant claims and details the experimental methodology and contradicting results.

3.4 Experimental Support for Constitutive Readings

In their account of aspectual verbs, Mourounas and Williamson (2019) similarly critique the generality of Piñango and Deo's SIH, claiming that it makes additional false predictions. However, some of their claims are shown to be challenged given experimental evidence initially presented in Cousins (2021). Specifically, they claim that transitive aspectual verb constructions with inanimate subjects like (49), though argued to be acceptable under the SIH, are considered 'significantly degraded' by native English consultants.

(49)   a. The doll began the row of toys.

       b. The letter 'A' starts the alphabet.

They continue by noting that while these structures "are attested in archaic/literary registers of English, native English consultants unanimously found them marked;" this assumption carries through to their theoretical approaches as their primary motivation for the stative interpretations of aspectual verbs does not come from such structures, but rather the existence of stative constitutive *with* constructions. Based on the robust evidence to be reviewed here, this dissertation argues that the comparable acceptability of transitive stative structures warrants their inclusion in the theoretical consideration of general aspectual verb behavior.

In critiquing their claim that these constructions are unacceptable or highly marked in English, it is important to notice the semantic structure of these sentences: the aspectual verb relates an inanimate subpart, the subject, to an SI object, resulting in a constitutive reading. Notably, these same constructions are shown to be accessible in an offline acceptability study in Cousins (2021), which tested 30 American English-speaking participants on available dimensional interpretations

across different contexts.

This study intended to answer questions about contextual effects on the interpretation of transitive aspectual verb sentences by applying a dimension-biasing grammatical context in the form of a clausal adverb before the predicate. For this study, two classes of adverbs were considered and compared. Mental Attitude (MA) adverbs (*willingly, frantically, deliberately*, etc.), a kind of Subject-Oriented adverb, specify a mental state of some experiencer either before or during an event, e.g. a mental state of being willing, frantic, deliberate, etc. (Ernst 2001). Because these adverbs restrict to an experiencer, if encountered at the beginning of the sentence, they implement a semantic requirement for the subject argument to be interpreted as that experiencer. These are compared to Agent-Oriented (AO) adverbs (*rudely, cleverly, tactfully*, etc.), another kind of Subject-Oriented adverb, which describe only an agent and event, not an experiencer. Lastly, Speaker-Oriented (SpO) adverbs (*surprisingly, oddly, weirdly*, etc.), which make some comment on the speaker's state (Ernst 2001), were used in the same condition as AO adverbs. Respective examples of these can be seen in (50) and (51) below.

(50)   Mental-Attitude adverb

Absentmindedly, Lia began the book.

(51)   Agent-Oriented/ Speaker-Oriented adverb

Stupidly/ Oddly, Lia began the book.

MA adverbs, as opposed to AO/SpO adverbs, impose certain interpretational restrictions when preceding an aspectual verb phrase. For example, (50) is interpreted as eventive, where *Lia* is an absent-minded experiencer and agent; in this case, *the book* is interpreted along the *eventive* dimension, resulting in an agentive reading. Crucially, this is the only interpretation when an aspectual verb sentence is preceded by an MA adverb, i.e. they cannot access a constitutive reading. In comparison, when preceded by an AO/SpO adverb (as in (51)), the same agentive reading can be achieved, where either the manner of the activity was stupid/odd or simply that it was stupid/odd for *Lia* to have engaged in the activity, along with a constitutive reading, where it was odd/stupid

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for e.g. Lia's character to be the first in the book. Though both of these adverb conditions can select for an agent, MA adverbs force that agent to be interpreted as an experiencer (thereby, animate), therefore the only available dimension for the predicate interpretation is eventive. AO/SpO adverbs, however, have no such requirement, thus the readings remain ambiguous between agentive and constitutive. Therefore, by using MA adverbs in a clausal position, before both the aspectual verb predicate and the contextual information provided by the subject (animacy, etc.), available dimensions can be restricted to only the eventive agentive dimension. This grammatical contextual manipulation further serves as a comparison to the pragmatically-biasing context tested in previous aspectual verb studies (Lai, Braze, et al. 2017; Lai, Lacadie, et al. 2017; Lai and Piñango 2017, 2019).

3.4.1 Stimuli Design

Experimental stimuli included 50 trios like the one below, containing three adverb context conditions; EventBiasing with an MA adverb, NonBiasing with an AO/SpO adverb, and NoAdv without an adverb. The resulting experimental conditions are listed below.

Adverb context	Stimulus
EventBiasing	*Willingly*, the student *began* the book about dragons.
NonBiasing	*Cleverly*, the student *began* the book about dragons.
NoAdv	The student *began* the book about dragons.

Each NP complement was deemed interpretable both as constitutive as well as eventive to avoid any potential bias. The sentence subjects were selected to be compatible with the NP complement, but to not restrict to any reading (as with the subject in *The prologue began the book.*), with each subject noun being preceded by the determiner "the". Within the stimuli, six lists were created in a Latin square design, each containing 50 individual stimulus sentences. The lists varied by adverb condition per stimulus sentence so that each contained an equal number of sentences from each condition.

3.4.2 Pretests

To ensure that the stimuli noun complements were acceptable complements of their respective aspectual verbs cross-conditionally, a fill-in-the-blank NP-cloze test was conducted via the online survey platform Qualtrics (www.qualtrics.com). Cloze test participants included 30 native English speakers selected semi-randomly through Prolific (www.prolific.co)[2022], with set demographics of participants located in the United States and between the ages of 16-30 years old. Participants were compensated $3.00 USD via Prolific. The same parameters were used in the verb norming and acceptability tests. For this cloze pretest, three lists of 50 sentences each were randomly distributed across participants. Participants were presented with stimulus sentences up to and including the determiner of the noun complement (*(Happily,) the woman began the* _____), with no other context, and asked to indicate how they would complete the string with a noun.

Participants' responses were compared with the actual experimental noun complements to determine how probable the target noun was, which was converted into a percentage for each. Cloze proportions for each condition considered not only instances where the noun provided was an exact match to the target, but also those which can be considered synonymous with it (e.g. 'note' and 'memo', letter' and 'book'). Proportions of matches and synonyms per condition were as follows: EventBiasing (match = 1.68% / synonym = 17.67%), NonBiasing (match = 1.8% / synonym = 15.39%), NoAdv (match = 1.978% / synonym = 18.76%). A statistical Analysis of Variance (ANOVA) showed no statistical difference between match proportions across conditions $(F(2) = 0.014, p = 0.986)$ suggesting that there was no evidence of a difference in matching the target noun across adverb conditions.[3]

Log frequencies of stimulus adverbs were determined from the Corpus of Contemporary American English (COCA; https://www.english-corpora.org/coca/) to ensure that frequency differences across conditions would not affect processing. Mean raw adverb frequencies and their respective logarithm transforms were as follows: EventBiasing = 1662.64 (log = 2.94) and NonBiasing =

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[3]Note that the magnitude of the match proportions shows that, generally, the exact target words were unpredictable. However, synonymous proportions were significantly higher, suggesting that the interpreted dimensional axis of the target complement was still predictable.

2948.28 (log = 3.16). A Welsh test shows no statistically significant difference in adverb log frequencies across the two conditions (t(49) = -1.78, p = 0.08), suggesting that adverb frequency did not significantly differ across adverb conditions.

Finally, to avoid significant variations in the length of stimulus adverbs affecting processing, a cross-conditional analysis of adverb length was conducted. Mean adverb lengths in characters were 9.19 (EventBiasing) and 9.57 (NonBiasing). A Welsh test shows no significant difference in adverb length across conditions (t(49) = -0.90, p = 0.37).

3.4.3 Acceptability Judgement Task

An acceptability judgment task was run on the aspectual verb sentences to examine available dimensional interpretations, whether multiple or single, across context conditions. This study included a total of 30 participants across six groups, each randomly shown one of six lists containing 25 stimulus sentences as well as 12 filler sentences split 1:2 between unambiguous (4) and ambiguous (8). Questions and choice displays were randomized for each participant. Participants were asked if a given aspectual verb sentence could be re-phrased as (A) an agentive eventive paraphrase, (B) a stative constitutive paraphrase, or (C) "Both", an ambiguous reading. For example, the sentence '*Boldly, the young musician began the album of indie folk songs*' had the possible interpretations (A) '*Beginning the album of indie folk songs with the young musician was bold.*', (B) '*It was bold for the young musician to begin playing the album of indie folk songs.*', and (C) 'Both'.[4] The structure of filler answers similarly mirrored that of the experimental ones.[5]

As practice before the survey, participants were instructed to view multiple examples of ambiguous aspectual verb sentences as well as unambiguous eventive-biasing and non-biasing sentences (without adverbs). This was done to ensure their awareness of the relevant potential ambiguity

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[4]Notably, many paraphrases with an event-biasing MA adverb in a stative constitutive interpretation resulted in a semantically infelicitous sentence. This is to be expected due to the mismatch between the adverbs' selectional requirements of the subject and the now contextually defined non-agentivity of said subject.

[5]For an unambiguous filler sentence like '*Perfectly, the performer sang out her lines to the audience.*', the possible interpretations are (A) '*The performer perfectly sang to the audience.*' as a plausible reading, (B) '*The audience perfectly sang to the performer.*' as an implausible reading, and (C) 'Both'. An ambiguous sentence like '*Slowly, the leader brought the bat on stage.*' gives two plausible paraphrases; (A) '*The leader was slow as he brought a flying bat on stage.*' and (B) '*The leader was slow as he brought a baseball bat on stage.*', therefore the expected option is (C) 'Both'.

and provide them with a better ability to grasp the different dimensions without being exposed to experimental conditions (e.g. biasing adverbs).

Predictions for the acceptability results were threefold; (1) that the EventBiasing adverb condition would show a significantly higher number of choices for the agentive paraphrase compared to the NonBiasing and NoAdv adverb conditions due to the former's dimension restricting context, (2) that the number of choices for the 'Both' option would be significantly higher in the NonBiasing and NoAdv conditions compared to the EventBiasing condition due to the prior two's dimensional ambiguity, and (3) that there would be no distinction between the number of choices for the constitutive paraphrase across conditions since there was no instance were only this paraphrase was available.

3.4.3.1 Data Analysis

A logistic mixed model analysis was conducted considering three comparisons across adverb conditions: (1) the choice of the agentive paraphrase, (2) the choice of 'Both,' and (3) the choice of the constitutive paraphrase. The data format categorized participant responses as a binomial indicator of paraphrase choice so that the paraphrase chosen was marked "1" and the others were marked "0" for that specific stimulus. Three models were created to test each comparison. Model selection under the AIC (Akaike Information Criterion) method revealed that a model with adverb condition as a fixed effect, subject, item, and list as random intercepts was the best fit for all models. Regressions were created using the *glmer* function in the *lme4* package (Bates et al. 2009) in R (R Core Team, 2017).

3.4.3.2 Results

Response counts across adverb conditions are shown in the following figures.
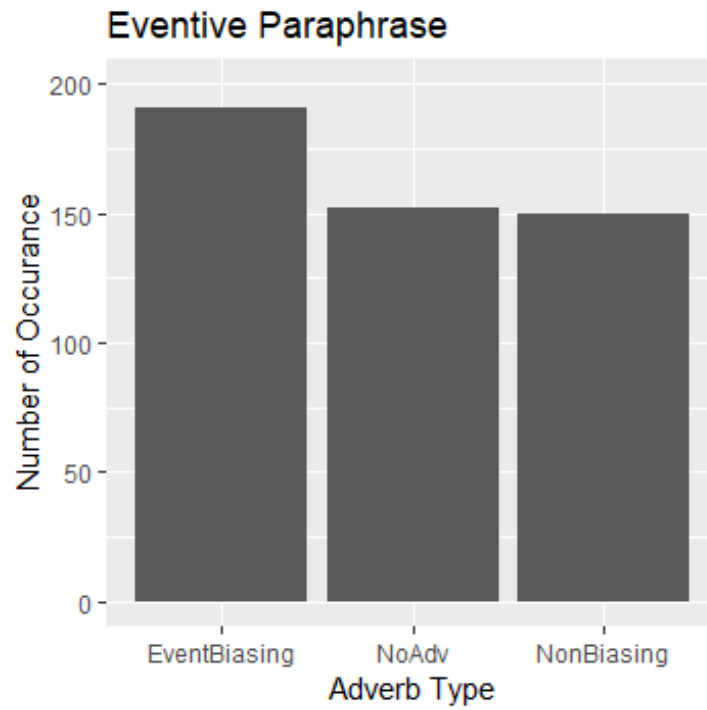
Figure 3.1 Agentive model

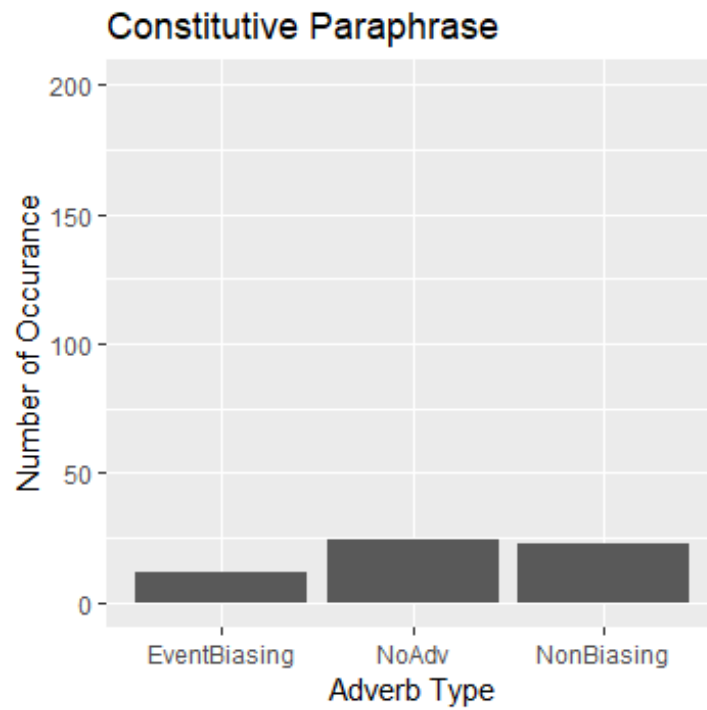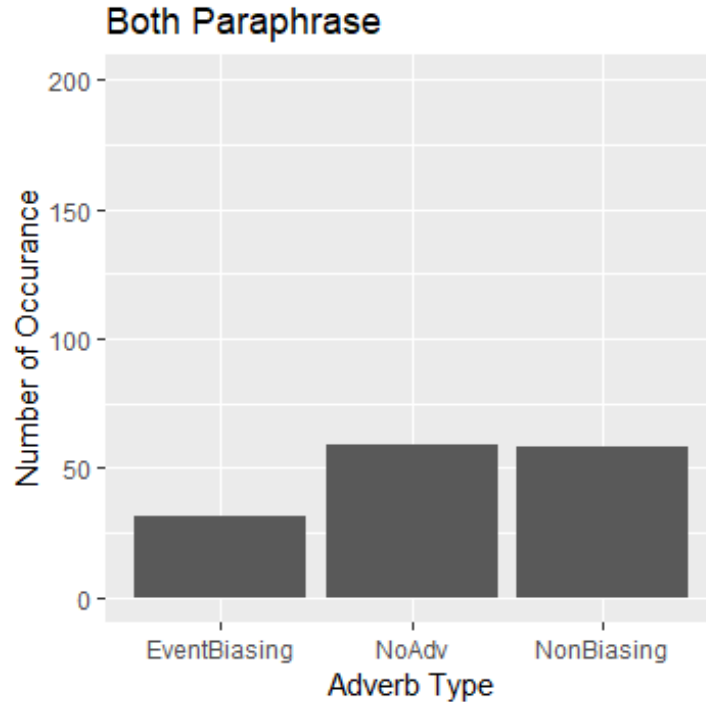Figure 3.2 Constitutive model

Figure 3.3 Ambiguous model

P-values for the coefficient estimates of the linear regression models were found using the *lsmeans* package (Lenth 2016) and corrected via Tukey adjustments. All paraphrase models showed a significant difference across conditions, prompting planned pairwise testing.

Analysis of the Agentive model showed that participants more frequently chose the agentive paraphrase when they read sentences with an MA EventBiasing adverb compared to sentences with an AO/SpO NonBiasing adverb (β = 1.26, z = 3.5, p = 0.001) or without an adverb (β = 1.25, z = 3.43, p = 0.001). There was no significant difference in choice of the agentive paraphrase between the latter adverb conditions (β = 0.02, z = 0.05, p = 0.1). This evidence suggests that the EventBiasing context successfully biased towards the agentive paraphrase such that it was the only paraphrase possible for that condition.

The Ambiguous model showed a similar pattern in that the "Both" response was chosen significantly less in the EventBiaisng context than in both NonBiasing (β = -1.05 z = -3, p = 0.007) and NoAdv conditions (β = -1.04 z = -2.98 p = 0.008). However, there was no significant difference found between the NonBiasing and NoAdv conditions (β = -0.01, z = -0.05 p = 0.1) in the choice

of the "Both" paraphrase. This provides evidence that dimensional ambiguity remains in aspectual verb phrases in these non-biasing contexts, but, as shown in the Agentive model results, can be restricted via EventBaising adverbs.

Lastly, analysis of the Constitutive model showed unpredicted, though explainable significant differences between paraphrase conditions. The constitutive paraphrase was chosen significantly less in EventBiasing contexts compared to NonBiasing (β = -1.22, z = -1519, p < 0.0001) and NoAdv (β = -0.87, z = -1075, p < 0.0001), which can be accounted for given that EventBiasing contexts restrict the constitutive reading, whereas the other two conditions remain ambiguous. However, interestingly, further pairwise comparisons showed that constitutive responses occurred less in NoAdv contexts than in NonBiasing contexts (β = -0.36, z = -313, p < 0.0001). Notably, the constitutive paraphrase was chosen significantly fewer times than either paraphrase option, predicted to be due to the unavailability of it as the only paraphrase possible for any given stimulus.

3.4.3.3 Discussion

Taken together, these offline acceptability results support the hypotheses that (a) these aspectual verb sentences are indeed ambiguous when not biased by context, supporting the intuitions in Piñango and Deo (2016), and (b) Mental-Attitude Adverbs serve as legitimate grammatically biasing contexts that restrict interpretations to only the agentive eventive dimension. This data not only provides foundational evidence for this kind of grammatical bias and sets the stage to test the online processing of these same structures, but presents challenges to the claims made by Mourounas and Williamson (2019). Recall that Mourounas and Williamson (2019) critique the SIH by stating that the constitutive interpretation of transitive aspectual verb sentences is highly marked or unacceptable to native English speakers, only evident in archaic language, therefore their theory need not account for such constructions.

Once again, however, take notice of the semantic structure of such sentences: the aspectual verb relates an inanimate subpart, the subject, to a structured individual, the object, resulting in a constitutive reading. As has been established, though, constitutive readings are indeed accessible, though notably marginally so, in the purposefully ambiguous sentences used in the Acceptability

study presented here, reiterated below in (52).

(52)   a. (Unexpectedly,) the strange lady continued the list of bridesmaids and groomsmen.

        i. The list of bridesmaids continued with the strange lady.

    b. (Appropriately,) the editor finished the story by a famous Young Adult author.

        i. The story by a famous Young Adult author finished with (a note from) the editor.

In either case, regardless of clear saliency for the agentive reading, the subject may be interpreted either as an agentive causer of some salient event associated with the object or as an inanimate subpart of some SI complement. The latter meaning (exemplified in the (i) cases) mimics the semantic structure of the 'degraded' sentences in (49), yet these constitutive transitives seem at the very least available by current native American English speakers given the results of the Acceptability task. Though participants were overwhelmingly more likely to pick the eventive paraphrase overall, rather than "Both", this can be attributed to the salience of the agentive reading, especially considering that the subjects of experimental stimuli were purposefully designed to have animate readings. Though further research is necessary to test the specific forms critiqued by Mourounas and Williamson (2019), based on this evidence, it is predicted that unambiguous constitutive transitive sentences will be marked as generally acceptable by current native American English speakers. As such, I take these results, and their hypothesized implications, as an argument against the assumptions of Mourounas and Williamson (2019), therefore this dissertation suggests that any comprehensive aspectual verb theory should have a linguistic account for such forms.

3.5 Summary

This chapter has presented novel empirical evidence in the form of three constructions (*x began, x began with y,* and *z began x with y*) which are either not considered or not adequately accounted for by prior theories. These constructions have been shown to pose significant challenges to the SIH in particular as it limits itself to a two-argument predicate structure for the denotational basis of aspectual verb composition, thereby making false predictions as to the composition of other variable forms.

Also presented here is novel experimental evidence from an offline study supporting the acceptability, and thereby theoretical consideration, of the constitutive transitive construction. This evidence is presented as an argument against the critiques given by Mourounas and Williamson (2019), who claim that such examples are unacceptable to native English speakers, or only evident in archaic forms. However, the results of the acceptability study discussed here suggest otherwise, implying the acceptability of the constitutive reading in the transitive form. These results also show that specific grammatical contexts, namely Mental Attitude adverbs, may manipulate the availability of such constitutive readings.

In the following chapter, possible theoretical avenues to account for the varied empirical data, primarily concerning the bare intransitive asymmetry, will be reviewed and ultimately debunked. The selectivity patterns shown in the bare intransitive are further analyzed by relying on external (anti-)causative literature, which provides an underlying perspective for the theory promoted here. This is then followed by a proposal laying out theoretical ingredients argued to be necessarily adopted in future theories.

CHAPTER 4

EXPLORING THEORETICAL POSSIBILITIES: SUPPORTING A MONADIC ACCOUNT

4.1 Introduction

This chapter seeks to explore and analyze possible expansions of the SIH specifically given the empirical and theoretical challenges it now faces. In particular, a primary goal of this chapter is to reiterate these challenges and consider a possible SIH theory-preserving analysis for the reviewed selective bare intransitive data. This possible analysis relies on the idea that the complement's dimensional function is left underspecified in the absence of context, as can be argued for the case of certain bare intransitives, thereby resulting in an unacceptable reading. Thus, this theory is tested via the contextual manipulation of the predicate, ultimately showing that only the contexts that necessarily coerce the entity noun into an event denoting nominal may result in an acceptable reading.

As part of this analysis, the theoretical basis of aspectual verbs' lexical argument structure is examined through the lens of previous (anti-)causative alternation literature, finally pointing to a monadic approach to their semantic argument makeup. This poses implications for a comprehensive theory, as it challenges the basic dyadic approach of the SIH and further assumes a non-derivational link between the intransitive and transitive constructions.

4.2 The Main Data: Potential Analysis

The following examples reiterate the main data to be accounted for here:

(53)   Lia began the fight. ⟹ *Lia caused the fight to begin*

    a. The fight began.

    b. The fight begins with Lia.

(54)   Lia began the book. ⇏ *Lia caused the book to begin*

    a. *The book began.

    b. The book begins with Lia.

As a review, these examples show aspectual verb transitivity alternations with an event and entity denoting complement, respectively. In a bare intransitive, aspectual verbs seem to exhibit restrictions on their internal argument, only allowing an event denoting complement. However, if a subpart argument is provided, e.g. in a constitutive *with* phrase, this results in an acceptable stative constitutive reading.

The challenge that the SIH faces with regard to this data is that it in principle requires for aspectual verb composition that the complement be an SI which can fall along some contextually determined dimension via function applications. The examples above contain the complements *book* and *fight*, which both fall under the definition of an SI whose axes can fall along some dimension (as evident by the transitive and constitutive *with* constructions above). The fact that the bare intransitive shows an asymmetry between event/entity complement types, however, poses a challenge to this idea. Further, the acceptability given the addition of an argument within the constitutive *with* phrase sheds more light on the underlying compositional process at play here, which any comprehensive theory should be able to account for.

One possible avenue to account for this data could call for an entirely new theory that argues against the SIH, one that implies the necessity of the event/entity complement type distinction. Given the patterns in (53)-(54), such a theory may suggest that aspectual verbs must take in an event argument in their intransitive form, as proposed in Chapter 6. However, if we are to lend a charitable analysis to the SIH, Piñango and Deo (2016) could have an out in relying on another perspective that may preserve their theory despite this apparent asymmetry.

For instance, it could be argued that the infelicity of the bare intransitive with an entity noun (as in 54a) comes from the lack of a suitable contextually provided dimension for the SI complement to be interpreted along. If no salient mapping function is picked out, the resulting underspecification of the functional interpretation in context could result in an unacceptable reading. Regarding the example in (53a), the relevant dimension for the SI complement *fight* to fall along can be said to be specified within the lexical qualia structure of the event nominal, resulting in the reading being temporal/eventive (though non-agentive). In (54a), however, no such specification can be found

within the qualia structure of the complement *book*, as it has no specified salient event it is associated with. In the transitive eventive construction (54), the salient event (*reading/writing*) is somehow extrapolated from the predicate context (and can be manipulated via external linguistic context), but perhaps it remains unspecified in the intransitive without the context any other predicate arguments. Given this lack of contextual information to indicate a clear construal of the complement, it could be said that no function can be deemed adequate, thus none is picked out and the result is unacceptable.

Therefore, it seems that only in the transitive construction or with the addition of a constitutive *with* phrase (54b), which supplies a subpart argument, is there enough context to effectively determine the specific dimension on which the complement axis can be construed. If this is the case, however, and the primary reasoning for the unacceptability in (54a) is a lack of appropriate dimension-biasing context, then it should be possible to make such an example acceptable with sufficient contextual information.

Before we can conduct tests for this kind of context, though, it is first crucial to reconsider the internal argument structure of aspectual verbs given the varied argument structures presented here as this will determine the specific compositional processes that context may manipulate. Given that the SIH does not incorporate the intransitive form into its semantics, it has no predictions as to this construction's internal argument structure. As such, it gives no account for aspectual verb predicates where no subpart or agent argument is entered into the composition. As this theory's verbal semantics has aspectual verbs take in one individual that is mapped to some privileged subpart of the whole and one whose part structure is mapped along a dimension, then on this account, a bare intransitive predicate should result in either an unclosed partial function or in an unavailable reading, both of which are wholly unacceptable. As neither is the case and instances like (53a) are possible with no other context, a modified account is required to explain this unique compositional process.

Without modification, the SIH itself provides a *dyadic* approach to the internal argument structure of aspectual verbs which defines them as lexically encoded to take in two arguments. This is opposed to a *monadic* approach, which defines verbs as lexically encoding only one argument.

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With this novel data in mind, it is crucial to determine the fundamental underlying argument structure of aspectual verbs as it holds consequences for the theoretical basis of any comprehensive theory.

In determining whether aspectual verbs are indeed dyadic or monadic, given that their alternations have been shown to mirror those of (anti-)causative verbs, it is useful to contextualize this analysis within the wealth of literature around the possible derivational patterns of typical (anti-)causative alternations. Discussed here are two contrasting semantic accounts argued for in this literature, the first of which I call the *Dyadic Derivational* account synthesized from Reinhart (2002) and Levin et al. (1995), and the second of which I call the *Monadic Non-Derivational* account synthesized from Hovav and Levin (2012) and Hovav (2014).[1] In what follows, empirical evidence for both accounts is reviewed and analyzed, ultimately supporting a monadic approach to alternating verbs.

4.3 Linking to (Anti-)causative Accounts

Before reviewing the main accounts for causative alternations, let us first run through the myriad of linguistic asymmetries alternating verbs exhibit that such theories must account for. While many of these verbs seem to freely alternate between anticausative and causative constructions (see Chapter 3 for basic examples), Hovav (2014) notes that some of these alternations are constrained in unique ways. Firstly, there exist verbs that in theory should alternate based on their semantic type, but do not; there are those which do not alternate out of their transitive forms, containing multiple English verbs of killing or destruction as in (55), but there are also those which seem to show restrictions on the theme argument in either the transitive causative (56)-(58), or in the intransitive anticausative (59)-(61).

(55)　　a.　*The city destroyed.

　　　　b.　*The building demolished.

　　　　c.　*All the chickens killed.

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[1]Though there may be others who follow these lines of theory, I take these respective authors to be representatives of these two contrasting accounts.

(56) a. Her face narrows under her cheekbones.

      b. ??Her bone structure narrows her face under her cheekbones.

(57) a. As the days lengthened into weeks, their food and water was almost gone.

      b. ??As the wait lengthened the days into weeks...

(58) a. The flowers bloomed.

      b. *John bloomed the flowers.

(59) a. I cleared the screen.

      b. The screen cleared.

(60) a. The waiter cleared the counter.

      b. *The counter cleared.

(61) a. John broke his promise.

      b. *His promise broke.

The theories given to account for this data attempt to give an analysis based on either the lexical nature of the verbs themselves or the semantic roles of their arguments. Note that these patterns, especially those exhibited in (59)-(61), seem reminiscent of the asymmetries noted in intransitive aspectual verb constructions, with possible limitations on the theme specifically. Application of prior (anti-)causation theories to the aspectual verb cases will be considered in section 4.3.3, ultimately pointing to the necessity of a more complex approach to account for such data.

4.3.1 Dyadic Derivational Account

The first of the accounts to be reviewed here, the Dyadic Derivational Account (DDA), as argued by Reinhart (2002) and Levin et al. (1995) (though with notable differences between them), claims that alternating verbs are lexically dyadic and that the intransitive anticausative variant is derived from the removal or non-expression of the external cause argument in the transitive causative. The dyadic account given by Levin et al. (1995) relies on a distinction between verbs that are said to express *internally caused* (IC) eventualities and those that express *externally caused* (EC)

eventualities. They claim that a one-place verb describes an internally caused eventuality if "some property inherent to the argument of the verb is 'responsible' for bringing about the eventuality." It describes an externally caused eventuality if there is no such property and the cause must come externally.

Thus, Levin et al. (1995) divides (anti-)causative verbs into these different verb event types (IC and EC events), relating it to their different internal argument structures. Verbs which express IC events are said to be lexically monadic, selecting only the internal argument undergoing some change of state. Verbs which express EC events are said to be lexically dyadic, selecting the internal argument as well as an external cause argument. Thus, IC verbs, assumed to be those in (56)-(58), have anticausative forms, but do not show a transitive variant, whereas EC verbs like those in (55) and (59)-(61) do have transitive forms.

The variation observed between the EC verbs, as shown between (59) and (60), is thought to come from whether they encode some specification about their cause argument, restricting it to e.g. an agent, event, force, etc. For example, verbs like *murder, destroy, demolish*, and *kill* specify something about the causer (intentionality), thus they must appear with the external argument and, as a result, cannot have an anticausative variant and are non-alternating. Levin et al. (1995) further claims that if the verb expresses an EC event but can alternate, it falls within a subset of EC verbs that do **not** specify anything about their cause argument, only the nature of the change of state in the theme. In this case, the verb is said to undergo a process of *lexical binding*, a kind of existential quantification of the external cause argument within the lexical semantic representation, preventing it from being expressed syntactically, thereby resulting in the anticausative variant. Thus, on this account, what characterizes the class of alternating verbs is the complete underspecification of their cause argument.

As support for this, *break* and *clear* are considered EC verbs which do not specify anything about their cause argument, only that it must be a causer, thus their alternation is possible. Because of this underspecification, this theory predicts that any cause should be acceptable with these verbs, as illustrated below in (62) and (63) with causers reflecting a natural force, agent, or causing event.

(62)   A huge gust of wind/ the waiter/ a swipe of the arm cleared the table.

(63)   The rocks/ the hooligans/ the storm broke the window.

Reinhart (2002) does not follow the IC/EC distinction, but agrees that (anti-)causative alternating verbs are indeed dyadic. She takes this data to motivate an unspecified cause feature [+c] on alternating verbs along with a theme argument which is assigned the non-causative, non-agentive feature [-c, -m(ental state)]. To derive the anticausative, she proposes a *decausativation* process where the [+c] feature is reduced, resulting in the lack of expression of the external cause argument. To account for the deviant cases in (59)-(61), Levin et al. (1995) claims that the set of possible subjects for the anticausative is a subset of the possible objects of the transitive, which they take as support for a transitive derivational basis.

4.3.1.1   Problems with the Dyadic Derivational Account

As support for the competing analysis given in Hovav and Levin (2012) and Hovav (2014), they show that the DDA results in false predictions about alternating verb distributions. The account given in Levin et al. (1995) claims that IC verbs should not be able to alternate, yet, for specific subjects, the transitive is indeed allowed, as shown with typical IC verbs *grow* (64) and *bloom* (65). In (64), *grow* appears to only specify an agent as an acceptable causer, whereas *bloom* in (65) does not, instead specifying its acceptable cause as an ambient condition (or natural force).[2]

(64)   a. John grew the tomatoes.

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[2]Hovav (2014) gives further evidence of this restricted alternation with IC verbs by mentioning change of state verbs which are thought to describe the change in the value of an attribute of an entity over some spatial axis, rather than over time. This set of verbs contains mainly deadjectival change of state verbs like *deepen, narrow*, and *widen*. She shows that these cases, too, may selectively appear in the transitive, which she aligns with the causative variant. However, as the intransitive variants result in a stative reading, rather than an eventive one as in typical anticausatives, and as they are often followed by adverbials, I suggest that these actually pattern more so with dispositional middle constructions, and thus do not reflect the same puzzle as in (64) and (65).

1.   a) The water deepens quickly.

      b) ?An underwater sinkhole deepened the water quickly.

2.   a) The skirt narrows at the bottom.

      b) The band narrows the skirt.

3.   a) The street widened a bit.

      b) The construction widened the street.

b. *Fertile soil grew the tomatoes.

(65) a. *The farmer bloomed the flowers.

b. The warm spring sun bloomed the flowers.

This data poses issues for both analyses discussed within the DDA; firstly, this shows that IC verbs may indeed alternate for a restricted set of cause arguments, against the predictions of Levin et al. (1995), and secondly, there exist some restrictions on the cause argument, indicating that alternating verbs do not always leave their cause argument unspecified, against the predictions of Reinhart (2002). In their review, Hovav and Levin (2012) also note that the theme does not solely determine the availability of the anticausative, as shown in the distinction between (66a), where the anticausative variant is unavailable, and (66b), where the anticausative is now available despite the theme and verb being held consistent.

(66) The waiter cleared the counter (of dishes).

a. *The counter cleared (of dishes).

b. The counter quickly cleared of people.

This shows that the verb *clear* simultaneously allows and disallows an anticausative variant with the same theme argument, *the counter*, depending on the surrounding context. Hovav and Levin (2012) and Hovav (2014) take this to indicate that the constraints on these alternations do not seem to be lexical, as argued in the DDA, but should instead be analyzed non-lexically. From this, they claim that that a proper analysis of alternation patterns comes from the specification of the conditions under which the cause argument can appear, thus they assume that alternating verbs are lexically monadic, where the transitive variant is achieved, crucially, non-lexically and via non-derivational means.

4.3.2 Monadic Non-Derivational Account

In this Monadic Non-Derivational Account (MNDA), Hovav (2014), adapting Hovav and Levin (2012), does not rely on the lexical distinction between EC and IC events to account for (anti-)causative alternations, but instead considers them to be generic properties of the event description

and not determined by the verb itself. Rather, she draws a separate three-way distinction between verb types to account for the patterns detailed above; (i) verbs like *murder*, which specify something about the external cause and are thus lexically associated with an external causal argument which cannot be omitted, (ii) verbs like *kill*, which specify nothing about the nature of the causing event, but are none-the-less associated with a cause argument which also cannot be omitted, and (iii) alternating verbs, which are only lexically associated with the internal argument. Thus, alternating verbs are the only ones in this set that are considered lexically monadic. In explaining the non-lexical mechanism which governs the nature and presence of the cause argument for monadic alternating verbs, she follows Hovav and Levin (2012) in their proposal of a non-lexical pragmatic rule of *direct causation*, rooted in discourse principles, as detailed below.

(67)   Direct Causation Condition: A single argument verb may be expressed in a clause with a transitive verb if the subject represents a direct cause of the event expressed by the verb and its argument.

Hovav and Levin (2012)

This is specified in Wolff (2013) as being "present between the causer and the final causee in a causal chain if (i) there are no intermediate entities at the same level of granularity as either the initial or final cause or (ii) any intermediate entities that are present can be construed as an enabling condition rather than an intervening cause." As different entities may be construed as direct causers for different kinds of changes of state, restrictions in alternations may arise depending on both the change of state expressed by the verb as well as the cause argument itself, whether denoting an ambient condition, natural force, event, or agent as a possible causer along a causal chain.

Thus, to account for examples like (59)-(61), where the intransitive is not acceptable with certain themes, Hovav (2014) appeals to Gricean discourse maxims (Grice 1975) in that, if there is a causer which is relevant to the change of state, it is more informative to use the transitive causative form which explicitly realizes it. She shows that the anticausative variant is acceptable if (i) the cause is somehow recoverable in context, or (ii) the speaker does not know the cause.

Determining which of these theories provides a fully sufficient and explanatory account for all crosslinguistic (anti-)causative alternations is not the main task of this dissertation. Rather, in the endeavor to understand the unique data posed by aspectual verb (anti-)causative alternations, we can use the advancements made within this sub-field to see how one may inform the other. As there are notable mis-generalizations in the Dyadic Derivational Account, this dissertation promotes the Monadic Non-Derivational Account in assuming that typical change of state alternating verbs are considered lexically monadic, selecting only the internal argument which undergoes the change of state.

Given that aspectual verbs have been shown here to pattern with alternating (anti-)causative verbs, it follows that the theory proposed here considers them to be similarly lexically monadic. It is further assumed that there is a non-derivational link between the intransitive and the transitive variants, meaning that the alternation does not result from a suppression (or lack thereof) of an external argument. The intransitive stands as the base form of aspectual verbs, thus additional meanings accessed in the transitive may potentially be derived from external mechanisms. This theoretical expansion provides a new lens into aspectual verb behavior and composition.

4.3.3 Applying Theories of (Anti-)causative Alternations

Assuming the MNDA for alternating verbs, let us now revisit the asymmetrical selectivity apparent in bare intransitive aspectual verb sentences, as is evident in (53a) and (54a), repeated here for ease in (68) and (69).

(68) The fight began.

(69) *The book began.

As noted, the asymmetry present between these examples seems similar to the behavior of (anti-)causative verbs with theme restrictions, like (59)-(61). It is thus worthwhile to apply the MNDA's pragmatic analysis for these examples to the case of aspectual verbs.

On the surface, both (68) and (69) seem to reflect the anticausative variant of an (anti-)causative alternation. Indeed, in the transitive counterpart to (68), *Lia began the fight*, *Lia* expresses an

agentive cause argument, resulting in a causative reading where Lia *caused* the fight to begin, e.g. by throwing the first punch. If we are applying the MNDA, the verb is only associated with its internal argument (in this case, *fight*), and the unspecified cause argument may only be explicitly realized if it (i) reflects direct causation and (ii) is strictly more informative about the event expressed by the verb than if the sentence was uttered without it. In this case, it is Lia's action that directly causes the fight to begin, with no other intervening causer along the causal chain from her throwing the fist to the fight event initiating. Therefore, the Direct Causation Condition seems to be sufficient to account for why a cause argument may be realized within this predicate, allowing for a transitive variant.

It seems intuitive to apply this same logic to the case in (69), however, upon closer inspection, this intransitive form, though realizing the same verb (*begin*), is actually not acting as a typical anticausative. Consider again the meaning of the transitive variant with an agent, *Lia began the book*; in this case, there is some event associated with the theme that is necessarily extrapolated from context, namely *reading/writing*, resulting in the complex predicate interpretation where *Lia began reading/writing the book*. In the case of (69), though, no such event can be interpreted. Compare this to the intransitive (68) along with its transitive counterpart (*Lia began the fight*), where in both cases the relevant event can be extrapolated from the nominal itself. This points to a compositional difference between aspectual verb intransitives with an entity denoting complement compared to those with an event denoting complement; the latter can access the relevant event modified by the aspectual verb from the complement nominal itself, while the former must access it in context.

This poses a complication in the compositional process of sentences like (69) as the event taken in by the verb may manifest as a non-causative non-alternating activity verb, namely *read*. As this verb is lexically required to encode an agent (evident from the unacceptability of **The book read*, and acceptability of *Lia read*), it follows that the anticausative in (69) is likewise unacceptable. Thus, due to the complex nature of aspectual verbs themselves, the unacceptability of certain themes in the anticausative cannot be solely accounted for by the pragmatic non-lexical principles

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of causation relied on by Hovav and Levin (2012) and Hovav (2014), but can be said to instead be due to the nature of the interpreted verb in agentive aspectual verb sentences with an entity complement, restricting any underlying causative structure.

In sum, applying previous theories of (anti-)causative verb alternations can help to account for some of the varied semantic behaviors exhibited by aspectual verbs thus unaccounted for by prevalent theories like the SIH. This dissertation supports the MNDA for alternating verbs, which motivates a non-lexical pragmatic process for achieving the alternation, and extends such an account to aspectual verbs. This indicates that it is not a process of decausativation, nor a derivation from the transitive that results in the anticausative variant, but rather, that the base lexical representation for such verbs is the intransitive anticausative. However, though this account cannot explain the asymmetry exhibited in aspectual verb bare intransitives, it highlights the optionality of any (anti-)causative structure within such predicates depending on the interpreted activity verb, which may indeed align with the non-lexical MNDA. Regardless, this theory application allows us to observe the context effects on the intransitive aspectual verb form given this perspective of the lexical representation of its argument structure.

This theoretical analysis further indicates additional challenges to the SIH's over-generalized account for aspectual verb selection and compositional processes, once again revolving around the distinction between event and entity denoting complements. In the following section, which revisits and tests the possible underspecification argument discussed earlier in this chapter, the necessity for the distinction between complement types is further supported, indicating directions for a more refined account.

4.4   Testing Context Manipulation

Now, we may return to considering and testing the predictions of the proposed SIH-preserving account for the unacceptability in (69), which claims that a lack of appropriate dimension-biasing context results in the underspecification of an appropriate dimension for the complement axis to fall along. This section attempts to test sufficient contextual information which should, in theory, allow for constructions like (69) to be acceptable.

Although Hovav (2014) claims that a cause may be recoverable in context in the anticausative intransitive variant, given that these forms have been independently shown here to encode no implicit external argument and also encode no underlying causation, this recovery is not deemed possible here. As such, no context which attempts to bias to a causative reading is predicted to make the bare intransitive with an entity complement acceptable.

Additionally, it is predicted that no bare intransitive construction can be biased to a constitutive dimension given that, even if a subpart argument is provided in the preceding context, it cannot be accessed or reflected implicitly in the intransitive. This follows the compositional functions given in the SIH, which indicate that constitutive readings, intuitively, require both the whole (SI) argument and some subpart argument to be entered into functional mapping to each other along a specific dimension. As the intransitive encodes no external argument and only realizes the internal theme, no object is entered into the subpart mapping function and thus no constitutive reading can be accessed. As such, if the context biases the complement into a specific metonymic reading ((Utt et al. 2013)) in order to make it fall along a constitutive dimension, it is likewise unacceptable, as shown in (70)-(72) with a variety of entity denoting complements. These bare intransitive examples are then paired with an additional constitutive *with* phrase, which may explicitly introduce the subpart argument. In this case, or the typical stative transitives, the readings are acceptable.

(70)   Context: *Many poems are started with a quote that is important to understand the rest of the piece. Lia is a famous poet who likes to use this method.*

   a.   *The/her poem began.

   b.   The/her poem began/begins with a quote.

   c.   A quote begins the poem.

(71)   Context: *Trails are often marked by signs to indicate the starting and ending points for trail-goers.*

   a.   *The trail began.

   b.   The trail began/begins with this sign.

    c. This sign begins the trail.

(72) Context: *Lia is writing a list of friends' names to invite to her wedding. She is ordering them based on importance.*

    a. *The list began.

    b. The list began with the most important name.

    c. The most important name began the list.

Regardless of context, only in the cases where a subpart is explicitly realized is the intransitive acceptable and a constitutive reading is accessible. Thus, we must restrict our context manipulation to contexts which bias to a non-constitutive reading, i.e. an agentive reading. The intention for these contexts is to bias the reading of the predicate to one which interprets the entity complement along an eventive dimension. To reiterate, the eventive dimension is automatically accessible in sentences like (68) due to the lexical nature of the complement as an event denoting noun. It may then be the case that if a relevant event associated with the theme entity of an aspectual verb is provided in the preceding linguistic context, then it should be accessible by the bare intransitive.The following examples create two different contexts which may manipulate the entity complement *poem* in this way, highlighting a distinction in acceptability.

(73) Context 1: *Lia is a terrible procrastinator. She was assigned a poem to read for class but has been putting it off all week. Finally, her friend gave her some motivation, and by Sunday...*

    a. *The poem began.

    b. Lia began the poem.

(74) Context 2: *Lia is a famous poet and has been invited to read one of her poems aloud in a local library. When she walked up to the mic, the room fell silent and....*

    a. The poem began.

    b. Lia began the poem.

In each of the above examples, the contexts provide a relevant event (*reading*) for the aspectual verb to modify and a possible agent for that event (*Lia*), however, only in the latter context is the bare intransitive acceptable. The distinction between these lies in the semantic interpretation of the complement *poem* due to the nature of the contextually provided event. While each context provides a reading event, they differ in that the context in (73) denotes an individual reading (by Lia with no intended audience) event of the poem whereas the context in (74) denotes a poem-reading (by Lia to an intended audience) event. As such, the latter context, as opposed to the former, accesses a metonymic interpretation of the complement *poem* as an eventive object, which may be rephrased as a gerundive event nominal (see Heyvaert 2008), as in *the reading of the poem*. Such nouns behave similarly to typical event nominals (or deverbal nouns) like *fight, performance, presentation*, etc. which denote some temporal eventive object. This is evident by the possibility of aspectual modification of such nouns, positioning themselves within a temporal reference point, which is otherwise unacceptable with the preserved entity interpretation in (73).

(75) The fight/presentation/performance happened at 12 pm.

(76) Context 1: *Lia's reading of the poem happened at 12 pm.

(77) Context 2: Lia's reading of the poem happened at 12 pm.

The context in (73), comparatively, only provides a possible event associated with the entity noun, but does not necessarily coerce it into an eventive object, as seemingly necessary for interpretation of the the bare intransitive. This data indicates that while context *can* be manipulated to make the bare intransitive with an entity noun acceptable, this is only possible in the case that the noun explicitly reflects an eventive meaning. Otherwise, if the complement remains in its base entity interpretation, even if an event is provided, the bare intransitive is not acceptable. This data once again indicates a distinction between aspectual verb composition with entity denoting nouns and event denoting ones, whether derived or not. This pervasive pattern between acceptable complement types is ultimately taken as motivation to re-approach the intuitive event/entity distinction initially assumed in type-shifting literature and intentionally challenged by the generality

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of the SIH. As this dissertation motivates a monadic account for aspectual verbs' lexical argument structure, the base form of aspectual verbs is assumed to be the intransitive. As such, this set of intransitive data undoubtedly points to a theory which assumes that aspectual verbs lexically specify their complement as an event. Therefore, the overly general account given by the SIH, which dissolves such a distinction, is not alone sufficient to describe such distributional properties and indeed sets up incorrect predictions as to the acceptability of different complement types.

In the following chapter, I provide and investigate varying possible theories to account for this complex set of verbal behaviors. Some of these are considered within the framework of the SIH, whereas others argue against it. As will be shown, each account given can be ruled out either on the basis that it cannot accurately deal with the selective bare intransitive or that it must incorporate stipulative ad hoc reasoning.

CHAPTER 5

INVESTIGATING AND REFUTING THEORETICAL ADAPTATIONS

5.1 Introduction

This chapter provides five possible theoretical avenues that one could consider to account for the complex aspectual verb behaviors discussed thus far. The aforementioned challenge between a type-specific and type-flexible account will also appear in this analysis. As will be shown, neither the SIH, the account given by Mourounas and Williamson (2019), nor intuitively motivated adaptations of either are sufficient to predict the selectivity in the transitivity alternations of aspectual verbs. However, the successes of these previous accounts are highlighted throughout, setting up a discussion of a set of well-supported theoretical building blocks to be adopted into the following proposal.

5.2 Exploring Expansions

5.2.1 A Complex Lexicon

Based on the data illustrated throughout this dissertation, a crucial consideration for any comprehensive aspectual verb theory should be the semantic composition of the intransitive construction. As discussed in the previous chapter, this dissertation motivates a monadic account for aspectual verbs' lexical argument structure, meaning that its base semantic form is intransitive, lexically encoding only its internal argument. Couched within this idea, on a cursory glance at the main puzzling data of aspectual verb transitivity alternations presented here, it may appear that aspectual verbs simply specify their internal argument as event denoting. Complexities arise however when considering that the verb allows for non-eventive complements, but only when a subpart argument is realized or an event is recoverable from the context of another thematic participant.

Let us first consider the simplest possible explanation for this data. It may seem intuitive to account for this distinction by instantiating two separate lexical entries for a given aspectual verb, one which takes an event as its internal argument and one which takes an entity as well as some subpart of that entity. Though separate denotations may be able to account for the differing behavior between aspectual verb composition with eventive and non-eventive complements, and may indeed

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align with cross-linguistic distinctions, this poses significant theoretical and conceptual issues.

There is substantial reasoning to reject the idea of adding complexity to the lexicon in order to accommodate this pattern, primarily on the basis that, while the lexicon can be considered the locus of variation, it should not be considered a catch-all for irregularities or ambiguities in e.g. verb distributions. Rather than adding additional and separate lexical entries for related verb forms, such irregularities can be captured by rule. Reinhart (2002) makes this intuition explicit in what she calls the Lexicon Uniformity Principle, as supported in Hovav and Levin (2012) and Hovav (2014), and assumed here:

(78)   Lexicon Uniformity Principle: Each verb-concept corresponds to one thematic structure. That is, the various thematic forms of a given verb are derived by arity [transitivity alternation] operations from one thematic structure.

Reinhart (2002)

Further, as implied by this principle, to instantiate that aspectual verbs have multiple distinct lexical entries dependent on their specified argument ignores the related meaning senses across event and entity complement constructions. In either case, the aspectual verb picks out some relevant subpart of the structured whole theme, whether that be of an event or entity. Presumably, it is for these reasons that previous accounts from Piñango and Deo (2016) and Mourounas and Williamson (2019) assume a single lexical entry for aspectual verbs across complement types, despite distinctions cross-linguistically. Additionally, given the complex three-argument structure discussed here of the form *z began x with y,* where the complement seems to be interpreted as both relating to some event as well as a constitutive SI, it is evident that a simplification of the verbal denotation cannot predict such meanings. For this set of reasoning, regardless of their realized argument structure, aspectual verb behavior should be accounted for by a singular lexical denotation. Therefore, this theoretical avenue will not pan out.

5.2.2   Preserving SI-Selection

Let us now continue with a possible account based on a singular lexical denotation for aspectual verbs across their transitivity alternations and their stative and dynamic readings. Firstly, it should

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be made clear that the theoretical claims of the SIH should not at all be ignored for the sake of a new theory; specifically, the motivations for a structured individual argument are indeed sound beyond the challenge of the empirical evidence brought forth here. It does seem accurate to limit acceptable complements of aspectual verbs to those which follow a specified one-dimensional structural makeup, as it is unclear how a complement which on its entity reading does not fall into this definition may be modified to express a beginning/medial/ending part, such as *pizza, light, arcade*, etc. If such a complement is entered into an aspectual verb predicate, the meaning must reflect an associated event where that complement is a theme. This is indeed in line with the predictions of the SIH as only in this case is there any argument which may be considered an SI, namely, some extrapolated event argument. As no nominalized or derived event is denoted by such complements, this is predicted to only ever be possible in the agentive transitive (as shown in (79)-(81)).

(79) a. Lia began/continued/finished the pizza. *eating, baking, preparing*

b. *The pizza began/continued/finished.

(80) a. Lia began/continued/finished the light. *conducting, fixing*

b. *The light began/continued/finished.

(81) a. Lia began/continued/finished the arcade. *playing in, building*

b. *The arcade began/continued/finished.

Indeed, a constitutive reading is nearly impossible for such entities, even in the case that a contextually relevant part is entered into the composition. Consider, for example, *A pepperoni began the pizza*, which cannot be taken to mean that the pepperoni, a typical pizza part, constituted some initial part of the pizza unless the pizza is construed linearly somehow, resulting in a reading that is at best highly marked.

With this in mind, it may seem reasonable to preserve the idea of an SI argument within aspectual verb composition. Similarly, for the sake of this exercise, the idea of contextually

dependent dimensional functions will likewise be maintained in aspectual verb denotations. Below reflects a possible intransitive denotation for aspectual verbs preserving these two concepts.

(82) **Intransitive *begin*** (potential proposal)

    a. $[[begin]] = \lambda x_\tau : \textbf{struct-ind}_{f_c}(x).\exists f'\exists y[f'(y) <_{small\text{-}init} f_c(x)]$

    b. *Begin*(x) is defined iff x is a structured individual with respect to the contextually determined function f_c. If defined, *begin*(x) is true iff there is some function f' (possibly identical to f) and some y such that $f'(y)$ is a "small" initial subpart of the axis $f_c(x)$.

This denotation maintains the SIH's lexical presupposition that the aspectual verb *begin* takes in an internal SI argument. The external argument (whether a subpart or thematic agent) undergoes existential closure, resulting in a reading where there exists some initial subpart that serves as the beginning of the SI whole along some contextually derived dimension, which is specifically non-agentive. This seems to capture a basic aspect of the meaning of acceptable event complements in the bare intransitive, and allows for constitutive *with* constructions with the explicit realization of the subpart argument (y).

However, as has been discussed, the use of the SI argument to generalize across complement types ends up making the wrong predictions for entity denoting complements in the bare intransitive, as this denotation predicts that such examples should be acceptable given that their complements can be defined as SIs. In that case, for the sentence *The book began*, the intended meaning would be that there exists some beginning subpart of the book, which falls along some contextually determined dimension, however, no such trivial reading is interpretable, nor is any eventive reading.

One might try to explain the unacceptability of this example in terms of it having trivial truth conditions (Gajewski 2002). Specifically, it seems to reflect a tautology given that the book, whose existence is presupposed, necessarily has a beginning, hence the triviality of the statement. However, the sentence *The book has a beginning* is wholly grammatical and acceptable, unlike *The book begins/began*. Though it's possible that a suitable theory of triviality-based unacceptability (à la Gajewski) may distinguish the two sentences, in the absence of such a theory, this is taken here as further indication that this phenomenon results from a compositional issue.

In sum, while an SI argument is theoretically well-motivated and can capture many of the different meaning senses regarding aspectual verb composition, it is shown to overgeneralize in the context of the intransitive data. This indicates that a more comprehensive theory must assume some less general and more specified complement selection process, potentially one that preserves the entity/event distinction between complement types.

5.2.3 Functional Selectivity

Another possible theoretical avenue that preserves a fundamental aspect of the SIH assumes that the selectivity between complement types is determined by the availability (or lack thereof) of dimensional functions. On this account, one could claim that the eventive dimensional function is accessible with or without an external argument, allowing for existential closure of this argument in the intransitive, whereas constitutive dimensional functions require an external subpart argument within the verbal semantics, unable to undergo existential closure. This would indicate distinct compositional processes for the eventive dimension readings compared to constitutive dimension readings, beyond those already imposed by the SIH in the form of inverse thematic functions.

While this may indeed account for the complement selectivity in the intransitive and lack thereof in the transitive, it is unclear on what theoretical grounds this should be implemented into the compositional process beyond the preservation of an aspect of the SIH. This kind of instantiation seems a stipulative ad hoc solution to fit the pre-existing theory to the data. As such, neither this nor the prior attempts given in this section to account for this data via intuitive considerations can accurately predict the patterns exhibited in the intransitive. In what follows, moving beyond the SIH, the competing account given in Mourounas and Williamson (2019) is discussed and tested with regard to the puzzling intransitive data, though is likewise proven to be insufficient.

5.2.4 Sub-Domain Selectivity

Contrary to the SIH, the account given in Mourounas and Williamson (2019) assumes that aspectual verbs are type-specific in their complement selection, restricted to only an event. Their account similarly motivates a single lexical entry for aspectual verbs across multiple syntactic complements, including finite and infinitival phrases. They first formalize a working denotation

for the aspectual verb *begin* by assuming its type to be $\langle v, vt \rangle$, taking in an event argument and resulting in a predicate of events. Like Piñango and Deo (2016), their account relies on a theory of mereology, resulting in the following denotation.

(83) $[[begin]] = \lambda e'.\lambda e. \; e <_{initial} e'$

where e $<_{initial}$ e' iff e $<$ e' $\wedge$ $\forall$e'' [e'' $\leq$ e' $\wedge \neg$ (e o e'') $\rightarrow \tau$(e) $< \tau$(e'')]

   a. A relation between an initial sub-event *e* and the complement event *e'* holds iff *e* is a sub-part of *e'*, and for any other sub-part *e''* of *e'* which has no overlap with *e*, the runtime of *e* precedes the runtime of *e''*.

<div align="right">Mourounas and Williamson (2019)</div>

As they initially claim that compatible event denoting complements are of type *v*, they easily combine with an aspectual verb via function application. However, they later contextualize their theory within the stative observations made in Piñango and Deo (2016). In order to extend their analysis to capture non-eventive cases, rather than adopting the notion of a *structured individual* as an unspecified general argument, they instead assume that "events and entities form sorted sub-domains of a single domain D_e (Elliott 2016; Lasersohn 1995)." As such, they revise their denotation to the following.

(84) $[[begin]] = \lambda y.\lambda x. \; x <_{initial} y$

where x $<_{initial}$ y iff x $<$ y $\wedge$ $\forall$z [z $\leq$ y $\wedge \neg$ (x o z) $\rightarrow$ f(z) $<$ f(x)]

   a. A relation between an initial sub-part *x* and the complement *y* holds iff *x* is a sub-part of *y*, and for any other sub-part *z* of *y* which has no overlap with *x*, *x* precedes *z*.

<div align="right">Adapted from Mourounas and Williamson (2019)</div>

Similar to the dimensional function in context from the denotation given in Piñango and Deo (2016), Mourounas and Williamson (2019) encode within this denotation a function *f* which represents some relevant function that serves to map a subpart to a whole. The result is a denotation that is intended to similarly account for the range of semantic arguments aspectual verbs may take. However, although this account seems to put a preferential selection on event arguments,

it suffers the same issues faced by the SIH in accounting for the intransitive and three-argument varieties. Namely, it instantiates no formal restriction on the possible arguments taken in by aspectual verbs, thereby incorrectly predicting the unavailability of the bare intransitive with an entity denoting complement. It further cannot account for the multiple simultaneous meanings in the three-argument structure.

It does, however, introduce the formal notion of a shared domain between events and entities, which are each couched within their own subdomains. Perhaps then there is some restriction on access to the entity subdomain in the intransitive, resulting in its unavailability. However, this idea is once again easily debunked on the same basis that functional selectivity is likewise stipulative as it introduces complexity seemingly for the sake of complexity. Therefore, the account by Mourounas and Williamson (2019) necessitates further modification if it is to accurately predict such aspectual verb behaviors.

5.3 Summary

From this investigation of possible accounts for the complex aspectual verb behaviors addressed in this dissertation, neither intuitive adaptations of the SIH nor the application of previous competing accounts seem to give accurate predictions of the data. In all cases, while some behaviors may be well-accounted for, the selectivity difference between intransitives with entity denoting complements and those with event denoting ones remains a puzzle. The previous chapter further applies external (anti-)causation accounts to this data, though is similarly insufficient. This serves as a further demonstration of the semantic complexity within this set of data and aspectual verb meanings broadly.

While some aspects of the SIH and the account given by Mourounas and Williamson (2019) are by themselves well-motivated, such as the mereological framework and contextual dependencies underpinning both, neither can be intuitively modified to impose the selection restrictions necessary for this data. This data instead seems to point to a theory which delves into the event/entity type distinction while still generalizing aspectual verb meanings to their shared mereological denotations across these types.

CHAPTER 6

PROPOSAL

6.1 Introduction

This chapter aims to take stock of the theoretical and empirical considerations brought forth in this dissertation in order to identify the most prominent and well-motivated route for a new and/or modified comprehensive aspectual verb theory. In the following proposal, under the assumption of a simplified lexicon, the evidence discussed is briefly reviewed, which ultimately points to four theoretical claims about the underlying denotations of aspectual verbs. This is not intended to be a complete list, but these claims are meant to serve as foundational springboards that are argued to be necessary for future comprehensive theories in order to account for the wealth of behaviors aspectual verbs show.

6.2 Aspectual Verbs are Lexically Monadic

Firstly, this dissertation argues for an account which assumes a monadic basis for aspectual verb semantic argument structure, meaning that they fundamentally take in a singular internal argument in their base form. This is motivated by previous work within the existing literature on (anti-)causative verbs, particularly from researchers promoting what I call the Monadic Non-Derivational Account (MNDA), formed from a synthesis of Hovav (2014) and Hovav and Levin (2012). This presents challenges to previous aspectual verb accounts like the SIH, which primarily limit their compositional considerations to a transitive two-argument aspectual verb construction.

Conceptualizing aspectual verbs as lexically monadic places a stronger emphasis on the interpretation and behaviors of the intransitive form. As the bare intransitive shows an asymmetry between composition with event and entity denoting complements, only accepting the former, this indicates a change in perspective when considering aspectual verbs' core meanings. Specifically, as aspectual verbs in their base form can only modify event arguments, this suggests that they may specify their internal argument as an event, restricting composition with an entity denoting complement without further linguistic contextual aid. This poses a challenge to the overly general account given in the SIH.

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6.3   Causation is Non-Lexical and Non-Derivational

Further, the transitive aspectual verb construction typically reviewed in previous aspectual verb literature (e.g. *x began y*) can appear with or without a causative interpretation (*Lia began the fight / Lia began the book*), lending further support to the integration of these verbs into the set of alternating (anti-)causative verbs. The accessibility of this causative meaning is dependent on the verbal complement, showing that only complements which encode an event argument may alternate between an anticausative and a causative construction. This is taken as further evidence for reconsidering the event/entity distinction between complement types.

The MNDA assumes not only that typical alternating verbs are lexically monadic, but also that the transitive causative variant comes about via non-derivational and non-lexically encoded means (along the lines of Härtl 2003). Rather, it is pragmatic principles like the Direct Causation Condition that dictate the appearance or lack thereof of the causative transitive variant, though inapplicable in entity denoting complement contexts. As aspectual verbs show similar alternating patterns to typical (anti-)causatives, this dissertation similarly argues for an account that achieves the causative meaning in certain transitive aspectual verb sentences via pragmatic means.

6.4   Mereological Event Boundaries are Necessary

Thirdly, this dissertation argues that the edge boundaries of subpart arguments, particularly in event mereology, should be incorporated to apply more fine-grained formalism to account for the range of behaviors aspectual verbs show. In particular, I argue for the integration of the specificity allowed in the conceptualization of achievement verbs defended in Piñón (1997), which are said to denote instantaneous temporal boundary parts of some whole event. As he interprets aspectual verbs as falling within this set, it is crucial to consider his theoretical perspective within a comprehensive account, however, no previous prominent theory makes reference to this work. This idea further aligns with (anti-)causative accounts which conceptualize (anti-)causative verbs as expressing spontaneous changes of state.

Piñón's account, as has been shown, provides in its denotation for achievement verbs specifications on the boundaries of the events they modify, formalism missing from e.g. the overly general

denotations given in the SIH. Without such mechanisms, which define the relationships between the boundaries aspectual verbs express and the whole argument, it is not possible to account for the distinct behavior of the aspectual verb *continue* within agentive eventive constructions. As has been reviewed here, this verb may describe a kind of 'restarting' meaning (e.g. *The third act continued the movie / The movie continued with the third act*), which necessitates specification of the relationships between boundaries of internal subevents. Specifically, this meaning must reflect that *continue* picks out a subevent which necessarily touches neither the initial nor final boundaries of its sum event, but instead indicates one that follows another subevent within that sum. Further, *continue* expresses unique telicity properties compared to other aspectual verbs, being able to express both telic and atelic eventualities, whereas typical aspectual verbs are primarily telic on their eventive reading. Due to this, this dissertation supports the integration of formal boundaries in a comprehensive theory for aspectual verb behavior and composition, beyond the relatively vague notions of *initial/medial/final* subparts of the complement, as is provided in the SIH.

6.5 Aspectual Verbs Should be Considered Type-Specific

Finally, when synthesizing the empirical evidence and arguments discussed here, it is evident that the generality of the argument type that aspectual verbs take in must be reconsidered. Presented throughout this dissertation are three primary aspectual verb theories which each differ in their approach to this puzzle. The previous Type-Shifting Hypothesis, not integrating stative constitutive interpretations into the theory, supports a distinction between event and entity denoting nominals in claiming that aspectual verbs lexically specify their complement argument as an event. Under this idea, only if a coercive mechanism is applied within the composition is an entity complement allowed. In contrast, Piñango and Deo (2016), in the SIH, dissolve such a distinction to capture both the range of complements that aspectual verbs take in as well as the variety in their stative and dynamic meanings. As such, they assume a general argument type called a *structured individual* based on a specified internal mereological structure which both default events and default entities may describe. In the third account given by Mourounas and Williamson (2019), they specifically argue against this general approach and argue instead that aspectual verbs are unspecified in their

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argument, selecting within a shared overall domain containing both event and entity subdomains.

As has been shown throughout this work, however, neither of these theories can accurately account for the set of unique behaviors discussed here. Of significant importance in deciphering whether aspectual verbs are type-specific or type-flexible is the asymmetrical selectivity exhibited by the bare intransitive, where the verb may only combine with an event denoting nominal, whether derived or not. This evidence, along with the theoretical arguments for an eventive basis, cannot be ignored when constructing a comprehensive theory. However, the same may be said for the clear generality of complement types and accessible meanings in the transitive and three-argument structures. Therefore, there may not be a clear decision to be made at this point. However, for the sake of effective theory progression, this dissertation takes the stance that in order to avoid the overgeneralization the SIH suffers from, aspectual verbs should be considered as type-specific in their argument selection, ultimately selecting for an event denoting argument.

CHAPTER 7

DISCUSSION

The goals of this dissertation are reiterated as follows: (1) to provide a comprehensive review of prior aspectual verb accounts, (2) to examine the theoretical challenges to each in light of novel empirical data, (3) to link aspectual verb behavior to a monadic non-derivational non-lexical (anti-)causation account, (4) to investigate possible expansions of each prior account, and (5) to outline a set of theoretically well-motivated formal components that are argued to be necessary to incorporate in a comprehensive aspectual verb theory.

The novel empirical behaviors reviewed here primarily concern the variable argument structures aspectual verbs may appear in (e.g. *x began, x began with y, z began x, z began x with y*), expanding upon previous theories which only consider the typical transitive form (e.g. *z began x*). As has been shown, the consideration of these variable forms and the behaviors and meanings they exhibit leads to further discoveries about the nature of these verbs, prompting critiques against prior theories. A fundamental consideration supported throughout this dissertation is a critique on the over- and under-generality of the semantic account presented in Piñango and Deo (2016). Specifically, the arguments presented in 3.4, based on empirical evidence, are taken to point to the necessity of a type-specific account for aspectual verb selectional properties. An account of this kind, which specifies the basic acceptable argument for aspectual verbs as eventive, may accurately predict the asymmetrical acceptability apparent in the bare intransitive form.

This work also bridges research on aspectual verb semantics with (anti-)causation literature, noting their shared distributional patterns with typical alternating verbs. Aspectual verbs in their transitive forms are shown to optionally express a causative interpretation. They may also alternate between a causative transitive and an anticausative intransitive. However, the complements that show causative readings in the transitive, namely event denoting arguments, are the only ones that may undergo (anti-)causative alternations to appear in the intransitive, which can be said to diverge from the typical anticausative form. This integration sheds light on the basic meaning associated with aspectual verbs. Previous findings within the Monadic Non-Derivational Account

(synthesized from Hovav 2014 and Hovav and Levin 2012) can be applied to motivate a theory that considers anticausative verbs as lexically monadic, specifically taking in a singular internal argument. As aspectual verbs are taken to be monadic in nature, and considering that they may only appear with an event denoting complement in the bare intransitive, this set of data serves as further motivation for a type-specific account of aspectual verbs.

Beyond the prior theoretical work reviewed in this dissertation, it is important to note that aspectual verbs have been extensively studied experimentally both within a Type-Shifting framework (McElree et al. 2001; Traxler et al. 2005, 2002, among others) and within the framework of the SIH (Lai, Braze, et al. 2017; Lai, Lacadie, et al. 2017; Lai et al. 2020; Lai and Piñango 2017, 2019). These studies investigate the offline and online computational processing of aspectual verbs, comparing them with neutral verbs and psychological verbs to show the unique processing costs they seem to incur. Previous studies thus focus on the effect of contextual manipulation on these associated costs in order to identify the theoretical crux of their complexity. Indeed, the offline acceptability study presented in 3.4 tests contextual manipulation via a kind of grammatically biasing context in the form of sentential Mental-Attitude adverbs as a way of identifying the availability of multiple dimensional interpretations in transitive aspectual verb sentences. Within processing literature, it is thought that encountering a complex ambiguity between meanings results in excess processing costs for the parser (see Lai, Lacadie, et al. 2017). Therefore, these acceptability results lend further evidence for the dimensional ambiguity exhibited in transitive aspectual verb sentences between constitutive and eventive readings, providing robust offline support for online studies couched within the SIH.

However, this dissertation also indicates significant adjustments necessary for accounts like the SIH, prompting a monadic, underlyingly (anti-)causative, and type-specific semantics for aspectual verbs. As such, the arguments and evidence presented here hold implications for the theoretical perspectives underpinning previous experimental research. Therefore, the results from these studies and those in the future must be reconsidered within the context of the considerations put forth here.

The research presented in this dissertation also adds to the current conversation around the

cross-linguistic behaviors of aspectual verbs. There has not been nearly as much work done on the semantics of aspectual verbs in other languages as compared to English (see Jalbert et al. 2020 and Ma et al. 2022), implying a potential issue in the generality of prior accounts, including the proposal presented in Chapter 6. Further, this small set of research indicates interesting behavioral patterns and differences between languages, especially concerning the availability of certain aspectual verb readings. As such, more extensive research is necessary to distinguish the underlying linguistic mechanisms at play in aspectual verb sentences. However, the extensive cross-lingusitic work within the field of (anti-)causative alternating verbs primarily looking into the complex morphology of Semitic languages (see Doron 1999; Ford 2009; Mashaqba et al. 2020; Al-Qadi 2015; Zibin 2019), may be useful in addressing this.

Relevant to discuss with regard to the cross-linguistic behaviors of aspectual verbs is an additional, thus far unmentioned, critique by Mourounas and Williamson (2019) against the SIH. They claim, due to its type-flexible nature, this theory falsely predicts that if a language contains aspectual verbs, it must also allow their typical transitive constructions. As support for the falsehood of this hypothesized prediction, they cite Lin and Liu (2005) to show that Mandarin Chinese has "long been recognized as a language which lacks complement coercion." However, recent experimental evidence in Ma et al. (2022) proves this to be insufficient evidence. While typical transitive aspectual verb structures (*x began y*) like those provided in Mourounas and Williamson (2019) are indeed considered ungrammatical in Mandarin, Ma et al. (2022) show that in specific focus structures (i.e. *shi x lai begin y*), aspectual verb sentences are significantly more acceptable and behave similarly to the English data. An eye-tracking study shows that this form of aspectual verb sentences in Mandarin indeed incurs higher processing costs than neutral (psych verb) sentences. Furthermore, it isn't entirely clear that the SIH account in fact makes this prediction, as multiple linguistic parameters could be at play in determining the presence or lack thereof of such aspectual verb structures.

Given this evidence and the Icelandic data in Jalbert et al. (2020), it is crucial to consider the implications of previous theories for cross-linguistic behaviors. Indeed, the proposal put forth here

is based on primarily American English data, and the claims discussed may in fact be specific to this language variety. However, it is worthwhile to consider the theoretical evidence and issues raised here from the perspective of different languages in order to provide a comprehensive and holistic account of aspectual verb behaviors.

Investigation into these verbs across languages, and contextualizing them within this discussion, also holds implications for research into their acquisition. The acquisition of aspect, in particular, has been a complex topic of investigation from an infant and second language acquisition perspective (see Bardovi-Harlig and Reynolds 1995; Gabriele and Martohardjono 2005; Shirai and Andersen 1995, among many others). As aspectual verbs specifically modify the lexical aspectual interpretation of the predicate, at least on their eventive readings, they are crucial to consider within this line of study. Further, given the previous literature on these verbs and the claims presented here, investigating their acquisition patterns may also contribute to understanding the acquisition of multiple-dimensional meanings (eventive and constitutive), mereological part-whole relations within language, along with the disambiguation process of complex linguistic ambiguities.

In conclusion, much more research is necessary to investigate how the claims argued for in this dissertation bear on important issues in linguistic typology, aspectual acquisition, and semantic processing. I hope, however, that the research presented here will provide insightful contributions to the broader field of linguistic and semantic research, fostering further exploration and discussion.

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