

IDIOMS AT THE INTERFACE(S):  
TOWARDS A PSYCHOLINGUISTICALLY GROUNDED MODEL  
OF SENTENCE GENERATION

by

DOUGLAS C. MERCHANT  
(Under the Direction of Timothy M. Gupton)

ABSTRACT

The primary goal of this dissertation is to demonstrate that a close analysis of the syntactic and semantic properties of phrasal idioms, both with respect to some well-known constraints on idioms' syntactic mobility and to some lesser-known aspectual co-occurrence restrictions, leads directly to the conclusion that the phonological forms of idioms are not present in narrow syntax. I therefore propose a model of sentence generation in which the conceptual-intentional system is involved in choosing phonologically null but semantically individuated Roots-as-nodes (N-Roots) at the outset of a derivation; these abstract Roots are the units processed by the computational component of the grammar. Cyclically transferred to the interfaces for interpretation and externalization, they are paired at the latter interface with the phonological forms of Roots-as-exponents (E-Roots), based on syntactic and semantic feature mapping.

The secondary goal of this dissertation is to demonstrate that from the psycholinguistic perspective, syntactic structure-building in the context of language production (at least) cannot plausibly be modelled as a bottom-up process powered by iterative Merge. Surveying a range of theory-external as well as theory-internal evidence to this effect, I argue instead for top-down structure-building powered by iterative Branch, wherein N-Roots are inserted in functional, discourse, and scopal positions, and head chains which terminate in their theta positions. Although this aspect of the model is provisional, my intention is to lay the groundwork for in-depth consideration of the interaction between the timing of insertion question (i.e., pre-syntactic or post-syntactic insertion) and the directionality of derivations question (i.e., bottom-up or top-down structure-building) in a unified model. I refer to this combined, provisional model as *Late Insertion, Top-Down (LIT-D)*, to differentiate it from models involving other settings of what one might call meta-parameters: *Late Insertion, Bottom-Up (LIB-U)*, as assumed by most advocates of Distributed Morphology; *Early Insertion, Top-Down (EIT-D)*, as assumed by most who have worked on top-down derivations; and *Early Insertion, Bottom-Up (EIB-U)*, as assumed in most other versions of the Minimalist Program.

INDEX WORDS: Idioms, lexical insertion, lexical interface, lexical aspect, top-down derivations, Merge, Branch, figurative language

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DOUGLAS C. MERCHANT  
BA, University of Arizona, 2013

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DOUGLAS C. MERCHANT

Major Professor:	Timothy Gupton
Committee:	Paula Schwanenflugel Vera Lee-Schoenfeld

Electronic Version Approved:

Suzanne Barbour  
Dean of the Graduate School  
The University of Georgia  
August 2019

## DEDICATION

For David, Shannon, and Josephine Tempio

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## CHAPTER 1: INTRODUCTION

### *1.1 Theoretical overview*

As cognitive science continues to cohere as a discipline, it will become increasingly important for linguistic theory to be interpretable at its interfaces with allied fields such as psychology, neuroscience, and the philosophy of mind. This dissertation addresses what I see as a prerequisite for such external interpretability: we must first have answers to two fundamental questions about the nature of sentence generation. The first question concerns whether phonological insertion is presyntactic or postsyntactic; does the computational component of the grammar operate on “words” with associated phonological information, or on arrays of abstract roots? The second concerns the directionality of derivations; does the brain generate sentences beginning with the most deeply-embedded node (i.e., bottom-up), or beginning with the root node (i.e., top-down)?

I think of these as *meta-parameters*: parameters not of variation between human languages, but rather of variation with respect to how formal systems can be biologically instantiated. These questions are not new, of course; the Insertion meta-parameter has been considered extensively, especially under the program of Distributed Morphology (e.g., Halle & Marantz, 1993; Marantz, 1997; Harley & Noyer, 1999; Embick & Noyer, 2007; Harley, 2014). Research on the Directionality meta-parameter was for a long time scarce, but efforts to translate the machinery of bottom-up approaches into top-down

systems have in recent years increased (Phillips, 1996; 2003; Richards, 1999; Phillips & Lewis, 2013; Chesi, 2007, 2015; Zwart, 2009, 2015; den Dikken, 2018; Merchant, 2019b). To my knowledge, however, these questions have never been addressed in the context of a single model. I intend here to begin to lay the foundations for such an initiative.

In this dissertation, I consider the meta-parameters in the context of examining the syntactic and semantic properties of phrasal idioms. Figurative language occupies a problematic position with respect to the interfaces between the computational, phonological, and interpretive components of the human linguistic system, as it represents a mismatch between phonology and interpretation. In the arts, of course, this is not a bug, but a feature, in which much of the expressive power of language is situated. I illustrate with these lines from *Romeo and Juliet*, where the phonological form standardly mapped to the interpretation ‘diurnal celestial body’ is instead associated with only certain elements of that interpretation:

- (1) But soft, what light through yonder window breaks?/ It is the east, and  
Juliet is **the sun**. (Shakespeare 2.2.2–6)

Perhaps because of its association with modes of expression (and analysis) characteristic of the humanities, there was a paucity of discussion of figurative language in the early generative literature. In the first decade after the publication of *Syntactic Structures* (Chomsky, 1957), only a single short article addressed the topic (Katz &

Postal, 1963),<sup>1</sup> one which may be said to have raised more questions than it answered. Dissenters from Chomskyan orthodoxy seized on this: an article by Chafe (1968) with the title “Idiomatcity as an Anomaly in the Chomskyan Paradigm”<sup>2</sup> argued for the wholesale abandonment of generative syntax in favor of the emerging alternative known as generative semantics. As theorists in the latter movement incorporated phenomena normally associated with pragmatics into their grammatical descriptions,<sup>3</sup> figurative language fell naturally within its purview. Indeed, key figures in generative semantics eventually went so far as to claim that figurative language is central to thought itself. Lakoff and Johnson (1980:3), for example, write that the human conceptual system is “fundamentally metaphorical in character,” with metaphors “the only ways to perceive and experience much of the world” (ibid:239).

Although such claims may seem hyperbolic to most cognitive scientists today, the fact that the standard models did not address figurative language head-on left an opening for such views to proliferate. The dissenters had a point: the centrality of figurative language in actual language behavior is incontrovertible. For example, Pollio, Barlow, Fine, and Pollio (1977) reported that speakers use 1.8 novel metaphors and 4.1 idioms in each minute of discourse, and Jackendoff (1997b) estimates that the number of fixed expressions is at least at the same order of magnitude as simplex lexical items. Clearly, figurative language must require significant memory resources, along with significant processing resources associated with lexical access. It is not a marginal phenomenon.

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<sup>1</sup> Additionally, Uriel Weinreich gave a series of lectures on idioms at the Linguistics Institute in the summer of 1966. This work was posthumously published as Weinreich, 1969.

<sup>2</sup> An allusion to Kuhn (1962).

<sup>3</sup> See Newmeyer, 1986:Chap. 5, for discussion.

Even today, however, most models of the grammar are designed for the insertion of single syntactic heads, and have little to say about idioms except on the periphery. Therefore, any model of sentence generation which takes idioms as its chief dataset starts out with an advantage, yet can easily be generalized to the generation of “literal” sentences. This perspective motivates much of the work in what follows.

## 1.2 Aims of this dissertation

The central goal of this dissertation is to demonstrate that a close analysis of the syntactic and semantic properties of phrasal idioms leads to the conclusion that their phonological forms are not present in narrow syntax. I will argue that idioms like *kick the bucket*, *buy the farm*, and *bite the dust* are unaccusative not only in their semantics, but in the syntactic configuration in which their sole theta roles are assigned: as with the predicate *die*, they assign only an internal theta role, to an argument that subsequently raises to subject position. If this is so, then the pronounced components of an idiom cannot be the representations involved at the level of the derivation at which theta role assignment occurs, as no theta role would be available for *the farm / bucket / dust*.

The impetus for this analysis, then, comes in part from theta-theoretic considerations, but also from the observation that idioms vary in their syntactic mobility, i.e., the extent to which their figurative interpretations are available in varying syntactic configurations. In (2a), we can assign *bought the farm* either a figurative or a literal interpretation, but in (2b-c), only the literal interpretation is available:



- (2) a. [ID/LIT]<sup>4</sup> The old man finally bought the farm.  
 b. [\*ID/LIT] The farm was finally bought by the old man.  
 c. [\*ID/LIT] I was sad to hear about the farm which the old man bought.

With postsyntactic insertion, we can easily account for why *buy the farm*, along with *bite the dust* and *kick the bucket*, cannot passivize, relativize, etc. Neither *the farm*, nor *the dust*, nor *the bucket* is present in the derivation until after such operations apply, and so they're not subject to displacement. Under this account, the derivations for *kick the bucket* and *die* are identical, with precisely isomorphic structure-building up to the point of postsyntactic phonological insertion, when either the literal or the figurative exponent can be chosen. Both derivations are disjunct from derivations involving *kick the [literal] bucket*, a transitive predicate with an external theta role to assign. This is a relatively parsimonious explanation, and moreover, it obviates the need for special interpretive “idiom rules” (as in, e.g., Chomsky, 1980), wherein the semantic features of a lexeme are in some sense “erased” and a new, idiomatic interpretation assigned.

Converging evidence for postsyntactic insertion comes also from a close analysis of the aspectual properties of idioms. In Merchant (2019a),<sup>5</sup> I demonstrate that inner aspect in idioms is compositional with respect to the components of an idiom's figurative interpretation, *not* with respect to the literal meanings of its phonological components (contra McGinnis, 2002, 2005). For example, note that *kick the bucket* and *kick the habit*

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<sup>4</sup> In this dissertation, I use [ID] to indicate the idiomatic reading of a predicate, [LIT] to indicate the literal reading, and [ID/LIT] to indicate that both readings are to be considered in a single example. In (2b), for example, I use [\*ID/LIT] to indicate that the idiomatic reading of the example is not felicitous, but the literal reading is.

<sup>5</sup> Ms. under review.

involve the same verb and a definite, singular DP with a count noun. If they were compositional with respect to the literal meanings of their phonological components, they should evince the same aspectual properties. Instead, they show clear differences with respect to other elements with which they can co-occur: *kick the habit* in (3a) is acceptable with the progressive, but *kick the bucket* in (3b) is not. Conversely, *kick the bucket* can co-occur with a punctual adverbial (4a), but *kick the habit* cannot (4b):

- (3) a. [ID] John was kicking the habit that summer.
- b. [ID] \*John was kicking the bucket when we arrived.
- (4) a. [ID] John kicked the bucket at midnight last night.
- b. [ID] \*John kicked the habit at noon yesterday.

If the phonological components of an idiom are present in narrow syntax only to have their meanings erased by an interpretive rule, nothing prevents durative *kick the habit* from occurring with a punctual adverbial, or punctual *kick the bucket* from occurring with the progressive. If, however, the phonological forms of these idioms are inserted postsyntactically into contexts that are already either durative or punctual, we can account in a straightforward manner for their distribution.

Based on the results of these investigations, I propose a model in which abstract roots with semantic and syntactic features are processed by the computational component of the grammar,<sup>6</sup> and cyclically transferred to the interfaces (as in Chomsky, 2001, 2008).

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<sup>6</sup> This model differs from many models that adopt postsyntactic insertion in that it assumes that roots are semantically individuated. For example, in some versions of Distributed Morphology

I refer to the roots that are manipulated by narrow syntax here as Roots-as-nodes (N-Roots), following Acquaviva's (2008) distinction. At the phonological interface, a speaker may choose to insert any form whose syntactic and semantic features match all or a subset of the features of the N-Root that already exists in the derivation; I refer to these forms as Roots-as-exponents (E-Roots). The form that is inserted may be a phrasal idiom such as *kick the bucket* (which I refer to as a *complex E-Root*), or a simple verb like *die*.

In this model, idiomaticity is a phenomenon associated with externalization only, a property of the interface with the sensory-motor (SM) system. As with phonological form generally, idiomaticity is irrelevant to both the computational component and the conceptual-intentional (CI) system, which require only syntactic and semantic information. This accords with the modern biolinguistic perspective, as in Berwick and Chomsky (2016:40), who write that the SM is “like the printer attached to a computer, rather than the computer’s CPU.”

Although the development of this model will occupy the lion’s share of this dissertation, I turn in the penultimate chapter to the other meta-parameter. Most research in the field tacitly assumes that derivations are constructed bottom-up, by iterative Merge. However, the psychological literature on temporary memory capacity tells us that only a limited number of unrelated “chunks”—perhaps only 3 to 5—can be handled at one time (Cowan, 2001, 2015). When these chunks are composed of words in a sentence, the capacity increases, perhaps to 15-16 words (Baddeley, Vallar, & Wilson, 1987; Baddeley & Wilson, 2002). Many sentences are much longer than this, however, and simply cannot

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(e.g., that of Harley, 2014), roots are individuated neither phonologically nor semantically. I present some arguments against this position in Chapter 4.

be handled by a model which must build entire derivations bottom-up via Merge before a speaker utters the first word of a sentence.

We are left, then, with top-down derivations as a desideratum. My research in this area has been published in preliminary form (Merchant, 2019b), on which I expand in this dissertation. In this model, derivations constructed by iterative Branch proceed top-down, again with a cyclic transfer to the interfaces. This necessitates a recasting of the nature of syntactic movement, with roots inserted in functional/discourse sites (CP, TP), and null copies of the roots being displaced into the propositional layer (i.e., vP), where their theta-features are checked in local configurations. In this model, the equivalent of the Universal Theta-Assignment Hypothesis (UTAH; Baker, 1988) represents the end goal of a derivation, rather than its initial state.

Upon the exhaustion of a phasal subarray (Richards, 2011), the abstract roots are sent to the interpretive and articulatory components, and phonological insertion is triggered. This is the point in the derivation where idioms (and all other phonological forms) are inserted, subject to semantic and syntactic feature mapping. In Chapter 5, I sketch out this model in some detail, contrasting it with those proposed by Phillips (2003), Chesi (2015), and den Dikken (2018), and combining it with the post-syntactic insertion model developed in Chapter 4. The provisional model that arises from this interaction I will refer to as *Late Insertion, Top-Down (LIT-D)*, to differentiate it from models involving other settings of the meta-parameters: *Late Insertion, Bottom-Up (LIB-U)*, *Early Insertion, Top-Down (EIT-D)*, and *Early Insertion, Bottom-Up (EIB-U)*.

### *1.3 Working assumptions and terminology*

For the purposes of this dissertation I assume several theoretical constructs without extensive discussion. As they are mostly well within the mainstream of generative thought, I provide relatively little evidence for these assumptions, referring the reader instead to the foundational works involved and to the ongoing debates and commentaries arising from them. However, I will in this section make some of these assumptions explicit, and provide some theoretical context.

#### *1.3.1 Thematic roles, theta-role theory, and UTAH*

Theta-role theory, which concerns the semantic relationships between predicates and arguments of those predicates, was born in part outside of the standard theory. Fillmore (1968) used the term “Case” to describe what are now considered thematic relations. For example, Fillmore included the following in a list of Cases:

- (5)     *Agentive* (A), the case of the typically animate perceived instigator of the action identified by the verb.
- Dative* (D) [later *Experiencer*], the case of the animate being affected by the state or action identified by the verb.

*Factitive* (F) [later *Object*], the case of the object or being resulting from the action or state identified by the verb, or understood as a part of the meaning of the verb. (Fillmore, *ibid.*:46)

Around the same time, Gruber 1976 [1965] worked out a set of thematic relations for verbs of motion, with labels including Theme, Agent, and Source, formalized in what Jackendoff (1976:93) characterizes as a “quasi-generative semantics ‘prelexical’ level of syntactic derivation.” These notions were incorporated into the interpretive semantics of the standard model by Jackendoff (1972, 1974). Chomsky (1981) subsequently connected thematic roles directly to syntactic theory in his formulation of the Theta Criterion:

- (6) *Theta Criterion*: Each argument bears one and only one  $\theta$ -role, and each  $\theta$ -role is assigned to one and only one argument. (Chomsky, 1981:35)

This refinement of the model allowed for the grammar to distinguish between arguments with semantic content and expletives such as *it* and *there*, and to distinctly index arguments in terms of the semantic role they play with respect to the predicate.

Dowty (1991) surveys the state of the art of theta theory, however, and concludes that thematic role types “are simply not discrete categories at all, but rather are cluster concepts,” or prototypes (*ibid.*:571). He therefore boils theta roles down to two prototype roles: Proto-Agent and Proto-Patient, and defines them in terms of common entailments between predicates and the arguments they select:

- (7) *Contributing properties for the Agent Proto-Role:*
- a. volitional involvement in the event or state
  - b. sentience (and/or perception)
  - c. causing an event or change of state in another participant
  - d. movement (relative to the position of another participant)
  - (e. exists independently of the event named by the verb)<sup>7</sup>
- (8) *Contributing properties for the Patient Proto-Role:*
- a. undergoes change of state
  - b. incremental theme
  - c. causally affected by another participant
  - d. stationary relative to movement of another participant
  - (e. does not exist independently of the event, or not at all)

(Dowty, 1991(27-28))

These entailments are meant to be semantically independent of one another, such that a given predicate may entail one or many of these properties for an argument. For example, in (9a), *fear* entails property (7b) alone for its subject argument *John*, whereas in (9b), *pass* entails only property (7d) for *the rolling tumbleweed*:

- (9) a. John fears Mary.
- b. The rolling tumbleweed passed the rock. (Dowty, *ibid*:(29b,d))

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<sup>7</sup> Dowty expresses doubt as to whether this should really be considered a contributing property, noting that it might be better attributed to “the discourse associations of subjecthood” (and the lack thereof) than to the definition of proto-roles (*ibid.*: 572); the property in (8e) would have a similar status. I will therefore rarely reference these properties here.

In an extension of Chomsky's (1981) Theta Criterion, Baker (1988) argued that not only is there a one-to-one relationship between the arguments of a predicate and the theta roles it assigns, but that theta roles are assigned in uniform positions in the syntax. This hypothesis was formulated as follows:

- (10) *Uniformity of Theta Assignment Hypothesis (UTAH)*: Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure.

(Baker, 1988:46)

The adoption of (10) into the theory led to a picture in which arguments are inserted into standard structural positions within the tree; these became known as *theta positions*. Baker left the specifics of which theta roles are assigned (and where) somewhat open, but in Baker (1997) comes around to Dowty's (1991) position that the variety of roles in the literature cluster into two prototype categories.

I assume in this dissertation that these conclusions are substantially correct, and adopt Dowty's distinction as well. However, I retain also the older terminology of *Agent* and *Theme*, and will occasionally use the term *Experiencer* to distinguish, on the one hand, arguments that surface in the subject position bearing the Proto-Patient role (i.e., derived subjects), and on the other, arguments that surface in the subject position bearing the Proto-Agent role. I assume also that the basic insight of UTAH is correct, as well, with Proto-Patients (Themes and Experiencers) being assigned their theta roles internal to



VP, and Proto-Agents (here, just Agents) being assigned their theta roles in the specifier of vP. However, I return to the role that UTAH plays in a derivation in Chapter 5, where I reformulate it as the *Universal Theta-Checking Hypothesis (UTCH)*, arguing that arguments are inserted not in theta positions, but rather in functional/discourse positions, heading chains wherein the lowest member of the chain must end up in a theta position in order for a proposition to be interpretable.

### 1.3.2 Syntactic unaccusativity and Burzio's generalization

Intransitive verbs superficially form a syntactic class in that they surface only with a subject argument, not a direct object argument. However, intransitives do not form a homogeneous class with respect to the semantic roles assigned to this sole argument, an observation going back at least to Fillmore (1968).<sup>8</sup> Intransitives are therefore frequently subcategorized as either *unergative* or *unaccusative*. For unergatives, the activity engaged in by the verb is generally volitional or semi-volitional on the part of the subject; common unergatives include *sing*, *swim*, and *smile*. For unaccusatives, the action is generally not volitional, but rather involves a change of state or location that happens “to” the subject;<sup>9</sup> unaccusatives include verbs such as *awake*, *redde*, and *die*.

The question of whether this semantic distinction is reflected in the syntax was addressed by Perlmutter (1978). Working in the model known as Relational Grammar (where “stratal” diagrams represent the levels of a derivation and numbers are assigned to

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<sup>8</sup> Published as part of Fillmore (2003), as reviewed by Wasow (2006).

<sup>9</sup> This of course is an oversimplification; I will comment on complications as they arise.

elements in a hierarchy of relations), Perlmutter phrases the Unaccusative Hypothesis as in (11):

- (11) *Unaccusative Hypothesis*: Certain intransitive clauses have an initial 2 but no initial 1. (Perlmutter, *ibid.*:(10))

In the standard theory, the equivalent would be something like (12) (my formulation):

- (12) *Unaccusative Hypothesis (restated)*: The subjects of some intransitive verbs [viz. unaccusatives] are initially and at some underlying level located in the direct object position.

The subjects of unaccusative verbs, then, are underlying direct objects which raise to subject position in what Perlmutter refers to as *unaccusative advancement*. He illustrates with the example in (13) (accompanied by a stratal diagram), arguing that *gorillas* is initially the object of *exist* but subsequently advances to subject position:

- (13) a. Initial:                exist gorillas.  
       b. Final: Gorillas exist \_\_\_\_\_ (Perlmutter, *ibid.*:(11-12))

The subcategories of verbs Perlmutter considers to be unergative include 1) predicates describing volitional acts (*speak, dance, sing, meditate*) and 2) predicates of

non- or semi-volitional bodily processes (*belch, sneeze, urinate, weep*). Subcategories of verbs Perlmutter considers to be unaccusative include 1) predicates whose argument is semantically a patient (*burn, hang, freeze, die*), 2) predicates of existing and happening (*transpire, occur, arise, vanish*), and 3) aspectual predicates (*begin, start, stop, cease*) (ibid.:161-63).

Rosen (1984) argues, however, that the semantics of a verb is insufficient to predict whether it is syntactically unergative or unaccusative, noting that in Italian, *russare* ‘snore’ patterns syntactically as an unergative, as it takes the auxiliary *avere* ‘have’ in the perfect. However, *arrossire* ‘blush’, which likewise refers to a bodily process, patterns syntactically as an unaccusative, as it takes instead the auxiliary *essere* ‘be’ in the perfect. But Levin and Rappaport Hovav (1992:248-9; see also Levin, 1993:12-14) point out that *arrossire*, which literally means ‘become red’, describes a change of state, whereas *russare* ‘snore’ does not. Thus the semantic concept “bodily process” is not sufficient to guarantee that a verb is unergative; other factors, for example the atelicity of *russare* and the telicity of *arrossire*, may be at play in determining verb class.<sup>10</sup>

The adaptation of the Unaccusative Hypothesis (Perlmutter, 1978) from the Relational Grammar framework into the Chomskyan model came in part from Burzio (1986), along with an important addendum which has become known as Burzio’s generalization:

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<sup>10</sup> For more on aspectual properties such as telicity, see Chapter 3 of this dissertation.

- (14) *Burzio's generalization*: All and only the verbs that can assign a  $\theta$ -role to the subject can assign accusative Case to an object. (Burzio, 1986:178)

Burzio's generalization unites passives and unaccusatives in that in neither do we find a theta role assigned to an external argument, and neither assign accusative Case. This explains the ungrammaticality of (15a-b), wherein the derived subject cannot have received accusative Case in either the passive (15a) or the unaccusative (15b) predicate:

- (15) a. \*Him was bitten by the rattlesnake.  
b. \*Him died.

Although there have been many attempts to provide an explanatory basis for Burzio's generalization, it remains a descriptive stipulation, one that may be epiphenomenal. For example, Woolford (2003) argues that it is derivable from a more general principle that sentences must have nominative Case, proposing (16) to replace it:

- (16) *New Descriptive Generalization (replacing Burzio's generalization)*:  
The object gets nominative Case when there is no (nominative) subject.  
(Woolford, 2003(4))

I will not attempt in this work to fully characterize unergativity and unaccusativity from a semantic perspective; indeed, I remain agnostic on whether or not this is fully

possible. I do assume, however, that certain predicates such as *die* are syntactically accusative, in that their surface subject arguments raise from the direct object position. Likewise, I refrain from investigating the principles underlying Burzio's generalization, but assume that some version of it is essentially operative in the grammar.

#### *1.4 Idioms: Definitions and subtypes*

Although this work is concerned with idioms, it is not my intention to rigorously define the notion of an idiom at the outset, as I think such a definition is neither fully possible nor especially desirable.<sup>11</sup> This is because I see idiomaticity as essentially continuous with “literal” language in the way in which phonological forms are inserted into syntactic structures, a position that I defend in some detail in Chapter 4, where I argue for an account of lexical insertion that applies equally to figurative and literal language.

Furthermore, even if one felt justified in treating idioms categorically, it may not be possible to do so. As Nunberg, Sag, and Wasow (1994:494) put it, “[i]dioms are not after all a linguistically natural kind, in the sense of being candidates for a category of universal grammar, and for theoretical purposes, the category can be defined in different ways for diverse purposes.” Idioms vary greatly in the degree of structure they subsume, from lexical idioms such as *hot dog* up to clausal idioms such as *two wrongs don't make a right*. They also vary at least with respect to the properties of *noncompositionality* (the extent to which their meanings are unpredictable given the meanings of their parts), *syntactic immobility* (the extent to which they retain their figurative interpretations in

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<sup>11</sup> But for an excellent discussion of the issues involved, see Stone (2016:§1.2). As noted below, in Chapter 4, I define an idiom as a *complex Root-as-exponent (E-Root)*, which is an entirely functional definition.

different syntactic configurations), and *opacity* (the extent to which a plausible original motivation for the idiom is accessible).<sup>12</sup> Nunberg et al. point out that none of these properties applies to all idioms (except perhaps noncompositionality), although they suggest that collocations which lack these properties, such as *tax and spend* and *resist temptation*, should perhaps not be considered idioms.

Jackendoff (1997b:Chap. 7), however, argues on the basis of his *Wheel of Fortune* corpus, which consists of about 600 puzzle answers collected from that game show, that “fixed expression” is perhaps a more coherent notion, and that idioms should be understood on that basis. In addition to prototypical idioms such as *kick the bucket*, the corpus includes compositional compounds (*frequent flyer program*), names of people, places, brand names, and organizations (*Count Dracula*, *Beverly Hills*, *Jack Daniel’s whiskey*, *New York Yankees*), clichés (*we’re doing everything humanly possible*), titles of songs, books, movies, etc. (*All You Need Is Love*), quotations (*Beam me up, Scotty*), and foreign phrases (*c’est la vie*). Jackendoff argues that all of these collocations have stipulated phonological, syntactic, and semantic structure, as is the case with any other lexical item, and that the lexicon therefore must admit phrasal material.

If this is so, we can provisionally treat idioms as special cases of clichés, for which “combinations of independently listed items are listed redundantly,” differing only in that “their meaning is not entirely a function of the meanings of their constituents” (ibid.:165). With the caveats mentioned above, I therefore adopt the following as a working definition:

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<sup>12</sup> Nunberg et al. (ibid.:492-94) refer to noncompositionality and syntactic mobility as *conventionality* and *inflexibility*, respectively, and add also *figuration*, *proverbiality*, *informality*, and *affect*. These last three properties are relevant to the use of idioms in discourse, but I think irrelevant to the grammatical properties which concern us here.

- (17) *Idiom*: A combination of independently listed lexical items listed redundantly in the lexicon, whose meaning is not entirely a function of the independently listed meanings of these items.

When I take up the insertion of idioms in Chapter 4, I will make the claim that idioms differ from literal language primarily in that they are multipart expressions that need to be inserted *en bloc* at the interface with the sensorimotor system; I refer to them there as *complex E-Roots*. I will revise (17) at that time.

Finally, in the present work, I will be mostly concerned with *phrasal idioms*. Such idioms contain a verb plus an internal argument, verbal adjunct (as in *beat around the bush*), or both, but lack a fixed external argument, and are not specified with respect to tense, modality, or discourse-related features. Phrasal idioms are headed by verbs, and (in English) are perhaps exclusively verb-initial. They thus appear to subsume the level of the VP. Phrasal idioms include the following:

- (18) Phrasal idioms: *kick the bucket; beat around the bush; paint the town red*

We can distinguish these from nominal idioms, which consist of a head noun and (optionally) an adjective, determiner, and/or prepositional phrase modifier:

- (19) Nominal idioms: *hot dog; the slammer; a force of nature*

In contrast to phrasal idioms, *phasal idioms* appear to subsume not only the level of VP, but also the level of vP, as they include either an external argument or a passive Voice<sup>13</sup> head:

- (20) Phasal idioms: **the cat** is out of the bag, the die **is** cast<sup>14</sup>

Note that while I refer to these idioms as phasal, a sentence in which they're embedded will of course include functional structure above the level of the vP, including (e.g.) a Tense head (*The cat **was** out of the bag.*) However, this material is not fixed as part of the idiom. For *clausal idioms*, on the other hand, at least some of this functional structure is fixed. Note the unacceptability of the idioms in (22a-c); in (22a), the modal is changed, and in (22b-c), the negation is removed:

- (21) Clausal idioms: *You can't unring a bell; Don't count your chickens*

*before they've hatched; Two wrongs don't make a right*

- (22) a. [ID] \*You shouldn't unring a bell  
 b. [ID] \*You can unring a bell  
 c. [ID] \*Count your chickens before they've hatched.

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<sup>13</sup> For present purposes, although I refer to passive *be* as a Voice head, I assume that the projection it heads is equivalent to vP, but defective in that it assigns no Agent theta role.

<sup>14</sup> *The die is cast* is obligatorily passive: compare [*\*ID*] *Caesar cast the die*. Note that as it includes a passive Voice head, the material in *the die is cast* subsumes only a weak phase (in the sense of Chomsky, 2001).



Clausal idioms are often referred to as *proverbs*, although for some this category may include phasal idioms as well,<sup>15</sup> and definitions of the term are often at least partially usage-based, as opposed to the strictly syntactic definition of clausal idioms here. For example, Doyle, Mieder, and Shapiro (2012:xi) define proverbs as follows:

[F]ull sentences (or, in a few cases, elliptical sentences), formulaic though variable in their wording, that express general observations, assertions, or propositions, usually (but not always) with the presence of some figurative aspect or application.

The fixed material in clausal idioms interact with syntactic phenomena to a far more limited degree than is the case for phrasal and phasal idioms; for the most part, they appear to be fully-formed clauses which can be embedded into sentences quotatively, as in (23a), but whose material cannot be extracted, as we can see from (23b):

- (23) a. My mother always said [don't count your chickens before they've hatched].
- b. [ID] \*Which chickens did you say I shouldn't count before they've hatched?

As such, the issues involved with clausal idioms (e.g., their functioning with respect to discourse) are not directly relevant to the topics under consideration here, and I

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<sup>15</sup> One might also consider them to be clichés, in the sense of Jackendoff (1997b:155,165).

will rarely have cause to comment on them. Similarly, nominal idioms involve an quite different set of questions (e.g., the nature of determiners, the phasehood of DPs) than do phrasal and phasal idioms, and I will largely refrain from their analysis in what follows.

### *1.5 Conclusion and outline of the dissertation*

In this chapter, I have provided an overview of the central concerns of this dissertation (the Insertion and Directionality meta-parameters) and the context in which they'll be addressed (the syntactic and semantic behavior of phrasal idioms) (§1.1-2). Additionally, I have briefly discussed some theoretical constructs fairly mainstream in terms of my assumptions concerning them, including theta theory, UTAH, syntactic unaccusativity, and Burzio's generalization (§1.3). Finally, in §1.4, I have pointed to some of the problems with defining the notion *idiom*, and with treating idioms categorically, before introducing a working definition, one which will be revised in the context of lexical insertion models in Chapter 4. I have also characterized the differences between phrasal, phasal, nominal, and clausal idioms, noting that I will be concerned mostly with phrasal idioms in the present work.

Chapter 2 will consist of an extended look at the syntactic behavior of phrasal idioms, particularly with respect to constraints on their passivization, beginning with the earliest work on this question in the generative tradition and continuing through the present day. In the end I will argue that the data is best explained in terms of the semantics associated with the figurative interpretation of an idiom constraining the syntactic configurations in which it can appear. In doing so, I conclude that these

constraints are sufficient to explain the data, and that no evidence exists that the semantics associated with the literal interpretation of an idiom is in any way active during the production of an idiom. I therefore posit the *Principle of Semantic Inertness*, a generalization that states in part that “only the intended conceptual structure of a predicate is relevant to the computational and interpretive component.” Finally, I look at figurative extensions of idioms, arguing that they generally represent instances of meta-language, and need not be explained in terms of the normal processes of the grammar.

In Chapter 3, based on Merchant (2019a), I turn my attention to the aspectual properties of phrasal idioms. After reviewing previous models of aspect and some tests for aspectual class, I adopt the privative features model of Olsen (1997). I show that previous claims that aspect in idioms is compositional with respect to the literal reading of an idiom don’t stand up to scrutiny. Indeed, I show that idioms like *kick the bucket* and *kick the habit* diverge in terms of their aspectual properties, both from each other and from their literal readings. Instead, I argue that these properties are largely predictable on the basis of their idiomatic meanings, explaining this in terms of the Principle of Semantic Inertness introduced in Chapter 2. I demonstrate also that some phrasal idioms are more highly specified with respect to aspect than their commonly paraphrased meanings, and discuss the implications for Olsen’s system and for the syntax of inner aspect, suggesting that phrasal idioms may lexicalize a larger structure than verbs, including an inner aspect head.

Given the converging evidence from Chapters 2 and 3 that the semantics of an idiom’s figurative meaning are the chief determinant of its syntactic mobility as well as its aspectual properties, I argue in Chapter 4 that this is best explained in terms of a

model that adopts postsyntactic insertion. I review various models of lexical insertion, as well as the basics of Distributed Morphology, the most prominent model that includes postsyntactic insertion in most formulations, taking a critical look at the revisions to this model proposed by Embick (2000), who argues for early insertion, and Harley (2014), who argues that roots are not semantically individuated in narrow syntax. In the model I propose instead, idioms are exceptional in terms of insertion only that they must be inserted *en bloc* into semantically individuated Roots-as-nodes. Finally, I present several sample derivations, illustrating how this model accounts for the constraints on syntactic mobility of some of the idioms considered here, as well as the constraints on the aspectual environments into which these idioms can be inserted.

Chapter 5, based on Merchant (2019b), will be somewhat more speculative in its approach. The main goal of this chapter will be to convince the reader of two things: one, a theory of linguistic competence must include a theory of real-time sentence generation, modelling (albeit abstractly for now) the procedure by which the human brain generates a sentence, not other formally possible methods of generating that same sentence. Two, the extensive psychological literature on the nature of temporary memory capacity suggests that bottom-up derivations are just not workable as models of real-time sentence generation, as they require entire derivations to be complete before the first word is spoken. After presenting these theory-external arguments, I briefly review some theory-internal evidence in favor of top-down derivations. I then proceed to lay out the general outlines of the model I refer to as *Late Insertion, Top-Down (LIT-D)*: a top-down, phase-theoretic, postsyntactic model of sentence generation, informed by the syntactic and semantic behavior of phrasal idioms, based in part on the models of Phillips (1996,

2003), Chesi (2007, 2015), and den Dikken (2018). Although the model I propose will be quite provisional, I briefly discuss how it can account for some long-established phenomena, e.g. island effects (Ross, 1985 [1967]).

Finally, I discuss in Chapter 6 some of the limitations of this account, as well as proposed experimental investigations of some of the theoretical claims I've advanced here, describing in detail a planned cross-modal priming study on unaccusativity in idioms. I then summarize the key conclusions of this dissertation, and conclude.

## CHAPTER 2: THE SYNTACTIC (IM)MOBILITY OF PHRASAL IDIOMS

### 2.1 Overview

This chapter consists of an examination of the syntactic behavior of phrasal idioms, particularly with respect to constraints on their passivization, beginning in §2.2 with the earliest work on this question in the generative tradition. Most of these approaches depend on assigning idiosyncratic features to idioms in order to constrain their mobility; I argue that these approaches are problematic from an acquisition perspective, as a child would have to posit such features simply on the basis of the lack of forms in the input. However, I conclude that a synthesis of the models of Newmeyer (1974), Nunberg et al. (1994), and Horn (2003) obviates this problem, and accounts for the syntactic mobility of idioms quite parsimoniously. Under this synthesis, the constraints on mobility fall out directly from the semantics of an idiom, something which must be available in the input in any case. In §2.3, I argue that the semantic representations associated with the figurative interpretation of an idiom constrain the syntactic configurations in which it can appear by delimiting the thematic structure of the idiom, and thus the theta roles that are assigned. In doing so, I conclude that these constraints are sufficient to explain the data, and that the semantic representations associated with the literal interpretation of an idiom are not in any way active during the production of an idiom. I therefore posit the *Principle of Semantic Inertness*, a generalization that states in part that “only the intended conceptual structure of a predicate is relevant to the computational and interpretive

component.” Finally, in §2.4, I look at figurative extensions of idioms, arguing that they represent instances of meta-language, and need not be explained in terms of the normal processes of the grammar. Section 2.5 concludes.

## 2.2 *The problem of the syntactic (im)mobility of idioms*

The phenomenon I will be concerned with in this chapter is apparent in Chomsky’s (1980:152) distinction between “idioms that appear at both the D- and S-structure levels, and idioms that appear only at the D-structure level”; only the latter are “immune to movement rules.” The same phenomenon has variously been referred to as idioms’ *ambiguity* (Katz & Postal, 1963), *transformational[] deficien[cy]* (Chafe, 1968), *transformational recalcitrance* (Fraser, 1970), *syntactic frozenness* (also Fraser, 1970), *syntactic productivity* (Gibbs & Nayak, 1989), *syntactic freedom* (Jackendoff, 2002), *syntactic versatility* (Tabossi, Wolf, & Koterle, 2009), and *syntactic flexibility* (Nunberg, Sag, & Wasow, 1994; Egan, 2008; Arseneault, 2014; Chae, 2015). In this dissertation, I adopt the term *syntactic mobility*, as used by Jackendoff (1997b, 2002) and Horn (2003), defining it as follows:

- (24) *Syntactic mobility*: The extent to which the figurative interpretation of the phonological components of an idiom remains felicitous when these components occur in noncanonical syntactic configurations.

What counts as a canonical configuration will vary from idiom to idiom, especially for *phasal* (as opposed to *phrasal*) and *clausal* idioms;<sup>16</sup> contrary to Chomsky's generalization, some idioms are restricted to S-structure configurations, as noted by Nunberg, Sag, and Wasow (1994:515-16). For example, for *the die is cast*, the canonical configuration is the passive, with the Theme argument in subject position; indeed, this idiom is infelicitous in the active voice (*[\*ID] Caesar cast the die*). However, for most *phrasal* idioms, the canonical configuration will be a standard active, indicative configuration, with the Theme argument of the verb in direct object position, internal to the VP.

For some phrasal idioms, however, the figurative interpretation is also felicitous in a variety of noncanonical configurations. An example of such an idiom is *spill the beans*, which is felicitous not only in its canonical configuration (25a), but also passivized, nominalized, or relativized, as in (25b-d):

- (25) a. [ID/LIT] Mary spilled the beans.  
       b. [ID/LIT] The beans were spilled by Mary.  
       c. [ID/LIT] Mary's spilling of the beans was unfortunate.  
       d. [ID/LIT] The beans that Mary spilled will doom us all.

Other idioms allow only very limited modifications. For example, *kick the bucket* allows only metalinguistic modifications, such as *kick the ol' bucket* or *kick the*

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<sup>16</sup> See §1.4 of this dissertation for definitions and discussion.



*proverbial bucket*.<sup>17</sup> Compare (26a), in which either an idiomatic or a literal reading is possible, with (26b-d), which can only be interpreted literally:

- (26) a. [ID/LIT] John kicked the bucket last night.  
 b. [\*ID/LIT] The bucket was kicked by John this morning.  
 c. [\*ID/LIT] John's kicking of the bucket was unfortunate.  
 d. [\*ID/LIT] The bucket that John kicked involved much suffering.

I refer to idioms such as *spill the beans* as *syntactically mobile*, and idioms such as *kick the bucket* as *syntactically immobile*. Accounting for this variation will occupy the remainder of this chapter.

### 2.2.1 Global immobility: A case study of a single case

Katz and Postal (1963) provide the first generative account of why an idiom like *kick the bucket* cannot passivize. Formalizing it in terms of the semantic theory then under development,<sup>18</sup> they argued that for an idiomatic reading to be assigned to an idiom, it must be dominated by a single constituent that dominates no other constituent not part of the lexical entry of the idiom:

Given a string of morphemes  $\underline{t}$  that is dominated by the constituent  $\underline{C}$  in the underlying phrase marker  $M$ , assign to the set of readings associated with  $\underline{C}$  in  $M$

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<sup>17</sup> These modifications may be metalinguistic in character; see §2.4 for more on metalanguage.

<sup>18</sup> Published the following year as Katz & Postal (1964).

those readings from the dictionary entry for  $\underline{t}$  that have the form  $\underline{t} \rightarrow C \rightarrow X$ , where  $X$  is the representation of the meaning of  $\underline{t}$  provided by the dictionary of the semantic theory. This method thus assigns readings to higher level constituents in underlying phrase markers, not to terminal symbols. (Katz & Postal, 1963:278).

In the earliest versions of the theory, passive sentences were assigned the same underlying phrase markers as equivalent active sentences, with the passive transformation optionally applying. However, Edward Klima<sup>19</sup> had recently suggested that passive sentences differ in that their underlying phrase markers include a Manner Adverbial constituent with a passive morpheme as its terminal; the presence of this constituent then automatically triggers the passive transformation. Working under this new conception of the passive, Katz and Postal argued that for a phrasal idiom to be assigned its idiomatic interpretation, a node must exist that exhaustively dominates the idiom's components. If a passive morpheme is additionally dominated by such a node, no overarching idiomatic interpretation can be assigned to these components. Katz and Postal represent the underlying phrase marker sentence of (27a) as in (27b):

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<sup>19</sup> Klima's work on this subject was unpublished, and is cited by Katz & Postal only as "E.S. Klima, Unpublished work, 1960-1961."

(27) a. [\*ID/LIT] The bucket was kicked by John.

b.

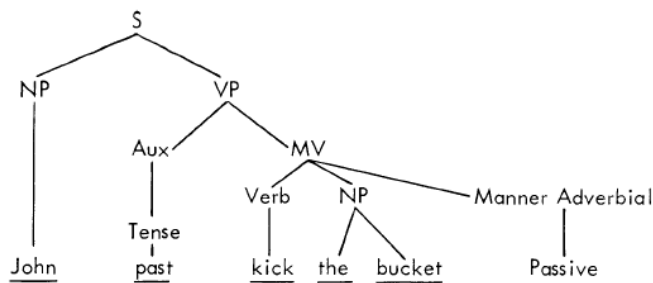


Diagram 2

(Katz & Postal, *ibid.*:280)

However, individual literal interpretations may still be assigned to each component, which accounts for why sentences like (27a) are interpretable literally, but not idiomatically.

Two main deficits are apparent with this explanation. The first is that no independent argument is given for why the passive morpheme is internal to the constituent dominating the idiom (labelled as MV), and not separately dominated by VP (as is Aux); if the latter, Katz and Postal's explanation falls apart. However, even if such an argument were adduced, this account fails to generalize to idioms such as *spill the beans*, which as we have seen retains its ambiguity in the passive, where both literal and figurative interpretations are felicitous (see (25b) above). As the passive of *spill the beans* would presumably have the same sort of underlying phrase marker as the passive of *kick the bucket*, we have no explanation for how the former idiom could passivize, and so Katz and Postal's model significantly undergenerates.

### 2.2.2 Idiosyncratic accounts

Given the empirical inadequacy of a one-size-fits-all approach to syntactic immobility, it seemed for some time that idioms simply must be idiosyncratically marked for which transformations they could *not* undergo. For example, Weinreich (1969) concluded that an idiom like *shoot the breeze*, in addition to specifying the presence of a subject noun with the features [+animate, +plural\_\_\_], specifies also the absence of the passive and negative morphemes via the features [-\_\_\_passive] and [-Neg-\_\_\_], and prohibits nominalization via the feature [-<sup>T</sup>Nom-of]. A fully mobile idiom like *spill the beans*, on the other hand, would be marked as amenable to all three.

Katz (1973) criticized Weinreich's approach as adding "a great number of new symbols to syntactic theory, which constitutes a proliferation intolerable by common standards of simplicity" (ibid:367). "Simplicity" is in the eye of the beholder, of course, but the related question of learnability is salient here, and the abstractness of Weinreich's features would certainly pose an acquisition problem: in order to assign a given idiom one of Weinreich's features, a child would have to infer on the basis of indirect negative evidence—the lack of transformed tokens in the input—which specific transformations were prohibited for every idiom in the language. Although indirect negative evidence may in some cases aid parameter setting (Chomsky, 1981),<sup>20</sup> I know of no argument that

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<sup>20</sup> Chomsky (1981) distinguishes between three types of evidence a child might have access to in acquisition. *Positive evidence* is the existence of forms in the input, and is most important. *Direct negative evidence*, or explicit corrections from the speech community, is largely absent (and when present, inconsistent; see e.g. Marcus (1993)). *Indirect negative evidence*, or the absence of forms in the input, may however in some cases be useful: "[I]f certain structures or rules fail to be exemplified. . . where they would be expected to be found, then a (possibly marked) option is selected excluding them in the grammar, so that a kind of 'negative evidence' can be available even without corrections, adverse reactions, etc." (Chomsky, 1981:9). See also Rizzi (1980).

it might plausibly play a role in a child positing an idiosyncratic lexical exception along these lines, i.e., prohibiting a transformation otherwise applicable under a literal reading.

Instead, Katz argued that idioms are not holistically marked as resistant to specific transformations; rather, their subcomponents are individually labelled as to whether they can be targeted by transformations at all. In this model, components that can be targeted in transformations bear a [-Idiom] feature, whereas immobile parts of an idiom bear a [+Idiom] feature. For *kick the bucket*, then the components *kick*, *the*, and *bucket* are all marked [+Idiom], as is the NP *the bucket*. As no transformation can target a [+Idiom] component, *the bucket* cannot be extracted for the purposes of nominalization or passivization, thus deriving the unacceptability of the idiomatic readings of (26b-d) above.

In contrast, mobile idioms like *lay down the law* have extractable components, and these are marked [-Idiom]. In Katz's model, *lay* is [+Idiom], as are the individual components *the* and *law*, whereas *down* is marked [-Idiom],<sup>21</sup> as is the NP constituent *the law*:

(28) *lay down the law*

**Idiomatic constituents:** *lay*; *the*; *law*

**Nonidiomatic constituents:** *down*; *the law*

(Adapted from Katz (1974(33))

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This is of course true for L1 acquisition generally. For example, a child must deduce from the language environment that English is *not* pro-drop, simply from the lack of subjectless sentences.

<sup>21</sup> This is necessary because Katz deems particle movement to be felicitous with this idiom, as in *His parents laid the law down*.

Although Katz's account is at first glance conceptually simpler than Weinreich's, making use of only a single feature, the acquisition question is no less problematic here, as Nunberg (1978:211-12) points out. Indeed, in both cases the child is faced with the same problem, and in neither case would it seem that sufficient data would be available to construct a representation. In both models, the child must infer merely from the lack of forms in the input (!) that certain transformations are idiosyncratically prohibited, idiom-by-idiom. For Weinreich, the child concludes that (e.g.) *kick the bucket* is specified as prohibiting passivization and nominalization, but *lay down the law* is not. For Katz, the child concludes that *the bucket* is idiomatic and nonextractable but that *the law* is nonidiomatic and therefore extractable, despite the node dominating it (*lay down the law*) and the nodes it dominates (*the, law*) all being idiomatic/nonextractable. In both cases, this amounts to the child being forced to posit idiosyncratic features of idioms on the basis of insufficient data. Although the implementation of these idiosyncrasies varies between the two models, it seems clear that neither goes beyond descriptive adequacy.

### 2.2.3 A hierarchy of transformations: Taxonomic idiosyncrasy

In an attempt to move beyond these idiosyncratic approaches, Fraser (1970) advocated a model which he referred to as a "Frozenness Hierarchy," which stipulated that if a given idiom is amenable to a certain transformation, this entails its amenability to less disruptive transformations lower in the hierarchy, but not necessarily to more disruptive transformations higher up. In this model, an idiom is marked according to the most

disruptive transformation it accepts, ranging from L6 (unrestricted) to L0 (completely frozen). The hierarchy is as follows:

(29) *Fraser's Frozenness Hierarchy*

L6 – **Unrestricted**. Allows topicalization, clefting, etc. Fraser claims that no idiom belongs to this class, as all show some transformational deficiency.<sup>22</sup>

*\*It was the law that she laid down.*

L5 – **Reconstitution**. Allows action nominalization.

*Her laying down of the law to her daughter was unfair.*

L4 – **Extraction**. Allows passivization, prepositional preposing, etc.

*The law was laid down by her mother.*

L3 – **Permutation**. Allows particle movement, etc.

*She laid the law down.*

L2 – **Insertion**. Allows non-idiomatic material to be inserted.

*?She laid down (a strict interpretation) of the law.*

*John read (the class) the riot act.* [Fraser's actual example]

L1 – **Adjunction**. Allows gerundive nominalization.

*Her laying down the law to her daughter was insensitive.*

L0 – **Completely Frozen**. "Literally uninterpretable" idioms such as *trip the light fantastic*.

(Adapted from Fraser, 1970:36-39)

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<sup>22</sup> However, James McCawley (writing under the pseudonym Quang Phuc Dong (Dong, 1971 [1968])) offers *It was a shit I took, not a piss* as an example of a clefted idiom.

A given idiom, then, is lexically marked as, say, [+L4], in which case it can appear in the passive; this entails that it will accept operations further down the hierarchy, such as those in L2, *Insertion*. The acceptability of *The beans were spilled*, then, would entail the acceptability of *His spilling the beans*.

Although the terminology and assumptions are outdated,<sup>23</sup> for example in assuming that nominalizations are created by transformations applied to verbal phrase markers,<sup>24</sup> Fraser's Frozenness Hierarchy represented the first attempt to coherently classify a wide range of idioms. Furthermore, it is an empirically falsifiable model. Yet this is also its weakness, as a single clear counterexample can bring down the whole model: any idiom which violates the hierarchy by allowing a more disruptive transformation but not a less disruptive one means either that the hierarchy itself is invalid, or that it needs to be restructured entirely to account for the new data. Note that this holds even if we allow for idiolectal variation; Fraser himself (ibid.:fn. 4) emphasizes that although different idioms will be marked at different levels for different speakers, the hierarchy itself will hold true for all speakers.

Are there counterexamples to Fraser's hierarchy, then? Newmeyer (1974:fn. 3) writes that in his judgement, *lay down the law*, which Fraser marks as +L5, resists L3 particle movement (*\*She laid the law down*), despite accepting L4 passivization (*The law*

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<sup>23</sup> Nüger (2016:218) reformulates this hierarchy in Distributed Morphology terms, replacing (e.g.) L5's "Permutation" with "Category Changes," although as noted below, he expresses doubt as to its crosslinguistic applicability.

<sup>24</sup> Fraser's work on this topic was originally delivered at the summer meeting of the LSA in 1968, and so predates Chomsky's (1970 [1967]) "Remarks on Nominalization" and its associated Lexicalist Hypothesis.



*was laid down*).<sup>25</sup> Likewise, Machonis (1985) writes that for him, *stir up a hornet's nest* (something like 'cause consternation') accepts passivization, but resists particle movement:

- (30) a. Max stirred up a hornet's nest (by cancelling the meeting).  
 b. \*Max stirred a hornet's nest up (by cancelling the meeting).  
 c. A hornet's nest was stirred up by Max's cancelling of the meeting.

(Machonis, 1985(21))

If these judgements are valid, Fraser's hierarchy (as it stands) is doomed. But there are additional conceptual problems with the hierarchy. No explanatory basis for it is evident, and it is not entirely clear whether Fraser intends it to be peculiar to English or universal. If the former, what parameter(s) set it apart from equivalent hierarchies in other languages? If the latter, what universal principle(s) underlie the hierarchy of disruptivity? There seems to be no independent basis for why, e.g., action nominalization should be so much more disruptive than gerundive nominalization. And although the matter is probably worthy of further investigation, at least some evidence suggests that the hierarchy is not crosslinguistically applicable: Strässler (1982), citing Burger (1973:70f), claims that the hierarchy is not valid for German, and Nuger (2016) argues the same on the basis of Palauan idioms.

Finally, although Fraser's taxonomy is more coherent than the purely idiosyncratic approaches of Weinberg (1969) and Katz (1973),<sup>26</sup> it does not actually

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<sup>25</sup> Newmeyer's judgements; for Fraser, as well as for Katz (1973), particle movement is acceptable here.

move beyond these models in terms of the learnability problem. Indeed, in Fraser's model as it stands, the child is faced with the same quandary as described in §1.2.3 above, with only the lack of transformed tokens in the stimulus to indicate what level in the hierarchy an idiom belongs to. This is clearly insufficient; what is needed is a model in which the mobility of an idiom falls out directly from other properties of the idiom which *are* available in the input. I turn to such a model in the next section.

#### 2.2.4 A semantic-syntactic account

Newmeyer's (1974) approach broke radically with the previous idiosyncratic attempts in that he sought to connect idioms' syntactic immobility directly to their semantic representations, and how these representations interact with the syntax. He identifies two separate semantic components of an idiom: the first component he refers to as its  $M_1$ , or its interpretation under an idiomatic reading: "the semantic representation of the predicate-component of the actual meaning of the idiom" (ibid.:329). The second component is its  $M_2$ , or the literal reading normally associated with the idiom's phonological components: "the semantic representation of the predicate-component of the idiom in its literal sense" (ibid.:329). For example, the  $M_1$  of *kick the bucket* is 'die', and the  $M_2$  is 'kick the bucket'.

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<sup>26</sup> Although Katz (1973) appears in published form later than Fraser (1970), Fraser cites an early unpublished mimeograph of the former as Katz (1968). It should be noted that Katz (1973:367-69) vigorously objects to Fraser's characterization of Katz (1968), claiming that Fraser mistakes Katz's position for Weinreich's. I have been unable to find a copy of Katz (1968) so as to assess this claim, but the two models are often conflated in the literature, e.g., in Gibbs & Nayak (1989:102).

Newmeyer's thesis is that the syntactic mobility of an idiom can be predicted by reference to whether both its  $M_1$  and its  $M_2$  semantically govern the transformation in question. His formulation is as follows: "a cyclic rule operates internally to an idiom only if *both*  $M_1$  and  $M_2$  [semantically] govern the rule in question." Cyclic rules are semantically governed,<sup>27</sup> applying to a predicate in a given cycle "only if the predicate in the highest clause in the domain of the rule has the requisite semantic properties" (ibid:329). Among the rules Newmeyer considers to be cyclic and thus governed include Passive, Unspecified Object Deletion, Conjunct Movement, Subject Raising, Tough Movement, and There Insertion. This last rule, which is governed by "intransitive verbs of existence and occurrence" (ibid.:334), is apparent in the derivation of (31b) from (31a):

- (31) a. A tragedy occurred.  
       b. There occurred a tragedy. (Newmeyer, ibid.(14b))

Newmeyer argues that if both the  $M_1$  and  $M_2$  of an idiom govern There Insertion, the idiom will accept it, as well. Compare *come to light* in (32), whose  $M_1$  ('appear') and  $M_2$  both govern There Insertion,<sup>28</sup> with *die* and *kick the bucket* in (33):

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<sup>27</sup> The notion of *governed* and *ungoverned rules* derives from Lakoff (1970 [1965]); governed rules permit lexical exceptions and are cyclic, whereas ungoverned rules (e.g., Topicalization, Particle Movement) do not permit exceptions, and are non-cyclic. Newmeyer adds that idioms uniformly resist the application of ungoverned rules (ibid:334-35). But if this is true and if Particle Movement is ungoverned, as Newmeyer suggests, we have no explanation for how Katz (1973) and Fraser (1970) could find *laid the law down* acceptable (see §2.2.2-3 above).

<sup>28</sup> In considering whether the  $M_2$  of *come to light* governs There Insertion, Newmeyer writes that in his dialect, *there came to visit three travelling musicians* is acceptable. This seems beside the point, as *come to visit* and [LIT] *come to light* are arguably quite different structurally. Indeed,

- (32) a. A new development came to light.  
       b. There came to light a new development. (Newmeyer, *ibid.*(15b))
- (33) a. An old man died.  
       b. \*There died an old man.  
       c. [ID/LIT] An old man kicked the bucket.  
       d. [\*ID/\*LIT] There kicked the bucket an old man.

In (33b,d), we see that as *die* does not govern There Insertion, neither does the idiom whose  $M_1$  semantic representation is equivalent to that of *die*. (The  $M_2$  of *kick the bucket* also does not govern There Insertion, as can be seen in the ungrammaticality of (33d) even under a literal reading.) Similarly, as *die* does not govern Passive (34b), idioms with an equivalent  $M_1$  do not, either (34d):

- (34) a. The old man died.  
       b. \*[The old man] was died.<sup>29</sup>  
       c. [ID/LIT] The old man kicked the bucket.  
       d. [\*ID/LIT] The bucket was kicked by the old man.

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Newmeyer offers relatively little evidence for his assertion that the  $M_2$  of an idiom must independently govern a rule for the idiom to accept it. I will return to this point in greater detail in subsequent sections, arguing that the  $M_1$  is sufficient to derive the observed immobility of such idioms.

<sup>29</sup> The “proper” ungrammatical form here (to the extent that this is a coherent notion) depends on one’s position on the Unaccusative Hypothesis (see §1.3.2); if *the old man* is an internal argument of *die*, then it advances to subject position either way, and the ungrammaticality is due only to the incompatibility of the passive morpheme with the unaccusative verb. If *the old man* is not an internal argument, then we have either a violation of the Theta Criterion if it *does* surface in subject position (as the passive suppresses the external theta role) or a violation of the EPP if it does not (i.e., if the sentence is simply \**Was died*).

The advantages of Newmeyer's account with respect to the learnability question should be apparent. If the two semantic representations of an idiom are directly predictive of its syntactic mobility, then idioms do not have to be idiosyncratically marked, whether for specific transformations they cannot undergo (as in Weinreich, 1969), for which of their components are or are not idiomatic / nonextractable (as in Katz, 1973), or for which level of the frozenness hierarchy they belong to (as in Fraser, 1970). An idiom's  $M_2$  is merely a compositional function of the literal meanings of its components, and its  $M_1$  must be available in the input in any case, in order for the child to learn what the idiom means.

The question, then, is whether Newmeyer's model is empirically sound. Are there any counterexamples to be adduced here? Nunberg (1978:212), despite expressing support for Newmeyer's ingenuity, notes that unlike *kick the bucket*, *give up the ghost*, whose  $M_1$  is arguably identical, nonetheless appears to retain its idiomatic meaning when passivized:

- (35) Once the ghost has been given up, there's nothing that medical science can do. (Nunberg, 1978(16))

Nunberg notes also that *pop the question* and *throw in the sponge*<sup>30</sup> can be passivized (ibid.:212), despite 'propose' and 'resign' not governing the passive. Conversely, he claims that *have a shot at*, which he paraphrases as 'try', does not passivize<sup>31</sup>:

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<sup>30</sup> The variant *throw in the towel* may perhaps be better known these days. A few pages later (ibid.:227), Nunberg appears to contradict himself by listing *throw in the sponge* in the class of *abnormally decomposable* idioms (see below), whose members he claims cannot passivize.

- (36) a. Bowling was tried by John  
 b. \*Bowling was had a shot at by John. (Nunberg, 1978(17))

Succeeding treatments of Newmeyer (1974) cite only Nunberg's *give up the ghost* counterexample in dismissing his framework.<sup>32</sup> In fact, despite an exhaustive search, the only other counterexamples I've been able to find in the literature are from Machonis (1985:300),<sup>33</sup> who claims that *get the show on the road*, which he paraphrases as 'start', can be passivized:

- (37) a. Once they got the show on the road, everyone seemed to be content.  
 b. Once the show was gotten on the road, everyone seemed to be content.

Similarly, Machonis claims that *tell tales out of school*, which he paraphrases as 'tell secrets', cannot passivize, despite the fact that *tell secrets* can:

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<sup>31</sup> Although the  $M_1$  of *have a shot at* governs the passive, its  $M_2$  does not, so Newmeyer would predict the same result as Nunberg finds here. As the idiom is ill-formed on a literal reading, I replace *shot* with *appointment* to demonstrate:

- i. John had an appointment at the health clinic.  
 ii. \*The health clinic was had an appointment at by John.

<sup>32</sup> E.g., Titone & Connine (1999:1656): "Unfortunately for this view [i.e., Newmeyer's], an isomorphic relationship between idiomatic meaning and syntactic function is not the case for all idioms (e.g., *gave up the ghost*; Nunberg, 1978)."

<sup>33</sup> Machonis concludes that "each idiom would have to be individually marked for this transformation [passivization] in the lexicon," which very much sounds like a return to the Weinreich's (1969) approach, although Machonis admits his partiality to the anti-generative position of Gross (1979).

- (38) a. Max is always telling tales out of school.  
 b. \*Tales are always being told out of school (by Max).

(Machonis, 1985(17-18))

The handful of counterexamples here would certainly doom Newmeyer's model if it was too rigid to account for them, as was Fraser's model above. But Newmeyer's approach does not suffer from the same deficiency as Fraser's hierarchy: an apparent counterexample may only indicate that a given idiom has a different  $M_1$  semantic representation in the mind of an individual speaker. For example, a speaker for which *the ghost was given up* retains its idiomaticity might paraphrase it as transitive 'accept death' or 'relinquish the spirit', rather than unaccusative 'die'.<sup>34</sup>

- (39) a. *For Speaker A (who rejects the passive):*

\*Once the ghost was given up. . .

$M_1$ : 'die'

- b. *For Speaker B (who accepts the passive):*

Once the ghost was given up. . .

$M_1$ : 'relinquish life'

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<sup>34</sup> Indeed, Nunberg (1978) is on the verge of this conclusion elsewhere in the same work: "We normally refer to dying with die as if it were a change in the state of a single individual. But we can also identify death as a two-place relation, which holds between persons and their spirits, or between souls and bodies. Then given give up the ghost. . . there is a function from ghosts to spirits, and from the act of giving something up to the act of relinquishing one's hold on the spirit." (ibid.:222-23). However, Nunberg does not appear to connect this reappraisal of *give up the ghost* to his previous dismissal of Newmeyer's model.

Likewise, Machonis's (1985) counterexample is explicable in terms of idiolectal variation in the idiom's  $M_1$ :

(40) a. *For Speaker A (who rejects the passive):*

\*Once the show was gotten on the road. . .

$M_1$ : 'start'

b. *For Speaker B (who accepts the passive):*

Once the show was gotten on the road. . .

$M_1$ : 'start the process/event'

Similar solutions (*mutatis mutandis*) can explain why one speaker might accept the passives of *pop the question* and *throw in the sponge*, where another speaker might reject them. As for *tell tales out of school*, which strikes me as especially bad in the passive (as in (38b) above), I think it's more plausible that the  $M_1$  for most speakers is not 'tell secrets', but rather something like 'gossip'.

As I see it, Newmeyer's model has two key features that justify resurrecting it.<sup>35</sup>

The first I have already mentioned: if the semantic representation(s) of an idiom are directly predictive of its syntactic mobility, then idioms do not have to be idiosyncratically marked for the transformation which they cannot undergo; all the information that a child needs to decide on the syntactic mobility of an idiom is already

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<sup>35</sup> It will however need to be heavily modified to fit into the quite different theoretical landscape of the moment, as I attempt to do in §2.3 and in Chapter 4 here. Newmeyer originally implemented his model by positing a transderivational constraint, in which a derivation involving an idiom must refer to the phrase markers associated both with  $M_1$  and  $M_2$  during the application of the cyclic rules (ibid.:§3). Such constraints were soon anathema in syntactic theory, and Newmeyer (p.c.) never attempted to update the implementation of his model.



present in the input. In particular, the  $M_1$  meaning of the idiom must be independently educible from the input in any model, in order for the child to learn what the idiom means.

The second laudable feature of Newmeyer's model addresses a problem particularly vexing for idiom researchers: almost all discussions of the syntactic mobility of idioms are confounded by what seems to be a markedly greater lability in acceptability judgements than is present in judgements of other grammatical phenomena.<sup>36</sup> As such, one finds a great profusion of marginal cases in the literature, and disagreements about whether this or that idiom allows this or that transformation. Any account of how idioms are represented in the lexicon must reckon with this, and indeed should provide a straightforward, relatively nonstipulative explanation for how such idiolectal variation can be instantiated. In Newmeyer's model, the solution is simple: different learners posit different  $M_1$ s for the same idiom in the process of acquisition. Given that a vector for the observed variation is (implicitly) built in here, the position that an idiom's  $M_1$  directly constrains its syntactic mobility is due for a reexamination, to which I will return in §2.3.

### *2.2.5 A semantic-pragmatic-lexical account*

The work of Nunberg and colleagues (Nunberg, 1978; Nunberg, Sag, & Wasow, 1994) has been significantly more influential than that of Newmeyer's, at least in some circles, and so deserves discussion here. Nunberg et al. (ibid.:531) argue that the syntactic

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<sup>36</sup> This is really just anecdotal/impressionistic, but would make for an interesting study. Note also the possibility of metalinguistic or poetic alterations; see Langlotz (2006) on the subject of idiomatic creativity, and §2.4 here for more on metalinguistic extensions of idioms.

mobility of an idiom is predictable in terms of the “compatibility of its semantics with the semantics and pragmatics of various constructions.” This line of argument stems from Nunberg (1978), who classifies idioms based on their semantic *decomposability*. In *nondecomposable idioms* such as *kick the bucket*, the phonological components of the idiom cannot be mapped to separate elements of the idiomatic meaning (in this case, ‘die’), and thus no speaker would ever have cause to separate them. This explanation of the immobility of such idioms differs from Newmeyer’s in that Nunberg is not positing a semantic constraint directly on the syntax, but instead on pragmatics: “if there is no assurance that hearers will be able to identify the referent of the focussed [sic] NP [i.e., *the bucket*], then it makes no sense to focus on it” (ibid.:225).<sup>37</sup>

In *decomposable idioms* such as *spill the beans*, on the other hand, the individual surface components map directly to components of the idiom’s meaning, here ‘reveal’, ‘the’, and ‘secret’. Such idioms:

[R]efer to a state or activity such that it would be normally believed that that activity could be identified as an open relation  $Rxb$ , such that the object NP of the idiom refers to  $\underline{b}$ , and the verb to  $R$  [with  $x$  = the subject NP] (ibid.:221).

Thus, situations in which it would make pragmatic sense to highlight ‘the secret’ are possible, and so *the beans* can be displaced. However, decomposability is not

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<sup>37</sup> Nunberg appears to be using the term “focus” in a general sense, i.e., not strictly in its information-structure sense: “It is universally agreed that speakers use passives when they want to ‘focus’ on the logical object of the verb. . . usually de-focussing [sic] (etc.) the logical subject in the process.” Nunberg admits, however, that “critics are justified in pointing out that there is little agreement over what regularities ought to follow once we have focussed on something” (ibid.:218).

deterministic, as some decomposable idioms do *not* passivize; Nunberg cites *make tracks* ('leave hastily') as such an idiom:

(41) ?Tracks were made by the robbers as soon as they saw the patrol car.

(ibid.(29))

To take care of decomposable idioms that do not passivize, Nunberg (1978) divides these idioms into *normally* and *abnormally decomposable* categories. An idiom is *normally decomposable* when "it is analyzed as involving only conventions whereby each of its constituents can be used to refer to the constituents of its referent" (ibid:226). Normally decomposable idioms include *spill the beans*,<sup>38</sup> *pop the question*, and *break the ice*; these idioms readily passivize.

An idiom that is *abnormally decomposable*, on the other hand, depends on mapping parts of the idiomatic meaning to a conventionalized metaphor. For these idioms "we can identify the referents of their constituent terms, but it is only in virtue of our knowledge of conventional metaphors that we know what that relation is invoked to identify" (ibid:228). Abnormally decomposable idioms include *make tracks*, *throw in the sponge*, and *carry a torch for X*. To take the latter idiom as an example, *carry a torch for X* ('maintain a love for X'), it is only via our knowledge of the conventional metaphor AFFECTION IS HEAT that we can decompose the idiom, and understand *torch* as 'love' (Gibbs, Bogdanovich, Sykes & Barr, 1997). Nunberg claims that such idioms resist

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<sup>38</sup> Gibbs & Nayak (1989), however, list this as an abnormally decomposable idiom.

passivization not because they are nondecomposable (as e.g. *kick the bucket*), but because the object NP:

[D]oes not itself refer to some component of the idiomatic referent, but only to a component of the relation by means of which that referent is conventionally identified. . . it is irrational to produce that NP in a sentence position . . . for terms whose referents are “in focus” in the discourse (Nunberg, 1978:228).

Although the distinction between abnormally and normally decomposable idioms motivated some psycholinguistic work over the next decade or so (see e.g. Gibbs, Nayak, & Cutting, 1989), the psychological reality of such a dichotomy has been questioned (Titone & Connine, 1994), and it has largely been abandoned otherwise. In fact, the distinction is not even mentioned in Nunberg, Sag, and Wasow (1994), where the three discrete categories outlined in Nunberg (1978) have been collapsed into two:

*idiomatically combining expression* (ICEs) are idioms “whose parts carry identifiable parts of their idiomatic meanings,” and *idiomatic phrases* (IPs) are idioms “whose idiomatic interpretations cannot be distributed over their parts” (Nunberg et al., 1994:496-97); these terms replace “decomposable” and “nondecomposable” respectively.

The reason for this retreat is not made explicit, but the overall discussion seems to point to Nunberg et al. no longer viewing the two classes as discrete, or their characterizations as fully predictive of the syntactic mobility of their members. Even the twofold distinction between decomposability and nondecomposability is only part of the picture:

[I]nteracting factors, mostly having to do with the nature of the discourse function of particular constructions and the particular figures underlying various idiomatic combinations, have a critical role to play as well (ibid.:509).

For idiomatically combining expressions (henceforth ICEs), Nunberg et al.'s position is that they consist of a figurative co-occurrence dependency between lexemes, such that, e.g., an interpretation of *beans* as 'secret' is dependent on a concurrent interpretation of *spill* as 'reveal'. ICEs are not then idioms in the sense that this term is generally understood, but rather metaphoric usages of the lexemes in questions; the only difference between these and the more general category of metaphors is that these are conventionalized in terms of a semantic dependency between two lexical items. As with any lexical item, such idioms can be passivized only insofar as one of these components "makes sense" to highlight in a given discourse context.

This is because Nunberg et al. view the passive as "a lexical regularity that holds between a pair of lexical forms (say, a base form and its corresponding passive participle)" (ibid.:508), not as a transformationally derived structure.<sup>39</sup> This is a view derived from Construction Grammar,<sup>40</sup> wherein constructions, like lexical items, may have associated meanings (Fillmore & O'Connor, 1988; Goldberg, 1992). The meaning of an ICE thus interacts with the meaning of the passive construction in an idiosyncratic

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<sup>39</sup> Much of Nunberg et al.'s paper consists of an effort to demonstrate that idioms "provide no evidence bearing one way or the other on . . . syntactic issues" such as transformations / movement, the existence of separate levels of a derivation, syntactic realizations of thematic roles, etc. I will look at some of these arguments in Chapter 4 when I consider lexical insertion.

<sup>40</sup> Similar "superlexicalist" ideas are apparent also in Lexical-Functional Grammar (e.g., Bresnan 1978, 1982).

manner derived from the idiosyncratic figuration underlying the ICE, which may or may not be compatible with the meaning of the passive.

For idiomatic phrases, however, Nunberg et al. maintain that an idiom like *kick the bucket* is simply an “idiosyncratic type of phrasal construction that is assigned its own idiomatic meaning” (ibid.:507). IPs have the same syntactic structure as any other verb phrase, and indeed, are a subtype of the construction type “verb phrase.” A sentence in which *kick the bucket* occurs thus is normal with respect to such issues as agreement, wherein the head of the phrase (here *kick*) agrees with respect to external elements (tense, the phi-features of the subject, etc.). However, *kick the bucket* cannot passivize simply because only its active form is listed in the lexicon. The specifics of this argument are perhaps worth quoting in full here:

Since the idiomatic interpretation of *kick the bucket* arises only from the definition of a type of phrasal construction, there is simply no mechanism in the grammar of English that assigns the idiomatic interpretation to the passive sentence, which can be derived only from a passivization of the verb *kick*, which means only ‘kick’, not ‘die’. Likewise, topicalization or clefting of *the bucket* is impossible, as this would involve assigning particular discourse roles to (the denotation of) an element that, except when it appears within instances of the idiosyncratic VP-construction type, can only refer to a contextually determinate bucket (ibid.:508).<sup>41</sup>

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<sup>41</sup> A similar argument is apparent in Pulman (1993:268-69), who argues that passivized, clefted, and topicalized idioms are possible only insofar as they occur in a discourse context in which “it makes sense to focus or contrast the discourse entity.” For an idiom like *kick the bucket*, however,

There is a significant overlap in terms of the approaches taken by Newmeyer (1974) and Nunberg and colleagues. In both cases, we see the same basic insight, viz. that the phonological component *the bucket* in *kick the bucket* has no interpretive reflex, but that the component *beans* in *spill the beans* does, and that the semantic representations of these idioms therefore need not directly encode idiosyncratic constraints on mobility. Where they differ, however, is in their implementation of this dichotomy.

As we have seen, Newmeyer argues that an idiom's semantic representation directly constrains its syntactic mobility. Nunberg et al.'s account differs in that they are not positing a semantic constraint directly on the syntax, but instead on the lexicon via pragmatics; the passive of *kick the bucket* does not exist because no discourse situation exists that would justify such a form being uttered. Does *the bucket was kicked* sound odd because one would never have cause to utter it, and thus would never hear it? Or do the semantics of this idiom rule out the raising of an object NP where it has no interpretive reflex?

Clearly, deciding between these two accounts depends on one's approach to the generation of passive sentences, as well as the extent to which one wishes to admit pragmatic considerations into syntactic theory.<sup>42</sup> However, neither is the topic of this dissertation. The case for derived subjects in passives has been extensively argued elsewhere, going back to *Syntactic Structures* (Chomsky, 1957:§5.4), and if UTAH (Baker, 1988) is essentially correct in that "identical thematic relationships between items

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*the bucket* "does not correspond to any discourse entity." This observation, it seems to me, is empirically equivalent to the observation that *the bucket* is syntactically and semantically inert, and so cannot in any meaningful sense refer to *any* entity. This is a function of the argument structure of its M<sub>1</sub>, and reflects precisely the argument made by Newmeyer.

<sup>42</sup> See Newmeyer (1986:Chap. 5) for the history of this latter question.

are represented by identical structural relationships between those items” at some underlying level,<sup>43</sup> then to the extent that the subject of a passive sentence bears the same theta role as the object of its corresponding active sentence, it must therefore be a derived subject. Unless we are prepared to jettison this from the theory, Nunberg et al.’s account remains wanting of an explanation for how an idiom’s semantic representation can constrain its syntactic mobility.

#### 2.2.6 Jackendoff’s and Horn’s semantic-syntactic accounts

An approach that bears some similarities both to Newmeyer (1974) and to Nunberg et al. (1994) is that of Jackendoff (1997b, 2002). Jackendoff notes that syntactically mobile idioms have a property he refers to as “metaphorical semantic composition” (Jackendoff, 1997:168), a similar construct to that of Nunberg’s (1978) “decomposability”. For example, the meaning components of the idiom *bury the hatchet* (‘reconcile a disagreement’) can be broken into “subidiomatic” chunks which correspond metaphorically to the phonological components of the idiom. Jackendoff, whose lexical entries he refers to as *Lexical-Conceptual Structures* (LCSs), posits the following LCS for *bury the hatchet*:

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<sup>43</sup> See §1.3.1 for assumptions of this dissertation concerning UTAH.



- (42) PHONOLOGY:      $_a \text{bury } _b \text{the } \text{hatchet}$
- SYNTAX:              $_a \text{V}_x \quad \text{NP}_y$   
                                $\wedge$   
                                $_b \text{D} \quad _c \text{N}_{[+\text{count}, +\text{sing}]}$
- SEMANTICS:          $[\text{RECONCILE} ([\_\_\_]_A, [\text{DISAGREEMENT}]_y)]_x$
- (adapted from Jackendoff, 1997(23))

The indices in (42) serve to connect the syntactic structure of the idiom with its phonological and semantic structures.<sup>44</sup> Key to Jackendoff's formulation is that although the semantic structure is composed of a single unit, both the phonological and syntactic components are separable; there is no stipulated VP constituent, and so the NP *the hatchet* can appear anywhere that any other underlying object can, provided that it heads a chain that is assigned a theta role in the VP. Thus *bury the hatchet* can be passivized, or even appear in a raising structure:

- (43) The hatchet seems not to have been buried yet by those skaters.
- (Jackendoff, 1997b(22a))

On the other hand, for an idiom like *kick the bucket*, "there is no possibility of distinguishing *the bucket* as an argument in the LCS" (ibid.:169), as it has no independent meaning and therefore is not assigned a theta role. Jackendoff represents the LCS for *kick the bucket* as follows:

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<sup>44</sup> Jackendoff represents the idiom phonemically in the IPA here, along with autosegmental information; I represent it here only orthographically. Note also that the index represented by the capital A in the semantic structure refers to the external argument.

(44) PHONOLOGY:     *<sub>a</sub>kick <sub>b</sub>the <sub>c</sub>bucket*

SYNTAX:                VP  
                                $\wedge$   
                               <sub>a</sub>V<sub>x</sub>    NP  
                                        $\wedge$   
                                       <sub>b</sub>D   <sub>c</sub>N

SEMANTICS:           [DIE ([   ]<sub>A</sub>)]<sub>x</sub>

(adapted from Jackendoff, 1997b(24))

Here, *the bucket* is linked to *kick* directly via its syntactic structure, not via theta assignment.

Finally, Jackendoff notes that some idioms have a metaphorical semantic composition but nonetheless fail to passivize. One example he gives is *raise hell*, which is decomposable into chunks but nonetheless fails to passivize:

(45)    *raise hell* = ‘cause’ ‘a serious disturbance’

\*Hell was raised by Herotodus. (adapted from Jackendoff, 1997b(25))

Jackendoff writes that for such idioms, “despite their semantic decomposition, they are lexical VPs rather than a collection of syntactic fragments” (ibid.:170). He therefore concludes that although metaphorical semantic composition is a necessary condition for mobility, it is not a sufficient one.

What sort of lexical entry should be assigned, then, to an idiom like *raise hell*: an LCS like (42) for *bury the hatchet*, or like (44) for *kick the bucket*? Working explicitly within Jackendoff’s framework, Horn (2003) proposes the property of *thematic*

*composition* to replace Jackendoff’s metaphorical semantic composition. An idiom has thematic composition if “the thematic structure of the verb in its literal sense and that of the verb in its idiomatic sense are identical,” defining *thematic structure* as “the set of semantic roles that a verb assigns to its NP arguments.” Horn argues that *raise hell* lacks thematic composition: “*raise* in its literal sense and [cause/bring about] have different thematic structures” (ibid.:249).<sup>45</sup> It should thus be accorded a lexical entry similar to that for *kick the bucket*, rather than *bury the hatchet* (my formulation):

(46)	PHONOLOGY:	${}_a\text{raise } {}_b\text{hell}$
	SYNTAX:	$  \begin{array}{c}  \text{VP} \\  \wedge \\  {}_a\text{V}_x \quad {}_b\text{NP}_y \\  \quad \quad   \\  \quad \quad \text{N}  \end{array}  $
	SEMANTICS:	$[\text{CAUSE } ([\_\_\_\_]_A, [\text{DISTURBANCE}]_y)]_x$

In an attempt to establish that thematic composition is a sufficient condition for mobility, Horn looks at a number of independent factors which obscure the correlation between the two. For example, he claims that although *get a bum rap* (‘receive false blame’) fails to passivize, as in (47a), this is because *get* independently fails to passivize in literal sentences like (47b)<sup>46</sup>:

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<sup>45</sup> Given Horn’s definition of “thematic structure,” this claim appears to be based on ‘hell’ and ‘disturbance’ bearing different semantic roles, which seems unlikely. In fact, I find (45) at least marginally acceptable.

<sup>46</sup> This is precisely like Newmeyer’s requirement that an idiom’s  $M_2$  representation must independently govern a given transformation for it to be felicitous. I am not convinced this is necessary; see §2.3.2, where I reassess *get a bum rap*, concluding that *get* is not part of the idiom *a bum rap*—which is not a phrasal idiom, but a lexical idiom.

- (47) a. ?\*A bum rap was gotten by him.  
 b. ?\* A new book was gotten by Bill.

(Horn, 2003(34-35))

Horn argues also that although many idioms seem to resist WH- movement, this is for independent reasons as well: “they can have no independent reference in their idiomatic meanings and cannot be questioned as independent constituents” (ibid.:265). This may be true, but notice also that in Horn’s examples in (48), the determiner that is part of the phonological structure of the idiom has been replaced by *which*:

- (48) a. [\*ID/LIT] Which hatchet was buried by the Israelis and Palestinians?  
 b. [\*ID/LIT] Which beans did Harry spill?

(adapted from Horn, 2003(33b-c))

These examples are infelicitous with an idiomatic interpretation, then, simply because the structural description of the idiom is not met; this is the same reason *\*spill some beans* or *\*bury a hatchet* would be infelicitous.

Although neither Jackendoff nor Horn cites Newmeyer (1974), their approaches point towards a possible synthesis of Newmeyer’s and Nunberg et al.’s (1994) models. Key to this is Horn’s notion of thematic composition, which in Newmeyer’s terms means that for an idiom that has this property, its M<sub>1</sub> and M<sub>2</sub> are equivalent in terms of the theta roles involved. These idioms seem to correspond to Nunberg et al.’s idiomatically

combining expressions; specifically, those which Nunberg (1978) labelled as “normally” decomposable.

For idioms which lack thematic composition, there is a mismatch between  $M_1$  and  $M_2$ . What, then, determines which theta roles are involved in such idioms? Three possibilities are apparent: either the idiom has the same thematic structure as its  $M_1$ , the same thematic structure as its  $M_2$ , or it has a fully arbitrary thematic structure. This will be the topic of the next two sections.

### *2.3 Semantic constraints on syntactic mobility*

In this section, I consider thematic structure in some phrasal idioms and its possible sources, demonstrating that an idiom assigns the same theta roles as a carefully elaborated paraphrase of its figurative reading, which is generally distinct from the theta roles assigned under a literal reading of the idiom’s components. Indeed, I argue that the semantic values associated with the literal interpretation of an idiom are semantically inert in the context of language production, and that the semantic representation of an idiom under a figurative reading is sufficient to derive the constraints on its syntactic mobility.

#### *2.3.1 Thematic structure in idioms: A ghost in the machine*

In addition to syntactic information, idioms, like all lexical items, have two chief components: a phonological form and a semantic structure. The semantic structure is the

conceptual meaning of the lexical item; for idioms, this is what Newmeyer (1974) refers to as the  $M_1$ . Although the semantic structure can be paraphrased, it is presumably otherwise abstract, which makes describing its contents quite problematic.<sup>47</sup> Paraphrase, like synonymy, is a slippery business, and so for the paraphrase to have any empirical value, it must be carefully elaborated. For example, *give up the ghost* is commonly paraphrased simply as ‘die’, but there are aspects of its structural meaning not included in this paraphrase. Unlike *die* in (49a), it cannot (at least in my idiolect) occur in a punctual context (49b), but must occur in a context in which a gradual death is indicated (or at least not counter-indicated), as in (49c):

- (49) a. Despite being in perfect health, John suddenly died.
- b. \*Despite being in perfect health, John suddenly gave up the ghost.
- c. Over the last few weeks, John’s condition had worsened, and last Friday he finally gave up the ghost.

The lexical entry must somehow encode this information as part of the semantic structure. One way to do this<sup>48</sup> is to paraphrase the idiom’s  $M_1$  as having multiple components: one component meaning ‘die’, and another meaning ‘gradually’:

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<sup>47</sup> Newmeyer (ibid.:329) admits as much: “if the notion ‘meaning of a lexical item’ is an obscure one, the notion ‘meaning of an idiom’ is even more so.” Nunberg et al. (1994:506) go so far as to assert that “no exact paraphrases of [idioms] exist,” although they offer no support for this claim.

<sup>48</sup> In Chapter 3, I move to using binary features such as [+/- DURATIVE] to represent the aspectual properties of idioms.

(50) M<sub>1</sub>: ‘die’ ‘gradually’

Unlike the idiom’s M<sub>1</sub>, the phonological form (PF) of an idiom is directly available. It is usually not fixed, but rather is sensitive to morphosyntactic context. In the presence of a past Tense head, for example, *give up the ghost* is realized as ***gave** up the ghost*.

So far, the lexical entry for *give up the ghost* (putting aside for now the issue of irregular morphology) contains the information in (50’):

(50’) M<sub>1</sub>: ‘die’ ‘gradually’

PF: *give up the ghost*

This is not, of course, a complete lexical entry. We know from (50’) what the idiom means (in isolation), and how to pronounce it, but we do not know how to insert it into a sentence. It has no category label, and we have no idea of its thematic structure. Compare these (plausible, I think) lexical entries for the predicates *die* and *give up*<sup>49</sup>:

(51) M<sub>1</sub>: ‘die’ [EXPERIENCER]

PF: *die*

SYN: Verb [\_\_PROTO-PATIENT]

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<sup>49</sup> A minor terminological point: Newmeyer defines M<sub>1</sub> as “the semantic representation of the predicate-component of the actual meaning of the **idiom**”; here I extend the use of M<sub>1</sub> to refer to the semantic structure of non-idiomatic predicates such as *die*.

(52) M<sub>1</sub>: [AGENT] ‘give up’ [THEME]

PF: *give up*

SYN: [PROTO-AGENT\_\_] Verb [\_\_PROTO-PATIENT]

The lexical entries for *die* and *give up* have a syntactic component SYN in addition to their semantic and phonological components; this includes a category label, which determines possible insertion sites, as well as any theta roles that the predicate has to discharge. For *die* and *give up*, the theta roles referenced in the syntactic component are determinable on the basis of the semantic structure. The clustering of semantic properties that make up *Experiencer*, for example, have the consequence that the predicate assigns the *Proto-Patient* theta role.<sup>50</sup> Note that although this is syntactic information, it is derived from the semantic structure of the predicate. Thus, arguments which do not satisfy the specific clustering of thematic properties underlying a given instance of Proto-Agent or Proto-Patient, yield a result that is not ungrammatical, but merely semantically anomalous:

(53) a. #The bowling ball died. [not sentient]

b. #The ottoman gave up meat for Lent. [not volitional or sentient]

Certainly, an idiom must have such a component as well. The question is, where does this information come from?

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<sup>50</sup> See §1.3.1 for assumptions of this dissertation concerning theta theory.



It would seem that there are two main possibilities: either it is derivative, or it is arbitrary. If derivative, two possible sources are apparent: either the semantic component of the idiom (its  $M_1$ ), or the semantics associated with the components of its phonological form under a literal, fully compositional reading (its  $M_2$ ).

On an *a priori* basis, it would seem quite odd for the semantics associated with the literal interpretation of an idiom to be the source of the thematic structure of the idiom. After all, the synonymy (for present purposes) of the sentences in (54) below suggests that they should share truth conditions; (54a) and (b) are both true in a world where John died after fruitless medical interventions, and false in a world where he did not:

- (54)    a. The doctors did all they could, but in the end John died.  
           b. The doctors did all they could, but in the end John gave up the ghost.

If these sentence share the same truth conditions, then the arguments involved should have corresponding theta roles. Dowty (1991:563) underlines this point: “any truth-conditionally equivalent sentence has the same role assignments. The nature of the . . . event itself, it seems, fixes these roles.” We would therefore expect *die* and *give up the ghost* to assign the same theta roles.

What about the  $M_2$  of *give up the ghost*? In order to get a literal interpretation of its phonological components, we need a somewhat more fantastical context:

- (55) [LIT] The dastardly dwarf had been hiding Casper in his attic, but once the search warrant was presented, he abruptly gave up the ghost.

The external argument of *give up* in its literal sense shows at least three of the contributing properties for Dowty's Proto-Agent theta role (ibid.:572): *volitional involvement in the event or state, sentience (and/or perception)*, and *causing an event or change of state in another participant*. For example, it clearly entails a volitional involvement, as it can appear as an infinitival complement of *try* as in (56):

- (56) [LIT] The dastardly dwarf tried to give up the ghost to prevent a bloodbath, but the police stormed his house anyway.

The idiom is different. Its subject argument shows none of the contributing properties for the Proto-Agent theta role.<sup>51</sup> Although the subject is sentient, Dowty notes that *sentience (and/or perception)* as a contributing property “means more than a presupposition that an argument is a sentient being; it is rather sentience with respect to the event or state denoted by the verb” (ibid.:573). Dowty gives examples like *nominate* and *idolize*, the object arguments of which, though likely sentient in and of themselves, are not entailed to be sentient with respect to the verb; one may be idolized without being aware of it.

Instead, the subject argument of the idiom *give up the ghost* shows at least one, and possibly two, of the contributing properties for the Proto-Patient theta role:

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<sup>51</sup> Although this argument arguably shows *independent existence*, Dowty expresses doubt as to whether this should really be considered a contributing property (ibid.:572), and so I don't consider it here. See §1.3.1 and fn. 7.

*undergoes change of state, and causally affected.*<sup>52</sup> It is certainly unacceptable in a volitional context:

(57) [\*ID] Exhausted by his suffering, John tried to give up the ghost.

This suggests that the subject argument of the idiom *give up the ghost*, which is non-volitional, bears the Proto-Patient theta role; the idiom is unaccusative, and has no external theta role to assign. Dowty writes that “the most important property for the unergative/ unaccusative contrast seems to be volition,” and that intransitives with volitional, sentient arguments are “ALWAYS unergatives” (ibid.:607; emphasis in original). They therefore always assign the Proto-Agent role. Unaccusatives, on the other hand, will always have non-volitional arguments and thus will assign the Proto-Patient role.<sup>53</sup>

It seems clear from the contrast between (56) and (57) that the M<sub>2</sub> associated with a literal reading of this idiom’s phonological components cannot be the source for its thematic structure; the idiom assigns the Proto-Patient role, whereas its M<sub>2</sub> assigns the Proto-Agent role. Instead, *give up the ghost* has the same thematic structure as *die*. I therefore provisionally represent the lexical entry for the idiom *give up the ghost* as follows, repeating also the lexical entries for *die* and *give up* for comparison:

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<sup>52</sup> Dowty’s contributing properties for Proto-Agent and Proto-Patient are framed in terms of argument selection for transitive verbs, and so the contributing property in question is phrased as “causally affected by another participant”; his discussion on intransitives does not make it clear how this condition is to be interpreted when there is only one argument.

<sup>53</sup> I assume in this dissertation that the distinction between unergativity and unaccusativity is syntactic, and thus that the Proto-Patient role is always assigned internal to the VP; see §1.3.2. It should be noted however that Dowty (1991) is quite skeptical of extending this semantic distinction to the syntax; see his fn. 15 and §12 for discussion.

(58) M<sub>1</sub>: ‘die’ [EXPERIENCER]

PF: *give up the ghost*

SYN: Verb [\_\_PROTO-PATIENT]

(59) M<sub>1</sub>: ‘die’ [EXPERIENCER]

PF: *die*

SYN: Verb [\_\_PROTO-PATIENT]

(60) M<sub>1</sub>: [AGENT] ‘give up’ [THEME]

PF: *give up*<sup>54</sup>

SYN: [PROTO- AGENT\_\_] Verb [PROTO-PATIENT]

Note that in (58), *the ghost* is not assigned a theta role; the only theta-role involved is the Proto-Patient role, which is assigned to the argument that appears in (derived) subject position. As a consequence, *the ghost* cannot be displaced; in Horn’s (2003) terms, this is because the idiom lacks thematic composition, in that “the thematic structure of the verb in its literal sense and that of the verb in its idiomatic sense” (ibid.:249) are *not* identical.

It would seem, therefore, that the syntactic information in (58) *cannot* be derived from the normal semantic values associated with the idiom’s phonological components. We have therefore excluded the possibility that the thematic structure of an idiom is determined by its M<sub>2</sub>. (There remains the possibility that it is fully arbitrary, which will be addressed in the following section.) Instead, our consideration of this one idiom

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<sup>54</sup> *Give up* has a transitive variant, as in *John gave up* (‘John surrendered’). I ignore this here.

suggests that the  $M_1$  of the idiom operates like a “ghost in the machine”: it is an unseen internal force that guides the external behavior of the idiom.<sup>55</sup>

### 2.3.2 Thematic structure in a range of idioms with the $M_1$ ‘die’

We have seen that the thematic structure of *give up the ghost* differs from that involved in a literal reading of its phonological form, and that in fact it has the same thematic structure as *die*. However, if thematic structure is a fully arbitrary property of idioms, this may merely be a coincidence. Do all idioms that mean ‘die’ have the same thematic structure? If this can be demonstrated, we can conclude that the semantic representation of an idiom—its  $M_1$ —is the source of this information. Where the thematic structure associated with an idiom’s  $M_1$  fail to coincide with the thematic structure of its  $M_2$ , the idiom lacks the property of thematic composition (Horn, 2003), and should therefore be syntactically immobile.

So let’s see how many ways there are to report the death of our long-suffering John:

- (61) a. John kicked the bucket
- b. John bought the farm.
- (62) a. John bit the dust.
- b. John bit the big one.

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<sup>55</sup> The lexical idiom *ghost in the machine* comes from the philosopher Gilbert Ryle, who used it to satirize Cartesian mind-body dualism (Ryle, 1949). However, I admit that my initial exposure to it comes from the title of the 1981 album by The Police, whose opening track is appropriately titled “Spirits in the Material World.”

- (63) a. John breathed his last.  
 b. John cashed in his chips.  
 c. John turned up his toes.  
 d. John fell off his perch.
- (64) a. John paid the ultimate price.  
 b. John made the ultimate sacrifice.  
 c. John laid down his life.
- (65) a. John went to the great beyond.  
 b. John went to a better place.  
 c. John went to Davy Jones's locker.<sup>56</sup>  
 d. John went to that great hunting ground in the sky.  
 e. John went to meet his maker.  
 f. John went to his reward.  
 g. John went to his grave.  
 h. John passed (on / away / Ø).
- (66) a. John joined the choir invisible.  
 b. John took the last train to glory.  
 c. John shuffled off this mortal coil.
- (67). a. John gave up the oxygen habit.  
 b. John came to a sticky end.  
 c. John assumed room temperature.

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<sup>56</sup> Used to refer to a nautical death, the M<sub>1</sub> of this idiom might be better paraphrased as 'drown' or perhaps 'die in the water'.

- d. John is taking a dirt nap.<sup>57</sup>
- e. John is swimming with the fishes.
- f. John is pushing up daisies.

I have roughly arranged these into categories based on potentially salient properties. For example, the idioms in (63) all involve a possessor coindexed with the subject argument, the idioms in (65) all involve movement of some kind, most with *go* and either a location or goal (under a literal reading, that is), and the idioms in (67) are all especially jocular. Due to the great number of idioms here, I will consider only one idiom from each category in most of what follows, assuming that they are more or less representative of the category as a whole.

The initial question will be whether the surface subject arguments of these idioms possess any of the contributing properties associated with Dowty's (1991) Proto-Agent theta role. First, do any of them show evidence of volition? My diagnostic again here is whether an idiom is felicitous as an infinitival complement to *try*:

- (68) a. \*Exhausted by his suffering, John tried to kick the bucket.
- b. \*After years of depression, John tried to bite the dust.
- c. \*When his wife left him for a mailman, John tried to breathe his last.
- d. ?At the Battle of the Bulge, John tried to pay the ultimate price.
- e. \*With nothing left to live for, John tried to join the choir invisible.

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<sup>57</sup> It's unclear to me whether this idiom as well as the following two are really phrasal idioms, i.e., whether *be* is part of the idiom or not. If it is, I believe it is not progressive *be*, but rather copular *be*; to *be pushing up daisies* is to 'be dead', not to 'die'.

- f. \*In a fit of self-loathing, John tried to give up the oxygen habit.
- g. \*Weighed down by the vicissitudes of life, John tried to pass away.

I find (68d) marginally acceptable, as when we perceive someone as having sacrificed their life for some cause, it seems we tend to want to ascribe volition to the act (although in actual fact they may have been coerced). However, such idioms are used even when soldiers die in training exercises, wherein they had no intention of sacrificing themselves in the moment.<sup>58</sup> I think it's clear that not even the idioms in (64) necessarily *entail* volition of their arguments.

The next contributing property to consider is *sentience (and/or perception)*. As noted in the previous section, Dowty writes that it is not enough for the argument to refer to a sentient being; the property rather refers to “sentience with respect to the event or state denoted by the verb” (ibid.:573). This property is closely tied to volition (indeed, may be entailed by it). As one may die without being aware of it (e.g., in one's sleep), it seems that none of these idioms entail this property of their arguments.

Next, we have *causing an event or change of state in another participant*. The sacrificial idioms in (64) are again the only ones that stand out here, as when one sacrifices oneself, the putative notion is that others may benefit from it. However, outside of a very specific context (e.g., as in the literal interpretation of *John took a bullet for*

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<sup>58</sup> For example, an article in the *LaCrosse [Wisconsin] Tribune*: “OHS salutes those who paid ultimate price” (Erickson, 2014). Of nine alumni the high school remembers on its Wall of Honor, two died in training exercises and one by pneumonia.



*me*), any benefit is often quite indirect, and in any event the beneficiary is not an actual participant in the action.<sup>59</sup>

Finally, there is the property of *movement (relative to the position of another participant)*. To be sure, the idioms in (65) involve movement under a *literal* reading. Under an idiomatic reading, however, no such movement is entailed.<sup>60</sup> For those who believe that the soul both persists after death and also moves to a different location, such a belief might accompany the use of these idioms. However, the meaning of the idiom itself does not entail such a movement, and speakers may well use these idioms in the absence of such a belief.

As to contributing properties for the Proto-Patient role, these idioms seem to entail a *change of state* (Dowty specifically includes “coming into existence, going out of existence, and both definite and indefinite change of state” (ibid.:574)), and possibly *causally affected* (see fn. 52 above). Given that no Proto-Agent properties are entailed, we can therefore conclude that all of these idioms assign a Proto-Patient theta role to the argument, one that represents the same clustering of thematic properties as *give up the ghost* (and which I refer to here as *Experiencer*). Their lexical entries will look identical (for present purposes<sup>61</sup>), with only the phonological form varying:

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<sup>59</sup> See fn. 52 above on this point. Only in *take a bullet for X* is the beneficiary part of the argument structure of the idiom, and this idiom (like the similar *fall on X's sword*) does not actually entail that one dies, merely that one willingly suffers some loss in place of another party.

<sup>60</sup> See also fn. 34 above, and Nunberg (1978:222-23).

<sup>61</sup> These idioms may vary with respect to other properties, e.g. aspectual properties, as we will see in Chapter 3.

(69) M<sub>1</sub>: ‘die’ [EXPERIENCER]

PF: *kick the bucket / buy the farm / bite the dust / etc.*

SYN: Verb [\_\_PROTO-PATIENT]

As all the idioms which share (approximately) the same M<sub>1</sub> show evidence of the same thematic structure, we can therefore conclude that the thematic structure of an idiom is not an arbitrary property, but rather is directly derived from its semantic representation. Recall that where the thematic structure associated with an idiom’s M<sub>1</sub> fails to coincide with the thematic structure of its M<sub>2</sub>, the idiom lacks the property of thematic composition (Horn, 2003), and should therefore be syntactically immobile. In Table 1, I consider the thematic properties of the subject arguments under a *literal* reading of some of the idioms above.

*Table 1: Thematic properties of the literal readings of some idioms meaning 'die'*

Idiom’s M <sub>2</sub>	Proto-Agent entailments of subject argument	Proto-Patient entailments of subject argument
Buy the farm	Volition; sentience	-
Take the last train to glory	Volition; sentience; movement	Causally affected?
Pay the ultimate price	Volition; sentience	-
Give up the oxygen habit	Volition? sentience?	Change of state?
Join the choir invisible <sup>62</sup>	Volition; sentience	-
Go to a better place	Sentience; movement	-
Be pushing up daisies	Sentience? Causation?	Stationary?
Shuffle off this mortal coil	?	?
Come to a sticky end	Sentience; movement	-

<sup>62</sup> This of course only works under a literal reading if we allow for the postnominal adjective.

With some of these idioms, no literal reading is available, or is at best marginal. For these idioms, the  $M_1$  necessarily fails to coincide with the nonexistent or marginal  $M_2$ . For those with a plausible literal reading, it should be clear that all have more Proto-Agent entailments, and will be assigned the Proto-Agent role; the thematic structure of the  $M_2$  will therefore fail to coincide with the thematic structure of the  $M_1$ . All will therefore lack the property of thematic composition, and should (by Horn's hypothesis) be syntactically immobile. Let us briefly test this with the idioms from Table 1, using some of the transformations from Newmeyer (1974) and Fraser (1970):

(70) *Passivization.*

- a. John bought the farm.
- b. [\*ID/LIT] The farm was bought by John.
- c. John bit the dust.
- d. [\*ID/LIT] The dust was bitten by John.
- e. John took the last train to glory.
- f. [\*ID/LIT] The last train to glory was taken by John.

(71) *Particle Movement.*

- a. John is pushing up daisies.
- b. [\*ID/?LIT] John is pushing daisies up.
- c. John gave up the oxygen habit.
- d. [\*ID/?LIT] John gave the oxygen habit up.

(72) *Relativization:*

- a. John joined the choir invisible.

- b. [\*ID/?LIT] The choir invisible that John joined relieved his suffering.
- c. John went to a better place.
- d. [\*ID/LIT] The better place that John went to should make him happy.

(73) *Conjunct movement:*

- a. John and Mary shuffled off this mortal coil.
- b. [\*ID/\*LIT] John shuffled off this mortal coil with Mary.
- c. John and Mary paid the ultimate price.
- d. [\*ID/LIT] John paid the ultimate price with Mary.

(74) *There-insertion:*

- a. John came to a sticky end.
- b. [\*ID/?LIT] There came to a sticky end John.<sup>63</sup>

These idioms are all syntactically immobile, thus confirming my reformulation of Newmeyer's model in the context of Horn's concept of thematic composition. An idiom's  $M_1$  is the source of the thematic structure of an idiom, and when this thematic structure fails to coincide with the thematic structure of the idiom's  $M_2$ , the idiom will be syntactically immobile.

### 2.3.2 Newmeyer's $M_2$ and the Principle of Semantic Inertness

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<sup>63</sup> This may not work partially because of the Definiteness Effect on there-insertion, by which the postverbal subject must usually be indefinite (Levin, 1993:§6.1). However, *\*There came to a sticky end a sailor* doesn't seem any better to me.

What about the second half of Newmeyer's hypothesis? This is the requirement that for an idiom to undergo a transformation, the idiom's  $M_1$  and  $M_2$  must both independently govern that transformation. This can be difficult to tease out for phrasal idioms, as the phonological form of an idiom (i.e., the phonological words involved) and the thematic structure involved in a literal reading of those words are confounded. But let us consider the kind of case where it seems as if the  $M_2$  is prohibiting a transformation that the  $M_1$  allows:

- (75) a. Under intense questioning, Mary spilled the beans.  
       b. [ID/LIT] The beans were spilled under intense questioning.
- (76) a. Under intense questioning, Mary sang like a canary.  
       b. [\*ID/\*LIT] Was sung like a canary under intense questioning.

Note that although the  $M_1$  for both *spill the beans* and *sing like a canary* is something like 'reveal the secret', the idiom *sing like a canary* cannot passivize. Under Newmeyer's hypothesis, the  $M_2$  semantic representation of *sing like a canary* would be what is preventing it from passivizing. *Sing* here has no internal argument to raise to subject position; the passive morpheme, in suppressing the external theta role, would indeed leave it without any argument at all.

However, this may be illusory. *Sing* superficially seems unergative, but can optionally take a cognate object (77a), which can then passivize (77b):

- (77) a. The old man sang a mournful song.  
 b. A mournful song was sung by the old man.

Instead, *sing* is an alternating transitive verb that in the usual case undergoes Unspecified Object Deletion (Levin, 1993:33). If the  $M_2$  of *sing like a canary* was operative here, we would expect that the idiom could take a cognate object, as well:

- (78) a. [\*ID/LIT] Under intense questioning, Mary sang a song like a canary.  
 b. [\*ID/?LIT] A song was sung like a canary by Mary.

Clearly this doesn't work; only a nonidiomatic interpretation is available for (78a-b), one in which Mary is imitating the actual birdsong of a canary.<sup>64</sup> The idiom simply does not allow a cognate object. Note that it cannot be the  $M_1$  that is blocking this possibility, as 'reveal the secret' allows for a direct object (cf. *spill the beans*). Why can *song* here not map to 'secret'? Why is no cognate object possible?<sup>65</sup>

The only conclusion, it seems to me, is that this is neither an unergative nor an alternating transitive structure; the literal reading of *sing* is wholly irrelevant. The reason the idiom cannot passivize is that the phonological form of the idiom is frozen, and so no cognate object—or indeed, any element whatsoever—can intervene between *sing* and *like a canary*. For example, adverbs cannot intervene:

- (79) [\*ID/LIT] Under intense questioning, Mary sang tearfully like a canary.

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<sup>64</sup> Or imitating a canary singing a human song, say Leonard Cohen's "Bird on the Wire."

<sup>65</sup> For more on cognate objects, see Hale & Keyser (2002) and Gallego (2012).

Nor can either *like a canary* or *a canary* be felicitously extracted:

- (80) a. [ $?*ID/LIT$ ] Like a canary, that's how Mary sang.  
 b. [ $*ID/LIT$ ] A canary, that's what Mary sang like.

We can see a similar pattern from lexical idioms in the same contexts. Consider *crack*, which in the context of (81a) also means something like 'reveal the secret'.

However, *crack* cannot passivize (81b):

- (81) a. Under intense questioning, Mary cracked  
 .b.  $*Cracked$  under intense questioning.

If *crack* under a literal reading is unergative, we could argue with Newmeyer that the  $M_2$  is to blame.<sup>66</sup> Although (82a) seems superficially equivalent to (81a), we can see from (82b-c) that *crack* under a literal reading is actually ergative, with both an inchoative (82a) and a causative (82b) form (Levin, 1993:241-42). The causative can indeed appear in the passive (82c):

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<sup>66</sup> One might object that *crack* in the sense used here is not idiomatic, but merely a (synchronic) homonym of ergative *crack*. If so, it is an unergative with no internal argument, and cannot passivize for this reason only. I see no principled basis for deciding between these two possibilities; in fact, this would be more evidence for arguments against drawing a fine line between figurative and literal language.

- (82) a. In the hot sun, the coconut cracked.  
 b. Natalie cracked the coconut with a machete.  
 c. The coconut was cracked by the hot sun / by Natalie.

If the M<sub>2</sub> of *crack* is involved in the flexibility of the idiom, we should see something like the ergative alternations in (82). But *Mary* cannot raise to subject position in a passive context, unlike *the coconut* in (82c); neither can she serve as the internal argument in the causative construction (83), unlike *the coconut* in (82b):

- (83) \*The cops cracked Mary with their intense questioning.<sup>67</sup>

*Mary* is not the internal argument of ergative *crack* in (81a), but rather the external argument of the transitive predicate ‘reveal the secret’. The reason that the idiom cannot passivize is because its phonological form is monomorphemic, and so it cannot occupy discontinuous pieces. *Crack* can appear in place of the continuous constituent ‘reveal the secret’, but not ‘the secret was revealed’, in which (minimally) the passive morpheme *be* intervenes between the two chief components of the predicate. Again, it is not the M<sub>2</sub> semantic representation that is preventing passivization here, but rather the phonological integrity of the idiom.

Let us now reconsider Horn’s (2003:265) account of why *get a bum rap* “[receive] [false blame]” fails to passivize.<sup>68</sup> Horn notes that *get* independently fails to passivize in literal sentences; this would appear to reflect Newmeyer’s requirement that

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<sup>67</sup> Compare “The cops cracked Mary’s head with their nightsticks.”

<sup>68</sup> See §2.2.6 and (47) above.



an idiom's  $M_2$  representation independently govern a given transformation in order for it to be felicitous. However, it's not clear that the idiom includes *get* at all. Out of the first 15 results in a COCA<sup>69</sup> search for *bum rap*, I find that 7 do not involve *get* (indeed, two involve *give*):

- (84) a. this. . . is a **bum rap** for authentic religion  
 b. may have been the victims of a **bum rap**  
 c. that's a **bum rap** of a name  
 d. the dictator had been given a "**bum rap**"  
 e. is that a **bum rap**?  
 f. I've always given cloth diapers a **bum rap**.  
 g. Maybe it was a **bum rap**

If *bum rap* is a lexical idiom, not a phrasal idiom, and if Horn is correct that *get* independently cannot passivize, we can account for *get a bum rap*'s immobility without invoking the idiom's  $M_2$ .

Based on such considerations, and from inconsistent evidence presented by Newmeyer as to the necessity of the  $M_2$  governing a transformation,<sup>70</sup> I conclude that any constraints on syntactic mobility that are not predictable on the basis of an idiom's  $M_1$  are not due to the idiom's  $M_2$ , but rather to the phonological form of the idiom. This claim

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<sup>69</sup> Corpus of Contemporary American English (Davies, 2008-).

<sup>70</sup> See fn. 7 in Newmeyer (1974). Newmeyer notes that in cases where a rule is unformulable for the literal reading of an idiom, " $M_2$  does not block the application of the rule if the conditions for  $M_1$  are met." For example, *turn(s) out* allows Subject Raising (*It turns out that Paul has had a fall* / *Paul turns out to have had a fall*; *ibid.*(10a)), even though *turn out* in its literal sense is non-embedding, and thus cannot govern Subject Raising.

will not be uncontroversial. Arseneault (2014), in a paper titled “How to Criticize Lexical Accounts of Idioms,” labels the first part of this claim the *Thesis of Semantic Inertness*:

(85) *Thesis of Semantic Inertness (TSI): [T]he words of the phrase do not contribute their ordinary literal meaning in idiomatic contexts.*

(Arseneault, *ibid.*:142)

Arseneault is setting up a straw man here, as the rest of her paper is dedicated to attacking this position.<sup>71</sup> Nonetheless, I like the phraseology, and adopt it here as the *Principle of Semantic Inertness*, reformulating it as follows:

(86) *Principle of Semantic Inertness (PSI): Only the intended conceptual structure of a predicate is relevant to the computational and interpretive component of the grammar; other conceptual structures associated with the same phonological forms are semantically inert in the context of language production.*

There are two things to note about my reformulation. The first is that I make no reference to idioms or figurative language. Indeed, I claim that the PSI is applicable to all predicates. For example, when I say that I’m *swimming* in paperwork, the conceptual structure associated with aqueous locomotion is semantically inert; it has no interpretive reflex. Likewise, when I say that I saw three otters frolicking on the *bank* of the Oconee

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<sup>71</sup> I take on some of her arguments against Semantic Inertness in the next section.

River, the conceptual structure associated with the consumer financial institution is inert. The truth conditions of such a sentence are defined specifically with respect to otters and rivers, not savings and loans; the latter concepts are thus semantically inert.

Second, note “the intended conceptual structure” and “in the context of language production.” From a comprehension perspective, an idiom may be ambiguous between the literal and figurative interpretations, and in certain contexts both interpretations are actively in competition.<sup>72</sup> For example, for the sentence *While milking his cows, the farmer kicked the bucket*, either a literal or figurative interpretation is plausible, and the listener may consider both possibilities in the process of comprehension.

In the mind of the speaker, however, no such ambiguity exists; one does not choose to utter *give up the ghost* without first deciding whether one is talking about dying gradually or about aiding and abetting supernatural fugitives. Given this lack of intentional ambiguity in an idiomatic (or literal) context, we would not expect interference from the literal (or idiomatic) interpretation with respect to the syntax of sentence generation.

In this section, we have seen evidence that the second half of Newmeyer’s (1974) hypothesis, the requirement that the  $M_2$  of an idiom independently govern any transformation that the idiom undergoes, is wholly unnecessary; the  $M_1$  of the idiom is sufficient to derive its syntactic mobility. I have then made the larger claim that the  $M_2$  of an idiom is semantically inert in the context of sentence generation, a claim that I formalize as the Principle of Semantic Inertness. In the next section, I consider some purported exceptions to this claim.

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<sup>72</sup> See e.g. Briner & Virtue (2014) and references therein.

## 2.4 Metalinguistic extensions of idioms

Egan (2008) and Arseneault (2014:151-53) discuss *figurative extensions*, in which idioms are forcibly interpreted in terms of their M<sub>2</sub>. Consider the example Arseneault cites from Charles Dickens' *The Old Curiosity Shop* (in allusion to the idiom *cream of the crop*):

“‘How’s the cream of the clerkship, eh?’ ‘Why, rather sour, sir,’ replied Mr Swiveller. ‘Beginning to border upon cheesiness, in fact.’” Likewise, Egan (ibid.:393) constructs the following hypothetical exchange:

(87) Paulie: I hear Mr. Jones kicked the bucket.

Vito: Yeah. He almost connected yesterday; today he really put the boot on it.

Arseneault argues that “these variants tell against the Thesis of Semantic Inertness because these extensions and modifications require. . . that those parts contribute their ordinary meaning.” Given the possibility that these sorts of extensions are nothing more than wordplay, deriving such a conclusion about the organization of the grammar based on these forms seems unwarranted. If we are to admit all uses of language in the fictional works of Dickens into the grammar, then why not the nonstandard forms in the works of Nobel Laureate Bob Dylan?

(88) a. It ain’t no use in turnin’ on your light, babe

That light I never **knowed**

(from “Don’t Think Twice, It’s Alright,” 1963)

b. You must pick one or the other

Though neither of them **are to be what they claim**

(from “Just Like Tom Thumb’s Blues,” 1965)<sup>73</sup>

The same holds for works of the poet e. e. cummings (I refrain from boldfacing the aberrant syntax here):

(89) anyone lived in a pretty how town

(with up so floating many bells down)

spring summer autumn winter

he sang his didn’t he danced his did.

(from “anyone lived in a pretty how town,” 1940)

Clearly, these forms are creative extensions of language, motivated neither by the unconscious machinery of the grammar nor by normal communicative intent. The existence of a single use of an isolated form by a single speaker is not sufficient evidence of its being part of the language; it must rather be used systematically before we are justified in restructuring our assumptions. If I say to someone on the bus tomorrow, “Chased the mailman the dog!” or “Verb-final this sentence is!” her conclusion should not be that I happen to speak a VOS or OSV dialect of English. Similarly, Jackendoff (2002:158-59) notes in a discussion of denominal verbs that while one might normally

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<sup>73</sup> Anyone familiar with Dylan’s oeuvre will know this is only scratching the surface.

say *butter the bread*, one might also humorously utter *mustard the sandwich* “as a metalinguistic joke; speakers know that these forms do not exist.”<sup>74</sup>

Schenck (1995:257-58), too, argues that “the ability of people to play with words is outside the scope of a theory of idioms proper,” and points out that speakers are capable of using language to speak *about* language. To illustrate this, Schenck notes that certain variants of idioms, such as the French idiom *avoir un chat dans la gorge* (‘have difficulty speaking’; literally, *to have a cat in the throat*), are acceptable only in the context of echo questions. Boisset (1978:55-56) had noted that, although this idiom does not undergo clefting under normal circumstances, when there is contrastive stress, it is significantly more acceptable:

(90) a. *Paul a un chat dans la gorge.*

Paul has a cat in the throat

‘Paul is having difficulty speaking’

b. *\*C’est un chat que Paul a dans la gorge.*

It is a cat that Paul has in the throat

c. *C’est pas un cheveu, c’est un chat que Paul a dans la gorge.*

It is not a hair it is a cat that Paul has in the throat

(Schenck, 1995(7-9))

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<sup>74</sup> Such a form may of course regularize in the language over time, at which point its usage would no longer be metalinguistic. One can also imagine a non-metalinguistic usage in a jargonistic context (e.g. in a sandwich shop), which does not extend much beyond the speech community involved.

Yet the form in (90c) is not an out-of-the-blue use of the idiom, but rather a clarification that an idiom is intended. For example, if speaker A utters (90a) but speaker B fails to hear it correctly, thinking they might have heard *un cheveu*, they might respond with *Est-ce que Paul a un cheveu dans la gorge?* ('Paul has a hair in his throat?'). In such a case, (90c) would be an appropriate response. Schenck points out that this is an instance of metalanguage, whereby speaker A is merely *referring* to an element of the object language, i.e., referring to the idiom in question.

As for the figurative extensions cited by Egan and Arseneault at the beginning of this section, I think it's clear that what is happening is a kind of self-conscious exploitation of elements of the object language for the sake of humor. The distinction between metalanguage and object language can be seen in the following pair of sentences:

- (91)   a. January has thirty-one days.  
           b. January has seven letters.

Note that (91a) is a statement about the month of January, whereas (91b) is a statement about the word *January*. Two different sorts of propositions are being expressed, and indeed we would normally indicate this by putting quotes around the word when its status as a word is what's being referred to. Using this convention, we can see that the following statements are (under a careful reading) in fact true:

- (92) a. “January” does not have thirty-one days, but January does.  
 b. January does not have seven letters, but “January” does.

The word *January* does not and cannot “have days,” and the month of January does not and cannot “have letters.” The issue here is with self-reference and a confusion of object language and metalanguage, as in the Liar’s Paradox, which has many formulations but can be boiled down to a single sentence (Beall, Glanzberg, & Ripley, 2017):

- (93) This sentence is false.<sup>75</sup>

In the figurative extensions cited by Egan and Arseneault, we see a similar metalinguistic reference to the object language, in which an idiom is self-consciously being referenced. Along similar lines, Svenonius (2005:228) notes that metaphorical references to idioms are possible, such that the idiom *beard the lion in his den* (‘confront an adversary on his own territory’) can be used as the basis for the references in (94b-c):

- (94) a. I’ll beard the lion in his den.  
 b. I’ll beard the lion in his office.

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<sup>75</sup> See Hofstadter (1999 [1979]) for the larger philosophical context, and discussion of sentences such as (93). Such paradoxes have played an important role in modern theorizing about formal systems. Although they have ancient roots, the modern impact comes from Bertrand Russell’s noticing in 1902 that the system developed in Gottlob Frege’s *Basic Laws of Arithmetic* (2016 [1903]) allowed for a set *R* whose extension is all and only sets that are not members of themselves. Russell’s paradox is that if *R* is a member of itself, then it is not a member of itself, as it then does not belong to the set of sets that are not members of themselves; if *R* is not a member of itself, then it does belong to the set and is therefore a member of itself (Guttenplan, 1997).



c. I'll interview the lion in his den.

(Svenonius, *ibid.*(1a-c))

The examples in (94b-c) “allude to an idiom without actually containing one” (*ibid.*:228).<sup>76</sup> The very same issue seems to be the source of the confusion with respect to whether the M<sub>2</sub> of an idiom normally has any interpretive value. In (95) *spill the beans* is used to refer to revealing a secret, whereas the succeeding context is referring not merely to the revealing of this secret, but also to the words *spill the beans*.

(95) Mary spilled the beans quite suddenly; in fact, she upended the pot and dumped them on the kitchen table.

This additional reference is metalinguistic in nature, and thus is a poor argument against the Principle of Semantic Inertness. In the normal, non-self-referential use of idioms, the semantic value of an idiom's M<sub>2</sub> plays no role in either structure or interpretation.

*Kicking the bucket*,<sup>77</sup> in the end, has nothing to do with buckets.

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<sup>76</sup> Svenonius also notes that idioms in control structures (*Every lion prefers to be bearded in his den*) are likewise metaphorical references to the idiom involved. (Schenck (1995:257) makes a similar point with respect to *The piper wants to be paid*.) Presumably this would not apply to an idiom in a raising context (*Every lion seems to be bearded in his den*), although such examples have always seemed like figurative extensions to me as well.

<sup>77</sup> My nominalization of *kick the bucket* here is, in fact, metalinguistic, and would be unacceptable in the object language: \**John's kicking the bucket surprised me*. See also fn. 80 below.

## 2.5 Conclusion

In this chapter, I've shown that the heterogeneity associated with phrasal idiom mobility and interpretation is effectively accounted for in terms of the idiom's  $M_1$  meaning. The syntactic mobility associated with an idiom is precisely the same as that of the idiom's  $M_1$ ; this is because it bears the same thematic structure as its  $M_1$ , assigning the same theta roles. In order to observe this correspondence, however, it is necessary to *precisely* identify the components of meaning of an idiom; a mere intuitive paraphrase does not suffice.<sup>78</sup> Only in doing so can we predict whether an idiom's  $M_1$  allows the displacement of its surface components.

The advantages of this account with respect to the learnability question should be apparent. If the semantic representation of an idiom is directly predictive of its syntactic mobility, then idioms do not have to be idiosyncratically marked, whether for specific transformations they cannot undergo (as in Weinreich, 1969), for which of their components are or are not idiomatic / nonextractable (as in Katz, 1973), or for which level of the frozenness hierarchy they belong to (as in Fraser, 1970). The semantic representation of an idiom must be available in the input in any case, in order for the child to learn what the idiom means in the first place.

In addition to laying out how an idiom's  $M_1$  predicts the idiom's behaviour, I've also demonstrated that the  $M_2$  of an idiom, i.e., the interpretation associated with a literal

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<sup>78</sup> It should also again be underlined that idiolectal variation in an idiom's  $M_1$  seems to be par for the course.

reading of its phonological form, plays no role in the context of sentence generation. I refer to this as the Principle of Semantic Inertness,<sup>79</sup> and repeat it here:

- (96) *Principle of Semantic Inertness (PSI): Only the intended conceptual structure of a predicate is relevant to the computational and interpretive component of the grammar; other conceptual structures associated with the same phonological forms are semantically inert in the context of language production.*

I hold (96) to be universally true, not just applicable to idioms. In the domain of language comprehension, a given phonological form may be associated with more than one conceptual structure (e.g., in polysemous words such as *calf*). In the mind of the *speaker*, however, only the intended conceptual structure is active; other conceptual structures are inert. Given this lack of intentional ambiguity in (e.g.) an idiomatic context, we would not expect interference from the literal interpretation with respect to the syntax of sentence generation. In essence, (96) predicts that only an idiom's  $M_1$  is relevant in language production, and that the idiom's  $M_2$  is entirely inert.

But how, precisely, does the  $M_1$  of an idiom constrain its syntactic behaviour in the context of the derivation of a sentence containing it? For this, we need a theory of idiom insertion, and one that ideally is continuous with simplex lexical insertion. This will be the subject of Chapter 4. For now I will just note that when the conceptual

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<sup>79</sup> As noted in the main body of the text, I adopt the term *semantic inertness* from Arseneault (2014), who introduces it in order to demonstrate that it is not true. The formulation here is quite different from hers, but should have the same effect (with respect to idioms, that is).

components of idioms are considered apart from their phonological reflexes, they don't look quite as odd. They are used to express the same propositions as in "literal" language, and are instantiated by the same abstract structures. Attempting to account for the behaviour of idioms sometimes seems akin to herding cats, but a careful consideration of their semantics makes those cats a bit more quiescent, and thus a bit easier to herd.<sup>80</sup>

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<sup>80</sup> This would be another metalinguistic extension of the idiom *herding cats*. Note also that as *herding cats* is an idiom, and in this extension the interpretive reflex of *cats* is 'idioms', if Doug is *herding cats*, then he is also *herding 'herding cats'*, and thus *herding 'herding 'herding cats''*, and so on. This interpretive hall of mirrors is precisely why metalanguage and object language must not be confused.

## **CHAPTER 3: THE ASPECTUAL PROPERTIES OF PHRASAL IDIOMS**

### *3.1 Overview*

In this chapter, I look at the aspectual properties of phrasal idioms, focusing on the question of whether aspect is compositionally derived from an idiom's semantic representation under a figurative interpretation, or from the semantic representation associated with the meanings of an idiom's components under a literal reading; as I discussed in Chapter 2, these two semantic representations are referred to by Newmeyer (1974) as an idiom's  $M_1$  and  $M_2$ , respectively. The question of aspectual compositionality in idioms with respect to the normal readings of an idiom's components has been debated in the literature, with some (Marantz, 1997; McGinnis, 2002, 2005; Mateu & Espinal, 2007; Leivada, 2017)) arguing for full compositionality, and others for compositionality with respect to idioms' meanings only (Glasbey, 2003, 2007). Working within a privative features model (Olsen, 1997), I argue here for the latter position, presenting evidence that the aspectual properties of idioms are predictable on the basis of their meanings and therefore derived from their  $M_1$  semantic representations, and that the  $M_2$  literal readings of their components are irrelevant to aspectual composition. I further argue that some phrasal idioms are more highly specified with respect to aspect than their commonly paraphrased meanings, concluding that they may lexicalize a larger structure than verbs, including an inner aspect head.

In §3.1, I briefly introduce the debate over aspectual compositionality in idioms by highlighting the chief points made by McGinnis (2002, 2005) and Glasbey (2003, 2007), and discuss the question of whether aspectual composition is a monotonic function which retains the semantic representations of verbs under composition, or a nonmonotonic process by which some elements supplant the inherent aspectual properties of verbs. In §3.2, I contrast a number of models of lexical/inner aspect, including those of Vendler (1967), Comrie (1976), Verkuyl (1972), Smith (1991), and finally the privative features model of Olsen (1997), which produces monotonic composition by allowing verbs to be either underspecified for aspectual features or positively marked for those features. In §3.3, I review some of the tests for the features associated with telicity and durativity proposed by Vendler (1967), Dowty (1979, 1986), Olsen (1997), MacDonald (2008a,b), and others, and discuss how to incorporate these tests into Olsen's monotonic system.

I then turn to the main concerns of this chapter in §3.4-5, where I consider competing arguments about the compositionality of aspect in phrasal idioms, including those of Marantz (1997) and McGinnis (2002, 2005) on the one side, and Glasbey (2003, 2007) on the other, as well as efforts to reconcile Glasbey's observations with McGinnis's theoretical claims (Mateu & Espinal, 2007; Leivada, 2017). I then extend the feature tests to a number of other idioms, to fully elaborated paraphrases of their  $M_1$  figurative meanings, and to the  $M_2$  literal readings of their components. In doing so, I demonstrate that all the idioms considered have the same aspectual properties as the paraphrases of their  $M_1$  meanings, which in all cases differ from those of their phonological components under a literal reading; I therefore conclude that an idiom's  $M_2$

is in fact semantically inert in the domain of aspectual composition, and that an idiom's  $M_1$  is sufficient to derive its aspectual properties.

Finally, in §3.6, I consider how to incorporate idioms into Olsen's privative features model, arguing that although verbs cannot be lexically specified as (e.g.) nondurative or atelic, phrasal idioms *can* be, precisely because they may lexicalize a larger piece of structure. I propose that the lexical representations of idioms may therefore include an inner aspect projection in addition to a verbal projection (with AspP dominating VP and dominated by vP, as in MacDonald, 2008b). I briefly speculate on the nature of the inner aspect head ( $Asp^0$ ), and conclude.

### 3.1.1 Aspectual (non)compositionality in idioms: The problem at hand

McGinnis (2002:669) argues that aspect in phrasal idioms is systematic and wholly compositional, asserting that “for any idiomatic VP with a verb  $V_n$ , there will be a nonidiomatic VP with  $V_n$  that has the same aspectual properties”;<sup>81</sup> in other words, the aspectual properties of a phrasal idiom are constrained by the aspectual class of the verb involved. Appealing to Rappaport Hovav and Levin's (1998:106-7) distinction between the *structural* and *idiosyncratic* components of meaning, she further claims that “even if a VP has a noncompositional idiosyncratic meaning, it will have a compositional structural meaning. Specifically, it will have the same aspectual properties as any VP with the same syntactic properties” (McGinnis, 2002:668). An idiomatic reading of a VP in which an

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<sup>81</sup> The reason McGinnis does not phrase this as a one-to-one relationship is because verbs such as *get* are ambiguous with respect to agentivity. This gives rise to an agentive Accomplishment in a sentence like *The mouse stopped getting the cheese* and a nonagentive Achievement in an idiomatic predicate like *The cat got Harry's tongue* (ibid:669-70).

idiom such as *kick the bucket* appears, then, will compose with other elements to yield the same aspectual properties as in a literal reading of the same VP, as both have the same verb:

- (97) a. [ID] John kicked the bucket.  
b. [LIT] John kicked the bucket.

Therefore, sentences such as (97a-b) should have identical aspectual properties.

Glasbey (2003), however, notes that some idioms seem to belong to a different aspectual class than that of their literal readings, citing the idiom *paint the town red* as an example. In (98a), we see that the idiom is acceptable with a *for [time]* adverbial, which is anomalous in a literal reading (98b) of the same sentence. This suggests that the two readings differ with respect to *telicity*, or whether they involve a natural endpoint:

- (98) a. [ID] Mary and her friends painted the town red (for a few hours / #in a few hours).  
b. [LIT] Mary and her friends painted the town red (\*for a few hours / in a few hours). (Adapted from Glasbey, 2003(1,1a,1b,3))

In response to Glasbey (2003), McGinnis (2005) argues that the interpretation of the idiom in (98b) as *atelic* (without a natural endpoint) is merely a pragmatic implicature, proposing (99) as acceptable:



- (99) [ID] Okotoks?<sup>82</sup> Why, we painted that cute little town red in about an hour. (McGinnis, 2005:10)

McGinnis is correct in this, as a contextually supplied endpoint can shift an atelic predicate towards a telic interpretation. For example, the verb *bike* is normally atelic, but in a context such as *Keiko biked, but Miles drove to the party*, the context forces a telic interpretation, in which the activity of biking has an understood endpoint.

However, McGinnis' argument that the telic phrase *paint X red* can likewise be shifted to an atelic, as in (100), is perhaps less convincing:

- (100) We painted the set red for a couple of hours, but then the director realized it looked boring. (McGinnis, 2005:9).

McGinnis finds (100) acceptable, but I agree with Glasbey and her informants (2007:3) that it is "quite odd and difficult to interpret."<sup>83</sup>

The picture, then, remains muddled. This is partially due, I think, to confusion over the nature of aspectual composition in general; in particular, whether it is *monotonic*, that is, whether the semantics of a verb are preserved under composition (with the meaning of additional elements being additive), or *nonmonotonic*, with the semantics of a verb susceptible to suppletion<sup>84</sup> (what is sometimes called *aspectual coercion* or *shift*). Aspect is an oddity when it comes to semantic compositionality

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<sup>82</sup> A town of about 30,000 on the Sheep River in southern Alberta.

<sup>83</sup> I have confirmed this judgement with several informants myself.

<sup>84</sup> I use this term in a generic sense (i.e., not in its familiar sense in the domain of morphology) to mean that part of the semantics of the verb is replaced upon composition with other elements.

generally,<sup>85</sup> which is widely held to conform to the *Principle of Compositionality*: the meaning of a complex expression is composed of the meanings of its individual parts and the mode of their composition, with the meanings of all the individual elements contributing to the interpretation as a whole.<sup>86</sup> Most models of aspectual composition, however, depend on supplanting some aspects of the inherent meaning of a predicate in the process of composition, with the result that the Principle of Compositionality is violated.

In this dissertation, I adopt the monotonic analysis of Olsen (1997), a privative features model which I describe in §3.2.5, wherein *telicity*, *durativity*, and *dynamicity* are part of the inherent semantics of a verb and hence uncancellable, but *atelicity*, *nondurativity*, and *nondynamicity* are pragmatic implicatures cancellable in the right environments. The appeal of this model (beyond its empirical coverage) is that it makes precise predictions about which components of aspect are semantic, and which are pragmatic. However, Olsen's model will require some modification to account for idioms, which unlike individual verbal heads, appear in some cases to be semantically specified as atelic and/or nondurative; I consider this complication in §3.6 below.

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<sup>85</sup> As are idioms, which is part of what makes aspect in idioms such an interesting but challenging topic to explore.

<sup>86</sup> A standard view is that of Partee (1995:313). "We need to account for a language user's ability to understand novel sentences, of which there are a potential infinity. . . this fundamental aspect of semantic competence provides an argument that [sentences] must be governed by some version of the Principle of Compositionality, or Frege's Principle." Although usually attributed to Gottlob Frege, it is apparently not stated explicitly anywhere in his works (Pelletier, 2001); the first to attribute it to him may have been Carnap (1947).

### 3.2 Models of lexical/inner aspect

Like *tense*, *aspect* is concerned with the temporal properties of an expression, and indeed the two are sometimes conflated, both in a language's morphology and in the work of researchers and educators classifying or referring to that morphology. Thus in the Romance languages, the Imperfect (e.g., Spanish *cocinaba*, 'he was cooking') is sometimes referred to as a tense,<sup>87</sup> whereas it also has aspectual properties, referring to ongoing or habitual events. Comrie (1976) makes the distinction as follows: tense is concerned with "situation-external time," and "relates the time of the situation referred to to some other time, usually to the moment of speaking," whereas aspect is concerned with "situation-internal time," referring to "the internal temporal constituency of a situation" and the range of ways to view it (ibid.:2-3). Tense is a *deictic* category, locating situations on an absolute timeline relative to a reference time (which in the simple case is the same as the utterance time). Aspect is *non-deictic*, not locating situations with respect to an external timeline, but rather describing the "internal temporal structure of the situation" (Smith, 1991:135), e.g., whether the situation is presented as ongoing at the reference time (as in the English progressive/imperfective<sup>88</sup>) or completed (as in the perfective).

I will assume here a tripartite distinction with respect to aspect. The major division is between *outer* and *inner aspect*. Outer aspect, also known as *grammatical*, *sentential*, or *viewpoint* aspect, refers to aspectual properties which find their expression outside of vP/VP (Travis, 2010); this would include, for example, the imperfective/

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<sup>87</sup> For example, from the website StudySpanish.com: "The *imperfect tense* is used to refer to actions in the past that occurred repeatedly."

<sup>88</sup> Olsen (1997:§2.1) makes a distinction between *progressive* and *imperfective*, with the former a subtype of the latter.

perfective distinction mentioned above. Inner aspect, frequently referred to as *lexical*, *inherent*, or *situation aspect*, or as *Aktionsart*, concerns the internal aspectual nature of a predicate, and forms the input to the computation of outer aspect.

However, as Leivada (2017) notes, one can also distinguish two components of inner aspect. Verbs have inherent aspectual properties that can be modified in the course of aspectual composition with other elements inside the predicate; therefore *bike* and *bike to the library* differ aspectually, as in (101a-b):

- (101) a. Keiko biked.  
b. Keiko biked to the library.

In (101a), we have an atelic predicate, without any natural endpoint; in (101b), we have a telic predicate instead.

In what follows, I will refer to the aspectual properties inherent to a verb as *lexical* or *inherent aspect*, reserving the term *inner aspect* for the aspectual properties of the predicate as a whole. In describing the work of authors who do not make this distinction, I will use the compound term *lexical/inner aspect*.

### 3.2.1 Vendler's categorical model

Although the aspectual properties of different predicates were described as early as Aristotle, and had been discussed in the philosophical literature for some time (Ryle, 1949; Kenny, 1963), Vendler (1967:Chap. 4) has been the most influential work on

lexical/inner aspect in recent decades, and is probably the most widely cited by linguists. In that volume, Vendler distinguished between four kinds of “time schemata” inherent to verbs (and/or predicates).

Vendler’s first category, *Activities*, includes verbs like *run* and *drive*; these have a duration but no *telos*, that is, no natural endpoint or culmination. *Accomplishments*, on the other hand, include complex predicates like *read a book* and *build a house*; these necessarily have both duration and a natural endpoint. *Achievements* include verbs like *recognize* and *notice*; these have no duration, but like Accomplishments, have a natural endpoint. Vendler’s fourth class, *States* such as *know* and *love*, are nondynamic in that they don’t involve a change of state; States have a duration, but lack a natural endpoint. Finally, to this four-part taxonomy, Comrie (1976) added a fifth category, *Semelfactives*, which include verbs like *cough* and *kick*. Like Achievements, Semelfactives are punctual, but unlike Achievements, they have no natural endpoint or culmination. Semelfactives standardly refer to “a situation that takes place once and once only” (ibid.:42), but can be read iteratively in the progressive, as in *He was coughing*.<sup>89</sup> These five basic classes have remained central to most authors’ accounts.

As to the question of whether these classes are inherent to verbs or to predicates, Vendler is imprecise on this point:

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<sup>89</sup> Comrie (ibid.:43) notes that some languages show evidence of morphology that allows only punctual interpretations of a verb, pointing out that Hungarian has both *zörren* ‘knock, give a knock’ and *zörög* ‘knock [possibly repeatedly]’, and that similar phenomena are apparent in Russian.

Thus we have arrived at the time schemata of two important species of verb. Let us call the first type, that of *running, pushing a cart*, and so forth, ‘activity terms’, and the second type, that of *running a mile, drawing a circle*, and so forth, ‘accomplishment terms’ (Vendler, 1967:102).

The class of Accomplishments seems to include only complex predicates; this may be because they are always syntactically derived.<sup>90</sup> Indeed, where a lexical Accomplishment is claimed in the literature, the examples given are invariably complex predicates.<sup>91</sup> For example, Pustejovsky (1991:49) claims that *build* and *destroy* are lexical Accomplishments; however, he illustrates with the complex predicates *Mary built a house* and *Mary destroyed the table*. At the very least, it seems that Accomplishment verbs are obligatorily transitive (compare *\*Mary built/\*Mary destroyed*); as these verbs by definition cannot occur without internal arguments, the standard tests cannot be applied to these verbs in isolation. I examine these tests in greater detail in §3.3.

### 3.2.2 Aspectual shift and Comrie’s oppositional model

The beginnings of a feature-based model can be seen in Comrie (1976), where Vendler’s classes are decomposed into three binary oppositions: “punctual and durative,” “telic and atelic,” and “state[s] and dynamic situations.” Comrie considers these to be inherent

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<sup>90</sup> This is the position taken by MacDonald (2008b). Nonetheless, we will see in §3.4.4 that some phrasal idioms behave as Accomplishments; I will argue this is possible because they lexicalize a greater degree of structure than do verbs.

<sup>91</sup> However, Smith (1991:72) offers *arise* as a lexical Accomplishment, as in *Susan arose* (16a), but I think this is really an Achievement (*?Susan arose for several minutes*).

semantic properties of verbs, limiting the other elements with which predicates can combine in a sentence and/or “severely restricting their meaning” (ibid.:41). An example of such a limitation is that although punctual verbs such as *arrive* (in Vendler’s terms, an Achievement) can freely combine with punctual adverbials such as *at midnight* (102a), this is impossible with predicates like *build a house* and *be Japanese*:

- (102) a. The dark stranger arrived at midnight. (Achievement)  
       b. \*The old man built a house at half past three. (Accomplishment)  
       c. \*The young lady was Japanese at noon. (State)

The predicates in (102b-c) are both durative, and are thus incompatible with punctual modifiers like *at noon*.

Although for Comrie aspect is a lexical property, he notes also that this inherent aspect can be modified through what has since become known as *aspectual shift*,<sup>92</sup> a compositional process involving other sentential elements (as well as contextually-derived information). For example, he notes that adding a direct object to an optionally transitive verb can shift it from atelic to telic; whereas (103a) “describes an atelic situation,” (103b) refers instead to a telic situation, with a “well-defined terminal point”:

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<sup>92</sup> Comrie discusses this phenomenon but does not propose a term for it. Bach (1986) refers to it as *type-shifting*; others refer to it as *aspectual coercion* or more generally *event composition* (though Pustejovsky (1991) considers the former to be a subtype of the latter, occurring with, e.g., the progressive). Smith (1991) argues for a distinction between *shifted* and *derived situation types*; see §3.2.4 below.

- (103) a. John is singing.  
       b. John is singing a song. (Comrie, 1976:45)

A similar process is apparent in (104a-b), where the addition of the Goal PP *to the library* transforms the atelic Activity predicate *bike* into a telic Accomplishment:

- (104) a. Keiko biked.  
       b. Keiko biked to the library.  
       c. #Keiko biked in an hour.<sup>93</sup>  
       d. Keiko biked to the library in an hour.

The Activity in (104a) cannot felicitously co-occur with the frame adverbial<sup>94</sup> *in an hour*, which is why (104c) is anomalous. However, once a Goal is added and it has been shifted to an Accomplishment (104b), it can freely combine with *in an hour* (103d).

Aspectual shift can apply to the punctual-durative opposition, as well; *die* in (105a) is a punctual Achievement, but the addition of the progressive in (105b) shifts it to a durative Accomplishment:

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<sup>93</sup> I use *anomalous* and # here to indicate that a sentence under a normal reading is infelicitous, but that there may exist a borderline, fantastical, or highly context-dependent reading under which it might be acceptable. E.g., (104c) can be read as ‘Keiko biked [her usual ten-mile-distance] in an hour’.

<sup>94</sup> I take this term from Pustejovsky (1991:49-50); Smith (1991:155) refers to these as *completive adverbials* and phrases like *at noon* as *locating adverbials*, the latter of which Smith notes are (confusingly) referred to as *frame adverbials* by Bennett & Partee (1972).



- (105) a. John died.  
       b. John was dying.  
       c. John was dying for hours.  
       d. \*John died for hours.

The durative predicate in (105b) is now compatible with the durative modifier *for hours* as in (105c).<sup>95</sup> In (105d), on the other hand, we can see that the nondurative Achievement *die* cannot co-occur with *for hours* without first being shifted.

### 3.2.3 Verkuyl's nonlexical compositional model

Given the evidence that the aspectual properties of a predicate are not determined solely by the verb, one might hypothesize that aspect is a purely derived property, and not a lexical feature of verbs at all. One example of such an approach is that of Verkuyl (1972), where lexical/inner aspect is treated as a composite feature that holds at the level of the verb phrase. The VP then subcategorizes for certain *nonaspectual* properties of the verb and its complement; for example, a durative VP subcategorizes for an agentive V and an indefinite plural NP, but a nondurative VP does not. The phrase structure rules<sup>96</sup> in (106a-

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<sup>95</sup> As to why the progressive can shift an Achievement but an adverbial cannot, this might be related to the fact that the former heads a functional projection that selects for vP/VP (in most theories), but the latter does not.

<sup>96</sup> The phrase structure rules here are from Dowty's (1979) perspicacious treatment of Verkuyl (1972). Dowty's paraphrase is much more easily summarized than the original, as Verkuyl's presentation and terminology are rather obscure, using the formal mechanism of *polycategorical lexical attachment* (Gruber, 1967). However, it should be noted that Verkuyl (2005) objects to Dowty's characterization in places, writing that the latter misunderstands the feature Verkuyl calls [+/-SQA] (for *Specified Quantity of A*) as (in/)definiteness; Verkuyl clarifies that it instead

b) thus generate the sentences in (107a-b), where a durative VP combines with a durative modifier (107a), and a nondurative VP combines with a punctual modifier (107b). The absence in the grammar of the rule indicated in (106c), however, has the consequence that (107c) is ungrammatical:

- (106) a.  $VP_{\text{Durative}} \rightarrow [V \text{ AGENTIVE}] + [NP \text{ INDEF. PL.}]$   
 b.  $VP_{\text{Nondurative}} \rightarrow [V \text{ AGENTIVE}] + [NP \text{ INDEF. SG.}]$   
 c.  $*VP_{\text{Nondurative}} \rightarrow [V \text{ AGENTIVE}] + [NP \text{ INDEF. PL.}]$

(Adapted from Verkuyl (ibid.:54) and Dowty (1979(60,63,64)))

- (107) a. Hank ate bagels for hours.  
 b. Hank ate a bagel at 3 o'clock.  
 c. \*Hank ate a bagel for hours.

This last sentence is infelicitous because *for hours* is a durative modifier; it cannot co-occur with the nondurative VP *ate a bagel*.

Although Verkuyl was correct to point out that the composition of aspect involves more than just verbal elements, most other researchers consider the verb to have at least some aspectual properties that are inherent, although in some models, these properties have internal structure to them.<sup>97</sup> At any rate, Verkuyl's model can be rather

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“pertains to something discernible that can be separated from other things” (ibid.:21). E.g., although *a piece of music* is indefinite, Verkuyl treats it as [+SQA], whereas *that sort of music* is definite but [-SQA].

<sup>97</sup> Dowty (1979), for example, argues for an aspectual “calculus” based on a generative-semantics-style lexical decomposition; Pustejovsky (1991) actually argues against “features” *per*

straightforwardly refuted by considering simple sentences involving intransitive verbs, where the verb shows aspectual properties despite no aspectual composition being apparent.<sup>98</sup> For example, although the telic predicate in (108a) accepts the frame adverbial *in an hour*, the simple sentence in (108b) does not, as can be seen from (108c):

- (108) a. Mary ran to the store in an hour.  
       b. Mary ran.  
       c. #Mary ran in an hour.       (adapted from Pustejovsky, 1991(25,26))

The infelicity of (108c) can only be due to *run* being inherently atelic; the atelicity here cannot be a compositionally determined feature in Verkuyl's sense, as the verb is alone in the verb phrase.<sup>99</sup>

Instead, as Pustejovsky (1991) notes, atelics do not accept frame adverbials like *in an hour* because the latter "require[] *two* events to be present for a proper modification. . . [e.g.] the two subevents of *build*, *e*<sub>1</sub> and *e*<sub>2</sub>" (ibid.:62). This is possible only for a predicate that entails an inherent endpoint, such as a telic Accomplishment like *build a chair* or *run to the store*. Similarly, Achievements, which are inherently telic, can occur

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*se* and instead for a layered lexical semantics, where event structure (the locus of aspectual distinctions) is just one component. For both, though, I think it's fair to say that lexical aspect is an inherent property of verbs, however formalized.

<sup>98</sup> It should be noted that Verkuyl (1972:§2.2) anticipates this argument, writing that "strictly transitive Verbs never occur alone. . . consequently the inference that certain properties of intransitive Verbs are the same as certain properties of transitive Verbs is rather arbitrary" (ibid.:47). For Verkuyl, *transitive* and *intransitive* are derivative categories, not classes of verbs.

<sup>99</sup> For Olsen (1997), the atelicity of *run* in sentences like (108b-c) is not a matter of its inherent semantics, but is rather a pragmatic implicature arising from *run* being unspecified for telicity. Thus the infelicity in (108c) is cancellable if we indicate a Goal, as in (108a). See §3.2.5 below.

with frame adverbials as in (109b) (although the interpretation here is inceptive, not culminative), but not with durative adverbials (109c):

- (109) a. John will arrive.  
       b. John will arrive in an hour.  
       c. \*John will arrive for hours.

Note that in (109a), the verb *arrive* is alone in the verb phrase; its telicity therefore cannot be a derived property resulting from the composition of the verb with other elements, but must be part of the inherent semantics of the verb. This should be clear from (109c), where the telic predicate cannot combine with the atelic modifier *for hours*.<sup>100</sup> Telicity is therefore an inherent lexical property of *arrive*.

### 3.2.4 Smith's equipollent features model

Although there is good reason to believe that aspect is an inherent property of verbs, we have seen that it is frequently the case that the aspectual properties of the sentence are not identical with the aspectual properties of the verb considered in isolation. To account for how aspectual shift can (and cannot) change the aspectual class of the verb, we therefore need a model of how the inherent semantic features of the verb interact with other elements in the process of composition. Smith (1991) proposes such a model, arguing

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<sup>100</sup> An extremely marginal iterative reading of (109c) may be available, where John is repeatedly arriving; this is a derived event in the sense of Smith (1991), as described in the following section, one wherein the telicity of the individual events remains intact.

that Vendler's classes can be precisely defined by a cluster of three "conceptual temporal properties." Smith refers to these properties as *situation aspect*, and to the classes of verbs that result as *situation types*. The properties are represented by semantic features, which are essentially the same as Comrie's three oppositions: [+/-Stative], [+/-Telic], and [+/-Duration]. The positive and negatively marked features are *equipollent* in that they carry equal semantic weight; they can combine with other elements to form what Smith refers to as *basic-level verb constellations*, consisting of "maximally simple verbs and their associated arguments" (ibid.:71).

Smith characterizes the features as follows: the [+/-Stage] feature divides verbs broadly into *states* and *events*; states consist of "a period of undifferentiated moments, without endpoints," whereas events are dynamic, consisting of *stages* rather than undifferentiated moments.<sup>101</sup> The [+/-Telic] feature applies to events only, dividing them into atelic and telic; atelic events are "processes[] which are realized as soon as they begin," whereas telic events are directed towards a goal or result state. Thus atelic events have an *arbitrary* final point, one which is not entailed by their semantics. Finally, the [+/-Duration] feature divides verbs (including both events and states) into durative and instantaneous situation types.<sup>102</sup> The features Smith assigns to the five Vendler-Comrie classes are in Table 2:

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<sup>101</sup> Smith characterizes *states* with the feature [+Stative/Static] and *events* with [+Stage]. Both terms refer inversely to the same feature: -Stage = +Stative, +Stage = -Stative.

<sup>102</sup> Smith notes that "instantaneous" is an idealization, as events the language treats as instantaneous may actually involve some duration (ibid.:28-29). Comrie (1976:42-43) makes this observation as well.

*Table 2: Features of the situation types in Smith (1991:28-33)*

	Telic	Durative	Stage
Accomplishment	+	+	+
Achievement	+	-	+
Activity	-	+	+
Semelfactive	-	-	+
State	n.a.	+	-

These basic-level constellations, however, are not fully determinative of the aspectual properties of a predicate, as they can be shifted by other elements. We have seen some examples of aspectual shift in §3.2.2 above, but Smith discusses also a kind of shift wherein only part of a situation is focused on. This is accomplished by means of what Smith refers to as *super-lexical* morphemes, including *start*, *begin*, *continue*, *finish*, and *stop*. These morphemes are “super-lexical” in that they “modulate the focus of a situation rather than determining the situation itself” (ibid.:75-76). For example, in (110a), we have the Activity *cook*, which in (110b) is shifted; the addition of *finished* supplies a focus on the endpoint, and thus yields an Accomplishment:

- (110) a. Will is cooking. [atelic]  
       b. Will finished cooking. [atelic → telic]

In languages such as Russian, such morphemes are realized as verbal inflections; Smith cites the contrast between *govorit* ‘speak’ and *zagovorit* ‘begin to speak’ (ibid.:76).

In addition to shifted situation types, *derived* situation types are also possible. These are complex predicates with an internal structure that consists of multiple basic-

level situations. One of these derived situation types Smith refers to as *multiple-event Activities*; these consist of “an unbroken series of sub-events which are conceptualized as a single, ongoing event” (ibid.:85):

- (111) a. Beverly repeatedly coughed.  
       b. Miles found his pipewrench every time we hid it.<sup>103</sup>  
       c. Geordi fed Spot for years.

In (111a), we have an Activity in which multiple events of the Semelfactive *cough* are repeated; (111b) is an Activity in which we have multiple instances of the Achievement *find his pipewrench*, and in (111c), we have an Activity in which the Accomplishment *feed Spot* is regularly repeated.<sup>104</sup>

Although Smith’s shifted and derived situation types account well for the compositionality of aspectual properties, this composition is *not* fully monotonic, as the inherent semantic properties of the verb are not preserved under composition, with the meaning of additional elements being additive. Rather, Smith’s model is (partially) *nonmonotonic*, with part of the inherent semantics of a verb supplanted by the semantic features of other elements. For example, if atelicity is an inherent, semantic feature of *cook*, then the telicity of *finish* is supplanting this part of its semantics in (110a).

I will note that this criticism applies to Smith’s cases of shifted situation types, but *not* to her cases of derived situation types. Derived situation types are monotonically

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<sup>103</sup> I believe Smith would actually classify this sentence as *habitual*, not as a multiple-event Activity, but the distinction is not important here.

<sup>104</sup> MacDonald (2008a-b) refers to such interpretations as *series-of-identical-events* (SIE) readings.

composed in that the semantics involved in the individual events are not supplanted in deriving a complex situation type; rather, the individual events are referred to collectively, creating a situation type composed of these sub-events, whose semantics are left intact. Smith writes that their “truth conditions are unrelated to the truth conditions of the corresponding basic-level sentences” to which they refer (ibid.:85); in other words, they express different propositions. In (111c) above, for example, the propositions *Geordi fed Spot* and [*Geordi fed Spot*]*for years* represent two independent situation types, the first a telic Accomplishment and the second an atelic Activity, consisting of a series of telic Accomplishments. This distinction will be important in the following section, where I consider a fully monotonic model of aspectual composition.

### 3.2.5 Olsen’s privative features model

As noted above, most models which decompose Vendler’s classes into features assume binary oppositions encoded by *equipollent* features, as for example Smith’s (1991) [+/-Durative], [+/-Telic], and [+/-Stage]. With equipollent features, both the positive and negatively marked features carry equal semantic weight. However, Olsen (1997) notes a systematic asymmetry in the semantics of these features, arguing that clear instances of aspectual shift apply exclusively to verbs with (putatively) *negatively* marked features.

This asymmetry is apparent with respect to telicity in (112a-b), where [-Telic] *bike* is quite straightforwardly shifted to [+Telic] *bike to the library*. However, no constituent can then cancel the (derived) telicity of *bike to the library* (112c):



- (112) a. Keiko biked.  
 b. Keiko biked to the library.  
 c. #Keiko biked to the library for hours.  
 d. Keiko biked to the library for years.

In (112c), we see that the telic predicate *bike to the library* rejects the adverbial *for hours*; the adverbial cannot force an atelic reading, in which Keiko is aimlessly *biking to the library* without any end in mind.

The only way to get a felicitous result with *for hours* is if we change the timescale, as in (112d). However, the available interpretation in (112d) is *not* actually an atelic reading of *bike to the library*. Rather, the atelic interpretation is of the iterative *series* of Keiko's trips to the library, a series of individual *telic* Accomplishments. As noted in the previous section, Smith (1991) refers to this as a multiple-event Activity;<sup>105</sup> MacDonald (2008a-b) characterizes the interpretation of such predicates as a *sequence-of-identical-events* (SIE) reading. The SIE interpretation is pragmatically unavailable for (112c), but is available for (112d).<sup>106</sup>

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<sup>105</sup> See §3.2.4 above.

<sup>106</sup> Note that such judgements depend on real-world knowledge; if a single trip to the library required years of bicycle travel, (112d) would be infelicitous as well. Similarly, (112c) might allow an iterative SIE reading if the distance to the library was quite small. There is also the complication of whether *bike to the library* refers to the entire quantized distance from Mary's house (say, exactly two miles), or whether it can refer to multiple parts of that distance, in which case there are multiple cumulative sub-events. For more on such quantized predicates and their relationship to the notion of telicity, see Krifka (1992).

Thus, we see that although atelic predicates can be shifted to telic interpretations, the reverse is not true; telic predicates remain telic.<sup>107</sup> Olsen (ibid.:17) argues that the interpretation of a verb like *bike* as atelic is not a semantic interpretation, but merely a pragmatic implicature, as in Grice (1975). One of the generally accepted diagnostics for this difference is the following: pragmatic implicatures may be cancelled by adding clarifying elements, but cancelling semantic meanings results in contradiction. Olsen illustrates with the following examples:

- (113) a. Elsie plodded along, #but not slowly.  
       b. Margaret plodded along, although she wasn't tired.  
       (Olsen, 1997(14a,15a))

In (113a), we can see that 'slowly' is part of the semantic meaning of *plod*, as it cannot be cancelled; (113a) is at best anomalous.<sup>108</sup> However, 'tired' is a pragmatic implicature, not part of the semantics of *plod*, as it can be cancelled without any contradiction (113b).

Similarly, although punctual predicates can be shifted to durative interpretations as, e.g., when *die* is used in the progressive (114a), durative predicates cannot be shifted to punctual interpretations by the addition of punctual modifiers (114b):

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<sup>107</sup> Dowty (1979:65) notes that "[w]hat all accomplishments have in common is the notion of a specific goal or task to be accomplished," regardless of whether that endpoint has been reached in a given presentation of a situation. In the simple past, we interpret the endpoint as having been reached, but when the same predicates occur in the progressive, the interpretation is that the endpoint has *not* yet been reached. Nonetheless, "we understand that the action the subject performed was the same kind as before"; the inherent telicity of the predicate is unaffected by such variations in presentation.

<sup>108</sup> For (113a) to be felicitous, we would need to be judging *plod* and *slowly* by different metrics. One might imagine a cheetah *plodding* along, exhausted, at a mere 35 mph; this would be half of its top sprinting speed, but compared to other land animals, it would not be moving *slowly*.

- (114) a. John had been dying for hours. [punctual→durative]  
 b. Vincent painted a picture at noon.  
     i. \*‘Vincent began and finished it at noon’ [durative→\*punctual]  
     ii. ‘Vincent began it at noon’ [durative→durative/inceptive]  
 c. Vincent began painting a picture at noon. [durative→durative/inceptive]

Rather, when punctual adverbials combine with durative predicates such as *paint a picture*, they are interpreted as highlighting only the beginning point of the durative situation, one that is still understood to unfold over time. In (114b), the felicitous interpretation is not that the painting occurred precisely at noon (114b.i), but that it *began* at noon (114b.ii), as in (114c). Note that this predicate cannot occur with adverbs which entail a sudden change of state:

- (115) \*Vincent suddenly painted a picture at noon.

This interpretation fails because *paint a picture* is semantically durative, and necessarily occurs over a period of time. The punctual adverbial in (114b), then, is not altering the underlying durativity of the predicate, merely highlighting its initial point.<sup>109</sup>

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<sup>109</sup> Note the distinction between the use of the “super-lexical” morphemes (Smith, 1991) *finish* in (110b) and *begin* in (114c). When *finish* is added to atelic *cook* as in *Will finished cooking*, the predicate has a telic interpretation, as *cooking* now has an endpoint, as it also does in telic *Will was cooking dinner*. However, as with *at noon* in (114b), *begin* in (114c) does not change the durativity of the situation, but merely highlights its initial point.

For Semelfactives, the implicature of punctuality is generally quite robust, and so when Semelfactives appear in durative contexts, as in (116), the most natural interpretation is of a derived, iterative series of punctual events, rather than an individual durative Activity:

(116) The horse was kicking despite the jockey's best efforts.

However, a durative single-event reading is possible given the right timescale:

- (117) a. Jean-Luc's horse was kicking [a single kick] at the moment he fell off.  
 b. Slowing down the film, we see the horse kicking during the first 600ms.

Thus we see that with Semelfactives, too, punctuality is merely a pragmatic implicature. The asymmetry between durativity and punctuality, then, is precisely like the asymmetry between telicity and atelicity; only the negatively marked member of the opposition can be cancelled.<sup>110</sup>

The formal mechanism Olsen proposes to address this asymmetry is that of a *privative* (+/Ø) system of features: +Telic, +Durative, +Dynamic.<sup>111</sup> In this model, which I illustrate in Table 3 below, features are either marked or unmarked; a verb may be, for

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<sup>110</sup> Olsen describes a similar asymmetry between dynamicity and stativity (ibid.:35-41), in which states can be shifted to dynamic interpretations (as in imperatives, e.g., *Love your enemies*), but dynamics cannot be shifted to states. As this feature plays no role in my argument, I leave its specifics to the side.

<sup>111</sup> Privative features, of course, have also been argued for in the domain of phonology, for example, in Lombardi (1991; as cited in Kim, 2002:2).

example, either +Telic or unspecified for telicity. Positively marked features “contribute uniformly” to aspectual composition (ibid.:30), but unmarked features do not; the interpretation of these features as negative, Olsen argues, is pragmatic, not semantic, and this negative interpretation is thus cancellable in felicitous contexts.

In such a system, then, no “aspectual shift” has taken place in (111b) (repeated here as (118b)) due to the Goal being added to *biked*; rather, a sort of disambiguation has occurred. The verb *bike* is unmarked for telicity, and when occurring alone is pragmatically interpreted as atelic. Adding a Goal contributes a [+Telic] feature to the verbal constellation, with the result that the predicate is now [+Telic].

- (118) a. Keiko biked.  
b. Keiko biked to the library.

Note that this contribution is fully monotonic, that is, meaning-preserving; this is possible due to the privative features assumed in this model. Equipollent models necessarily involve nonmonotonic processes in which the semantics of individual lexical items are supplanted in composition. Given that outside of the domain of aspect, the semantics of a sentence is generally a monotonic function over the semantics of its components, Olsen’s monotonic model, if it can be shown to be empirically adequate, would seem to be *a priori* preferable to models that are not fully monotonic.

*Table 3: Olsen's (1997) privative features model of lexical/inner aspect*

	Telic	Durative	Dynamic
Accomplishment	+	+	+
Achievement	+		+
Activity		+	+
Semelfactive			+
State		+	
Stage-level state <sup>112</sup>	+	+	
[unattested] <sup>113</sup>	+		
[unattested]			

### 3.2.6 The model of lexical/inner aspect adopted here

In what follows, I adopt Olsen's system except where noted, although in §3.6 it will be slightly modified to account for the aspectual properties of idioms. Here I briefly make explicit what I will be assuming in the remainder of this chapter.

In this model, verbs are characterized by some combination of the privative features [+Telic], [+Durative], and [+Dynamic]; these features are inherent and semantic, part of the structural meaning of a verb (in the sense of Rappaport Hovav & Levin, 1998).<sup>114</sup> Where these features are left unspecified, pragmatic implicatures of atelicity, punctuality, and stativity (respectively) will hold unless cancelled by another constituent. The set of positively marked features determines the lexical or inherent aspectual properties of a verb. As a convenient shorthand, I will continue to refer to Smith's (1991)

<sup>112</sup> Stage-level states are those which are inherently telic, e.g. *be pregnant*, *be alive*.

<sup>113</sup> Olsen (ibid:50-53) argues that these categories are unattested because of a general restriction on the category *verb*, which must minimally involve an interval. The feature +Durative directly entails an interval, and the features +Telic and +Dynamic indirectly entail an interval, as two points in time are necessary for one to be regarded as the end point, or for a change in state to occur.

<sup>114</sup> I discuss this in greater detail in §3.4.1.

situation types (based on Vendler, 1967, and Comrie, 1976) to characterize the lexical aspect of a verb, but it should be understood that the set of positively marked features, combined with the pragmatic implicature that unmarked features are interpreted as negatively marked, is what actually determines the lexical aspect of a verb.<sup>115</sup>

For example, a given verb may be either a State [+Durative], Semelfactive [+Dynamic], Activity [+Durative, +Dynamic], Achievement [+Telic, +Dynamic], or Accomplishment [+Telic, +Durative, +Dynamic]. This cluster of features comprises its lexical or inherent aspect. (I will also sometimes refer here to a class of verbs that share a feature as (e.g.) “durative verbs”; durative verbs include States, Activities, and Accomplishments, but exclude Semelfactives and Achievements.)

Next, we have the level of inner aspect, in which the lexical aspect of a verb combines with other elements in a monotonic process of composition. The inherent semantic features of the verb—[+Durative], [+Dynamic], and [+Telic]—cannot be altered by this process, but pragmatic implicatures arising from unmarked features can be cancelled by other elements here. For example, Activities are unmarked for telicity, and thus they are interpreted as atelic via pragmatic implicature. However, adding a Theme or Goal to an optionally transitive Activity will add a [+Telic] feature, with the verb phrase as a whole now bearing the semantic features [+Durative], [+Dynamic], and [+Telic].

Note that although these features may only be positively marked on verbs lexically, this is not the case for other constituents. For example, the punctual adverbial *at [time]* is inherently [-Durative]. If it combines with an Achievement such as *die*, then the

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<sup>115</sup> I take no position on whether these features have an internal structure, e.g., whether a separate level of event structure exists in the lexical semantic representations, as in Pustejovsky (1991).

pragmatic implicature is reinforced, and the verb phrase as a whole will now have the semantic features [+Telic, -Durative, +Dynamic].

The inner aspect of a verb then forms the input to aspectual composition outside of the verb phrase, what I refer to here as *outer aspect*, as in MacDonald (2008a-b).<sup>116</sup> ; The only component of outer aspect relevant to the discussion of idioms in §3.4-5 will be the English progressive, and so will be the only one I consider here; I refer the reader to Olsen's chapters on grammatical (outer) aspect for what a monotonic process of composition looks like for outer aspect.

### 3.3 *Some tests for aspectual features*

Dowty's (1979:51-65) tests for aspectual class have been perhaps most widely employed by subsequent commentators, despite limitations in some of the tests (for a review, see Walková, 2012). Here I will review some of the more rigorous of the tests for telicity and durativity proposed by Dowty, as modified by Smith (1991), Olsen (1997), MacDonald (2008a-b), and others.

#### 3.3.1 *Tests for telicity*

Verbs unmarked for telicity can readily be modified by durative *for [time]* adverbials (Dowty, 1979:56), as in the Activity in (119), where a single event of walking is involved:

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<sup>116</sup> Smith (1991) refers to this as *viewpoint aspect*; for Olsen (1997), this is *grammatical aspect*.



- (119) John walked for hours.

However, telic predicates generally can't be similarly modified (120a, 121a), except under derived, multiple-event readings where the same telic event takes place multiple times (Smith, 1991:85-87). In (120b, 121b), this gives rise to a series-of-identical-events (SIE) reading; the same snake in (120b) and the same goat in (121b) are involved in each event in the series. If the object is a bare plural, on the other hand, telic predicates yield a series-of-similar-events (SSE) reading (120c, 121c), where a similar event is repeated with different objects (MacDonald, 2008a-b).

- (120) a. #John noticed the snake for hours.  
       b. John noticed the snake again and again for hours.  
       c. John noticed snakes for hours.
- (121) a. #John carried the goat into the barn for an hour.  
       b. John carried a goat into the barn again and again for an hour.  
       c. John carried goats into the barn for an hour.

(Adapted from MacDonald, 2008a(2,5-7,12,14,16,28))

The (b-c) cases represent iterations of Achievements (120b-c) or Accomplishments (121b-c); rather than Activities (Olsen, 1997:33). As such, the telicity is maintained in the interpretation of the verb, even as the overall series of iterated events is interpreted as lacking a natural endpoint.

Next, telic Accomplishments can be modified by frame adverbials such as *in [time]* phrases,<sup>117</sup> as in (122), but verbs unmarked for telicity generally can't be (123a), unless an inceptive reading is intended (123b), or unless a goal is contextually supplied (123c), turning the Activity into an Accomplishment:

(122) John built a house in three months.

(123) a. #John walked in three minutes.

b. John walked [away] in three minutes, but it was an hour until Mary did.

c. John walked [e.g., to the store] in three minutes, but it took Mary ten minutes to get there.

As can be seen from (123b-c), the presupposition underlying the infelicity of (123a) is cancellable, suggesting that its atelicity is pragmatic in nature, and not part of the semantics of the verb *walk*.

The same is true for Semelfactives, which like Activities are not inherently telic (Smith, 1991:55-57; Olsen, 1997:46-48). As such, (124a) is infelicitous under the culminative interpretation in (124a.i), but acceptable under the inceptive interpretation in (124a.ii). This can be seen clearly in (124b), where the inceptive reading is explicitly indicated. Note also that adding a Theme argument to a Semelfactive, as in (124c), produces a telic Achievement (Olsen, 1997:46).

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<sup>117</sup> Frame adverbials are ambiguous in English: *in three minutes* could mean either 'after three minutes had passed', as in (121b), or 'throughout the course of three minutes', as in (121c). Both readings are available with Achievements, but only the latter is available with Accomplishments. See the following section on durativity tests.

- (124) a. #Jean-Luc's horse kicked<sup>118</sup> in ten seconds.
- i. #'Jean-Luc's horse kicked once throughout ten seconds'
- ii. 'Jean-Luc's horse kicked after ten seconds'
- b. Jean-Luc's horse kicked in ten seconds, but Vash's didn't kick for two minutes.
- c. Jean-Luc's horse kicked the bellicose goose.

When verbs unmarked for telicity combine with the present progressive, as in the Activity in (124a), they entail the corresponding perfect form (Dowty, 1979:57). This is not the case for telic predicates, however, as is clear from the Accomplishments in (124b-c) and the Achievement in (124d):

- (124) a. John is walking  $\models$  John has walked
- b. John is walking to the store  $\nmodels$  John has walked to the store
- c. John is building a house  $\nmodels$  John has built a house
- d. John is dying  $\nmodels$  John has died

The telicity involved in the predicates in (124b-d) is semantic, not pragmatic, and the progressive directly indicates that the endpoint involved has not been reached as of the reference time; the entailment therefore fails.

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<sup>118</sup> Although perhaps usually transitive, an intransitive variant of *kick* does indeed exist, at least in equestrian speech communities: "Horses kick for a number of reasons. . . [t]hey may kick or stamp if something like a prickly weed tickles their legs or belly" (Blocksdorf, 2018).

### 3.3.2 Tests for durativity

Tests for durativity are primarily used to distinguish durative Accomplishments from nondurative Achievements. Perhaps the most reliable test to distinguish a durative verb  $\phi$  from a nondurative verb is the following: “x  $\phi$ ed in an hour entails x was  $\phi$ ing [at all times] during that hour” is true for Accomplishments and false for Achievements (Dowty, 1979:59-60). This entailment holds for the Accomplishment in (126a), but fails for the Achievement in (126b):

- (126) a. John wrote the poem in an hour  $\models$  John was writing the poem at  
all times during that hour
- b. John died in a week  $\not\models$  John was dying at all times during that week

Dowty initially (1979) chalked up this contrast to an equipollent semantic feature [+/- Durative], but later (1986) retreated on this point, arguing that the contrast is merely pragmatic. Achievements, he claimed, are merely predicates with shorter durations, “which we do not normally understand as entailing a sequence of sub-events” (1986:43); this results in an implicature of punctuality. Accomplishments, however, “normally and usually” involve recognizing such sub-events. Thus he collapses them into a larger category of “kinesis” predicates, those which are [+Telic].

Olsen (1997:41-44), though, argues that this retreat was only half correct. It is indeed true that Achievements can be either punctual or durative; the entailment therefore fails in (126b), as either a punctual, inceptive reading or a durative, preliminary-stages reading of the premise is possible. This is due to the ambiguity of the *in [time]* adverbial;

it can mean either ‘John died suddenly after a week had passed’ (the punctual, inceptive reading), or that ‘John was dying throughout the entire week’ (the durative, preliminary-stages reading). Unlike Achievements, however, Accomplishments are exclusively interpreted as durative. The punctual, inceptive reading is impossible for the Accomplishment in (126a); as a result, no ambiguity is present, and the entailment goes through.

When Achievements combine with the progressive, however, the reading is unambiguously durative, as in (127):

(127) John was dying when I came to visit him.

In such contexts, the reference time lies not at the moment of death, but rather in its preliminary stages. The usual conception of death as a punctual event with no preliminary stages is thus cancelled, and the Achievement now has a durative Accomplishment reading instead. This can be seen as well for *arrive* in (128a); the implicature of punctuality is cancelled, and the predicate is interpreted as durative.

- (128) a. John was arriving while the national anthem played.  
b. John was arriving later and later each day.

However, unlike *dying*, *arriving* is an iterable event, and in durative contexts can also produce a derived, iterative, multiple-events reading (Smith, 1991). Therefore

MacDonald's (2008a-b) SIE interpretation is possible in (128b), involving a durative sequence of punctual, telic events.

### 3.3.3 *Semelfactives*

I have discussed in this section some of Dowty's (1979:51-65) tests for aspectual class (as modified by Smith (1991), Olsen (1997), MacDonald (2008a-b), and others), along with how to interpret the results in a privative features system. I would like to note, however, that Dowty does not discuss specific tests for Semelfactives. Indeed, although most authors admit them as a class and characterize them informally (e.g., Smith, 1991:55-57), I've come across only one formal test (Toledo, 2008)<sup>119</sup> that distinguishes Semelfactives from other situation types: in the context of durative adverbials, Semelfactives most naturally have a derived, multiple-event reading, i.e., an iterative reading; this is true when they appear with the progressive, as well.<sup>120</sup> This feature of Semelfactives will be important when I consider the idioms *kick the bucket* and *kick the habit* in §3.4.3-4 below.

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<sup>119</sup> In fact, an exclusive Google search for the string "tests for Semelfactives" yields exactly one result: Toledo's dissertation.

<sup>120</sup> This is due not only to the strong implicature of punctuality with this situation type, but also to the implicature of atelicity. As Smith notes (ibid.:56), the atelicity of Semelfactives makes the "preliminary stages" reading which is possible with Achievements (as in *John had been dying for weeks*) unavailable.

### 3.4 Aspectual (non)compositionality in phrasal idioms

In this section, I consider the conflicting arguments of McGinnis (2002, 2005) and Glasbey (2003, 2007) on the compositionality of idioms, as well as some attempts to reconcile these positions (Leivada, 2017; Mateu & Espinal, 2007). I conclude that at least some phrasal idioms are noncompositional in their aspectual properties, and that Glasbey's claims are therefore substantiated. I add further evidence to this debate by looking closely at the aspectual properties of *kick the bucket* and *kick the habit*; despite sharing a verb and a definite internal argument, I show that they nonetheless differ in terms of their inherent aspect. Finally, I look at a number of idioms with roughly the same meaning as *kick the bucket*, showing that although all have the same basic semantic properties as *die*, some are semantically punctual and others semantically durative.

#### 3.4.1 Aspectual properties of fake resultatives

As noted in the introduction, McGinnis (2002, 2005) argues that the aspectual properties of a phrasal idiom are compositionally determined from the normal semantic values involved in a literal reading of its constituents. She notes that aspect is a structural component of meaning, not an idiosyncratic one, citing the distinction as formulated by Rappaport Hovav and Levin (1998): the *structural component* of a verb's meaning is that part which is "grammatically relevant. . . to determining the semantic classes of verbs whose members share syntactically- and morphologically-salient properties." The *idiosyncratic component* distinguishes a verb "from other verbs sharing the same structural aspects of meaning"; this idiosyncratic component is not relevant to the

grammar (ibid.:105-6). For example, the verbs *sweep* and *wipe* both belong to the same semantic class, and thus share the structural component of their meanings. They therefore have the same syntactic distribution:

- (129) a. Terry (wiped / swept) the table.  
 b. Terry (wiped / swept) the crumbs into the sink.  
 c. Terry (wiped / swept) the floor clean.

(Adapted from Rappaport Hovav & Levin, 1998(4b-c,e))

Rappaport Hovav and Levin argue that these idiosyncratic differences in meaning—here the difference between *wiping* something and *sweeping* it—are irrelevant with respect to grammatical properties such as argument structure.

Marantz (1997) argues that the structural components of meaning are assembled in the syntax, and that the idiosyncratic components are added later, at the semantic interface.<sup>121</sup> Aspect is such a structural property; morphemes belong to certain semantic classes regardless of their idiosyncratic differences, and this is reflected in the syntax. Somewhat in passing, Marantz notes that as a result of this view, *kick the bucket* cannot mean ‘die’:

As has been pointed out by many linguists, “die” does not have the same aspectual properties as “kick the bucket,” which itself carries the semantic implications of a transitive verb phrase with a definite direct object (and thus

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<sup>121</sup> I will have much more to say on this model (*Distributed Morphology*), as well as the interfaces, in Chapter 4.



“kick the bucket” is aspectually similar to “pass away,” whereas “die” is more like “jump” or, perhaps, “fall”). So one can say, “he was dying for three weeks before the end,” but not, “\*he was kicking the bucket for three weeks....”<sup>122</sup>

(Marantz, 1997:212)

McGinnis (2002) formalizes this claim, to the effect that that “even if a VP has a noncompositional idiosyncratic meaning, it will have a compositional structural meaning,” and in particular “the same aspectual properties as any VP with the same syntactic properties” (ibid.:668). Under this view, an idiomatic reading of a VP with an idiom such as *kick the bucket* will combine with other structural components of meaning to yield the same aspectual properties as in a VP where *kick the bucket* is interpreted literally. Therefore, sentences such as (97a-b), repeated here as (130a-b), will have precisely the same aspectual properties:

- (130) a. [ID] John kicked the bucket.  
b. [LIT] John kicked the bucket.

Glasbey (2003, 2007) responds that some idioms, nonetheless, seem to belong to a different aspectual class than that of their literal readings, citing the idiom *paint the town red* as an example. Note the contrast between (131a) and (b):

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<sup>122</sup> Although *kick the bucket* (as we shall see) has a more specific meaning than ‘die’ in that it seems to be obligatorily punctual, I fail to see how transitivity or definiteness are in any sense involved in its *semantics*, which seem rather to carry the implication of unaccusativity.

- (131) a. [ID] Mary and her friends painted the town red (for a few hours / #in a few hours).  
 b. [LIT] Mary and her friends painted the town red (\*for a few hours / in a few hours).

Under the idiomatic reading in (131a), *in a few hours* is acceptable only on an inceptive reading, in which the activity begins after a few hours, suggesting that the idiom is normally atelic.<sup>123</sup> Under the literal reading in (131b), *for a few hours* seems to be entirely unacceptable.<sup>124</sup> This is because under a literal interpretation, *paint the town red* represents a *resultative* construction (Simpson, 1983; Rappaport Hovav & Levin, 2001), one whose telicity is compositionally determined from the semantics of its components. Under a monotonic analysis (Olsen, 1997), *for [time]* adverbials are predicted to be impossible with resultative predicates; the telicity of these predicates is semantic, and thus uncancellable.

We can see the same contrast from the progressive-perfect entailment test, which targets a point in time before any telos is reached, in (132a-b). For Activities, the present progressive entails the perfect, as an atelic eventuality can be interrupted but still be deemed to have transpired. For Accomplishments, however, the telic eventuality will be incomplete at the time of the interruption, and the entailment therefore fails.

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<sup>123</sup> A search of BYU's new iWeb corpus fails to find any instances of the *in [time]* adverbial in the context of 636 entries for *the town red*. However, a Google search finds some results: the Facebook page for the NBC show Chicago Fire has the line, "We're going to paint the town red in TWO WEEKS!" (Chicago Fire, 2018). So, although the inceptive reading may be quite rare, it does seem possible.

<sup>124</sup> Changing the time period to *for a few years* allows for the derived series-of-identical-events (SIE) reading (MacDonald, 2008a-b), as it's then possible to imagine that, for example, Mary and her group of friends are employed on an annual basis to (literally) paint the town.

- (132) a. [ID] Mary and her friends are painting the town red  $\models$  they've [ID]  
 painted the town red<sup>125</sup>
- b. [LIT] Mary and her friends are painting the town red  $\not\models$  they've [LIT]  
 painted the town red

Glasbey (2003:44) concludes that *[ID] paint the town red* is atelic, despite *[LIT] paint the town red* being telic. The former, it would seem, is an Activity, whereas the latter is an Accomplishment; a town has not been literally painted red until it's red all over (so to speak). She argues that idioms like *paint the town red* are what Jackendoff (1997a) refers to as *fake resultatives*. On the literal reading of (132b), we have a change in state from a state in which 1) the (literal) town is some color besides red, to a state in which 2) the town is red. On the idiomatic reading (132a), however, no such change in state is involved; there's just an Activity meaning something like 'revel' or 'raucously celebrate', and indeed the "town" in question is largely unaffected by the activity.<sup>126</sup>

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<sup>125</sup> I have confirmed these judgements with a small group of informants, although of course more rigorous means of obtaining this data would be desirable (but see Sprouse, Schütze, & Almeida, 2013, on the convergence between informal and formal methods). Note also that idiolectal variation is possible. Neither Glasbey nor I claim that *every* idiom will have different aspectual properties from a literal reading of its components, as some might purely by chance. I merely claim that *some* idioms are aspectually noncompositional, and that McGinnis's generalizations are thereby falsified.

<sup>126</sup> One might not need to even be in an urban setting to paint the town red. Having spent part of my undergraduate years at a small college in the woods, to my ears *paint the town red* is potentially applicable in a situation where the revelers in question rove from dorm to dorm. See Glasbey (2007:fn. 8) on this point; she suggests that at the very least, "going out somewhere" is required. No matter how vigorous and well-attended the celebration, then, one cannot *paint the town red* at home.

Glasbey (ibid:4-5) cites also idioms such as *cry one's eyes out* and *sing one's heart out* as additional examples of fake resultatives; both idioms appear to be atelic, despite their literal readings (improbable as they are) being telic:

- (133) a. [ID] John cried his eyes out for hours / #in an hour.  
 b. [LIT] John cried his eyes out \*for hours / in an hour

Glasbey reports that her web search for *cried X's eyes out* failed to find any examples with an *in [time]* adverbial. I have confirmed this in a search of the Corpus of Contemporary American English (COCA; Davies, 2008-), in which I found 154 entries for the string *X's eyes out* occurring as a collocate of either *cry*, *bawl/ball*, *sob*, or *weep*.<sup>127</sup> Two appeared with a *for [time]* adverbial, but none appeared in the context of an *in [time]* adverbial. Again, this is not surprising if these idioms are normally atelic Activities, despite their literal readings being telic Accomplishments.

Jackendoff (1997a), too, agrees that *cry X's eyes out* and *sing X's heart out* are atelic, noting that despite having the syntax of resultatives, “the NP + particle combination [in these idioms] carries a sort of adverbial force, denoting intense and perhaps passionate activity” (ibid.:551-2).<sup>128</sup> The literal readings of *paint the town red* and *cry one's eyes out* both have natural endpoints (i.e., the town being completely red

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<sup>127</sup> In fact, only 101 of these entries (65.6%) involved *cry*, with 44 (28.6%) involving *bawl* (or its misspelling *ball*). One possible explanation is that the idiom involves an abstract root with the meaning ‘cry’, i.e.,  $\sqrt{\text{CRY}}$  *X's eyes out*, with the specific verb chosen as an exponent free to vary; I reconsider this issue in Chapter 4.

<sup>128</sup> For a cross-linguistic perspective on this, see Farkas (2010, 2011), who distinguishes between “false” and “weak” resultatives in Romanian.

and one's eyes being out of their sockets), but the idiomatic readings have no such natural endpoints. Thus fake resultative idioms, at least, are counter to McGinnis's hypothesis.

### *3.4.2 Noncompositional compositionality: Having one's cake and eating it*

Thus it would seem that we have at least one class of idioms that directly tell against McGinnis's (2002, 2005) generalizations. In the next few sections I will consider a broader range of idioms, but first I want to briefly deal with some interesting attempts to rescue McGinnis's claim for compositionality by reconciling it with Glasbey's observations. Although these attempts accomplish this objective, they do so only by undermining the rationale behind McGinnis's claim.

Leivada (2017) notes that in the framework of Distributed Morphology (DM; beginning with Halle & Marantz, 1993), some components of meaning are added postsyntactically by "Encyclopedia entries." This special interpretive list adds:

[T]he idiomatic meaning (i.e. in the form of contextual specifications on the meanings inserted into individual roots — for example, assign 'kick' a special meaning in the appropriate local context of the DP 'the bucket') and, as happens with non-idiomatic language, part of this semantic content

encodes aspectual information. In this context, every IP [idiomatic phrase]<sup>129</sup> is syntactically assembled in a compositional way, identical to that of its non-idiomatic counterpart (Leivada, 2017:12).

For Leivada, then, a fake resultative idiom may be compositionally telic only to have an atelic idiosyncratic meaning added post-syntactically. But McGinnis (2002) explicitly claims that aspect is a structural component of meaning, not an idiosyncratic one: “One reason to suppose that aspect is a structural component of meaning is that it interacts with structural properties of the sentence” (ibid.:668). Indeed, as noted above, Marantz (1997) argues precisely the same thing; the syntactic derivation of an idiom like *kick the bucket* affects its aspectual properties, so that it “carries the semantic implications of a transitive VP with a definite direct object” (ibid:212). The central thesis behind DM is that only the structural components of meaning are attached to the roots processed in narrow syntax, and that everything idiosyncratic is added postsyntactically (along with the phonological exponents of the roots). As McGinnis notes, aspectual information must be structural, as it affects combinatorial possibilities in the syntax. Leivada may or may not be correct that inner aspect in idioms is idiosyncratic, not

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<sup>129</sup> See §2.2.5 here. Nunberg, Sag, & Wasow (1994) distinguish between *idiomatic phrases* (IPs) and *idiomatically combining expressions* (ICEs); only for the latter is the meaning of an idiom distributed among its parts. Glasbey (2003, 2007) hypothesizes that only ICEs undergo aspectual composition, and so McGinnis’s (2002) claim may be true with respect to ICEs but false with respect to IPs. The validity of the distinction between these types of idioms, however, has been questioned (Espinal & Mateu, 2010:§2); regardless, it seems to me that idioms of both classes are aspectually noncompositional (see §3.4.3-4 below, with *kick the bucket* being an IP for Nunberg et al. (1994:497) and *kick the habit* (presumably) being an ICE, as *the habit* can be displaced: *The habit he kicked was a tough one*).

structural, but if it is idiosyncratic, this undermines the rationale for McGinnis's argument entirely.

A similar attempt (although from a different quarter) comes from Mateu and Espinal (2007), who attempt to reconcile McGinnis's and Glasbey's positions by arguing that the structurally-derived properties that McGinnis argues for are subsequently altered by cognitive processes "which lie outside the computational system of grammar. . . activated at the final level of utterance interpretation" (ibid:55). By these processes, a structurally telic idiom is idiosyncratically interpreted as atelic, and so Glasbey's observations are derived. They note that this position is not identical to the claim that the aspectual properties of idioms are due to "arbitrary syntactic-conceptual correspondences" (as in their reading of Jackendoff 1997a-b, 2002, and as in Leivada's idiosyncratic readjustment). Rather, they argue that the altered reading arises from "regular metaphorical and metonymic modes of thought that are dynamically activated in the process of idiom comprehension" (ibid.:55), as in the system of conventional metaphors in (e.g.) Lakoff and Johnson (1980) and Gibbs (1995).<sup>130</sup>

Although this view differs greatly from Leivada's in its specifics, in practical terms it undermines McGinnis's claims in precisely the same way. The structural, compositional process by which the aspectual properties of an idiom are derived is insufficient to determine its aspectual class, and secondary measures must be called upon to adjust these properties so as to fit with the data. It seems to me that both approaches amount to having one's cake and eating it, and that it's far more parsimonious to

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<sup>130</sup> Assessing such a system would take us well beyond the scope of this dissertation, but see Keysar & Bly (1999) for a critique of conceptual structure accounts of idiomaticity.

conclude that idioms are noncompositional with respect to the normal meanings associated with their components.

### 3.4.3 Idioms and aspectual shift: *Progressively kicking the bucket?*

It is conceivable that the aspectual properties of idioms are in general compositional, but that fake resultative idioms constitute an exception, set off by some independent principle. In order to extend the argument, then, I consider in the next three sections a wider range of phrasal idioms, beginning here with *kick the bucket*.

McGinnis (2002:670) writes that in some cases, “idiomatic and nonidiomatic counterparts may have the same grammatical aspect, but a particular reading may be ruled out for pragmatic reasons.” For example, she claims that an iterative reading is pragmatically unavailable for the idiom in (134), despite being available for its literal counterpart:

(134) a. [#ID/LIT] Hermione was kicking the bucket for weeks.

(McGinnis, *ibid.*(11b))

Under a literal reading of (134), the Semelfactive *kick* combines with the Theme *the bucket*, which adds a [+Telic] feature, thus producing the Achievement *kick the bucket*. This then combines with the progressive and the durative adverbial to produce a derived



iterative reading,<sup>131</sup> where Hermione is kicking the (literal) bucket again and again, in a series of punctual events. For the idiom *kick the bucket*, however, the iterative reading is impossible (in fact, *no* idiomatic interpretation is available; the idiom refuses to combine with the progressive at all).

Despite this, McGinnis claims that literal and idiomatic *kick the bucket* are identical in terms of their aspectual properties, and that the idiom is anomalous with the progressive merely because of real-world knowledge concerning the noniterable nature of death. In contexts where “dying” can happen repeatedly, then, an iterative reading should be available. The fantastical context she chooses to illustrate this is the mythical phoenix, which regularly dies and is resurrected:

(135) a. The phoenix kicked the bucket every 500 years for millennia.<sup>132</sup>

b. The phoenix bit the dust for three days, then rose again from its ashes.

(McGinnis, 2002(22); her judgements)

The SIE reading, where a series of punctual events occur, is available for (135a). (For me, however, (135b) borders on gibberish, in part because *bite the dust* is semantically

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<sup>131</sup> This is MacDonald’s (2008a-b) *sequence-of-identical-events* (SIE) reading. There is also a possible single-event reading of (134), but as noted in §3.2.5 above, the implicature of punctuality is quite robust for Semelfactive verbs, so the preferred reading is the SIE one indicated here.

<sup>132</sup> Leivada (2017:10-11) reports on a seemingly identical idiom in Cypriot Greek, which likewise cannot occur with durative adverbials, even in contexts where iterative deaths are possible:

i. [ID] \*O Finikas eklotsise ti sikla ja xilieties  
the Phoenix kick.past.perf.3sg the bucket for millennia  
‘The Phoenix kicked the bucket for millennia’

nondurative, and in part because it's telic.<sup>133</sup>) I therefore agree with McGinnis that the iterative reading is pragmatically unavailable under normal circumstances, but possible in the context of the phoenix. However, the issue is not only whether *kick the bucket* can have an iterative interpretation, but whether it can have an iterative interpretation *in the progressive*. To test this in the context of the phoenix, we should therefore look at a sentence like that in (136):

(136) [ID] \*The phoenix was kicking the bucket for millennia.

Given the surrounding discussion in McGinnis (2002), I assume that she would find (136) felicitous, but for me the idiom doesn't work in the progressive, even though an iterative context is otherwise available (as in (135a)). Idiolectal variation in the idiom's representation is to be expected; for speakers such as McGinnis, this idiom may be optionally durative, but for speakers like myself, *kick the bucket* is necessarily punctual.

Given that most of us rarely have occasion to consider the intricacies of the phoenix's life cycle, however, the judgements in (135-136) may be a bit clouded. Let us therefore bring the matter down to earth. Olsen (1997:106-7) points out that *die* can be interpreted iteratively in "stage deaths," as in (137):

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<sup>133</sup> As I discussed in section 3.3, telic predicates are impossible with durative adverbials, except under derived, multiple-event readings. Note that *die* wouldn't work here in the context of (135b), either: \**The phoenix died for three days*. Yet McGinnis seems to have a single-event interpretation in mind; she notes that for her, *The dog bit my leg for an hour* (her (21a)) has a "temporary-result" reading, where the dog bites once and won't let go. For me, it only has an iterative, multiple-events reading.

- (137) a. As Ophelia, the young actress was dying nightly.  
 b. As Ophelia, the young actress died nightly. (Olsen, *ibid.*(141))

Nonetheless, in my mind *kick the bucket* refuses to combine with the progressive in this context as well (138a), despite an iterative SIE reading being otherwise available (138b):

- (138) a. [ID] \*As Ophelia, the young actress was kicking the bucket nightly.  
 b. [ID] As Ophelia, the young actress kicked the bucket nightly.

The difference between the (a) and (b) examples in (137-138) is that in the (a) examples, we have a series of identical *durative* events, due to the contribution of the progressive. In the (b) examples, however, we have a series of identical *punctual* events. *Kick the bucket* is possible only in the latter context; it simply refuses a durative reading.

Some might find (138b) marginal, as the idiom is a bit irreverent for the Shakespearian context. Let us therefore consider the TV show *South Park*, where the character of Kenny McCormick dies (often gruesomely) in most of the early episodes, only to reappear without comment in the next one. Similarly, in the 1993 film *Groundhog Day*, the character of Phil Connors (played by Bill Murray) is trapped in a time loop, and in a sequence in the middle of the film dies several times, only to wake again unharmed. The iterative deaths in these more comedic contexts should therefore allow for an iterative interpretation of *kick the bucket*:

- (139) a. In the early episodes of *South Park*, Kenny was repeatedly dying.  
 b. [ID] \*In the early episodes of *South Park*, Kenny was repeatedly kicking the bucket.  
 c. [ID] In the early episodes of *South Park*, Kenny repeatedly kicked the bucket.
- (140) a. In a famous sequence in the film *Groundhog Day*, Phil Connors was repeatedly dying.  
 b. [ID] \*In a famous sequence in *Groundhog Day*, Phil Connors was repeatedly kicking the bucket.  
 c. [ID] ?In a famous sequence in *Groundhog Day*, Phil Connors repeatedly kicked the bucket.

To my ears, the (b) examples in (139-140), where *kick the bucket* combines with the progressive to produce an iterative series of durative events, are entirely infelicitous. The (c) examples, in which we have an iterative series of punctual events, are a good deal better. Thus it cannot be the lack of an iterative reading which prevents *kick the bucket* from appearing with the progressive.

Of course, the iterative multiple-events reading is not the only possible reading for a Semelfactive (Olsen, 1997:46-48); we can force a durative single-event reading by altering the timescale. This works for the literal *kick the bucket* (141a) as well as for *die* (141b), but fails for the idiom in (141c).

- (141) a. Slowing down the film, we see John [LIT] kicking the bucket during the first 200 milliseconds.
- b. Slowing down the film, we see John dying as he breathes his last breath.
- c. \*Slowing down the film, we see John [ID] kicking the bucket as he breathes his last breath.

For speakers who, like me, find a contrast in these examples, then even in the possible worlds where one can die iteratively, and even in sentential contexts where an iterative interpretation is otherwise available (as in 138), this idiom still refuses the progressive. *Kick the bucket* just does not work in a durative context, regardless of pragmatics.<sup>134</sup>

This is only one idiom, and the judgements in this section have been mine alone. However, the observation that the literal *kick the bucket* may appear with the progressive, but the idiom may not, is one more nail in the coffin for McGinnis's hypothesis.

#### 3.4.4 Kicking the compositionality habit

Having established that the aspectual properties of *kick the bucket* diverge from that of its literal counterpart, let's consider an idiom with similar components: *kick the habit* ('conquer one's addiction'). Under McGinnis's (2002) hypothesis, as these two idioms have the same verb, they should have identical aspectual properties: "for any idiomatic

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<sup>134</sup> The reader may note that this appears to be counter to Olsen's privative features model, as *kick the bucket* appears to be semantically specified as [-Durative]. I will return to this complication in §3.6.1-2 below.

VP with a verb  $V_n$ , there will be a nonidiomatic VP with  $V_n$  that has the same aspectual properties” (ibid.:669).<sup>135</sup> Recall that when literal *kick* combines with the progressive, it most readily yields an iterative, multiple-events interpretation. In (142a), John is kicking a bucket over and over again:

- (142) a. [LIT] John was kicking the bucket in an effort to topple it over.  
 b. [ID] \*John was kicking the bucket when we arrived.  
 c. [ID] John was kicking the habit that summer.

In (142c), we see that *kick the habit*, unlike *kick the bucket* in (142b), combines freely with the progressive. In contrast to (142a), however, the interpretation is not that of an iterative series of punctual events, but rather seems to refer to a single, drawn-out process of John beating his addiction, rather than a cycle of John getting clean, relapsing, and getting clean again.<sup>136</sup>

*Kick the habit*, then, seems to be inherently durative. Dowty’s (1979) entailment test confirms this:

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<sup>135</sup> As noted in fn. 81 above, McGinnis does not phrase this as a direct mapping only because some verbs (e.g., *get*) are ambiguous with respect to properties like agentivity. “[S]ince not all VPs with the same verb are aspectually identical, a given nonidiomatic VP with  $V_n$  may have aspectual properties different from those of an idiomatic VP with  $V_n$ ” (ibid.:669). This claim is technically unfalsifiable, as it would require ascertaining the aspectual properties of *every* VP with  $V_n$ . However, for nonambiguous verbs such as *kick*, I believe we can interpret her claim as ‘for any idiomatic VP with  $V_n$ , the nonidiomatic VP with  $V_n$  and the same other elements has the same aspectual properties’; her argument certainly seems to proceed on that basis.

<sup>136</sup> There may well be idiolectal variation here, with some speakers accepting a series-of-*durative*-events reading, but I think that most would not interpret (142c) as a series of *punctual* events.

- (143) [ID] In the fall of 1953, Miles Davis kicked the habit in a week  $\models$  Miles Davis was kicking the habit at all times during that week

The reason the idiom passes the test in (143) is because *kick the habit* is an Accomplishment. The punctual, inceptive reading where *in [time]* is interpreted as ‘after [time]’ is unavailable with Accomplishments; their durativity is semantic, not pragmatic. Thus the reading of the premise in (143) indicated in (144) fails:

- (144) [ID] \*Miles Davis kicked the habit in [after] a week [i.e, after a week had passed, he kicked the habit instantaneously].

But is *kick the habit* compositional with respect to a literal reading of its components? The literal reading is not available here; a *habit* is not a physical object that can be kicked.<sup>137</sup> We might try replacing it with *hobbit*:

- (145) The orc kicked the hobbit in ten minutes  $\not\models$  He was kicking the hobbit at all times during those ten minutes

The entailment fails in (145); *kick the hobbit* is an Achievement.<sup>138</sup> Like *kick the bucket*, then, the aspectual properties of *kick the habit* differs from those of its components (or their close equivalents). Moreover, despite both having the same verb followed by a

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<sup>137</sup> Excepting nuns’ habits, of course.

<sup>138</sup> The ambiguity typical of Achievements with *in [time]* phrases may not be apparent in (145) because the timescale disallows the ‘throughout ten minutes’ reading of *in ten minutes*. Switching it to *in ten milliseconds* would restore the ambiguity.

definite DP, these two idioms have different aspectual properties; one is a punctual Achievement and the other a durative Accomplishment. These observations are inconsistent with any model that derives the aspectual properties of these idioms from the literal readings of their phonological components.

### 3.4.5 Other “deadly” idioms

We have seen that two idioms nearly identical in form but with different meanings belong to different aspectual classes. The question remains whether the reverse is true, i.e., whether the aspectual specifications of idioms similar in their meanings can likewise vary. Consider *buy the farm* (~‘die’):

- (146) a. [ID] \*After a long illness, John was finally buying the farm.  
       b. [LIT] After saving up for years, John was finally buying the farm.

In (146a), we can see that *buy the farm*, like *kick the bucket*, refuses to combine with the progressive; this contrasts with (146b), where a literal reading of *buy the farm* accepts it. We see a similar pattern with the idiom *bite the dust* (the literal reading is a bit of a stretch here as well, so I will replace *dust* with *dog*):

- (147) a. [ID] \*After a long illness, John was finally biting the dust.  
       b. After suffering many bites himself, John was finally biting the dog.



These “deadly” idioms pattern with *kick the bucket* in being telic and nondurative. They have in common the meaning of ‘die’, but unlike the verb *die*, which is normally punctual but can gain a durative reading in the context of the progressive, these idioms appear to be only applicable to punctual deaths, rejecting durative contexts.

Not all idioms commonly paraphrased as ‘die’ follow this pattern, however. *Pass away* and *give up the ghost* seem to be semantically specified as durative; to my ears, they are at best marginal in nondurative contexts such as in (148b, 149b):

- (148) a. [ID] After a long illness, John slowly passed away.  
       b. [ID] ?John was fine one minute, but then he abruptly passed away.
- (149) a. [ID] After a long illness, John slowly gave up the ghost.  
       b. [ID] ?John was fine one minute, but then he abruptly gave up the ghost.

*Pass away* has no available literal reading, but in fantastical contexts, one can *give up* a literal ghost. In such environments, a nondurative reading is available:

- (150) [LIT] The dastardly dwarf was hiding Casper in his attic, but once the search warrant was presented, he abruptly gave up the ghost.

Thus, the idiom diverges from the literal reading of *give up the ghost*; the idiom is a durative Accomplishment, but its literal counterpart is an Achievement unspecified for durativity. Unlike *die*, which can be either punctual or durative, these idioms appear to be only applicable to durative deaths, rejecting punctual contexts entirely.

### 3.4.6 Literal compositionality: *The end of the road*

In the above I have demonstrated that it is not only Glasbey's (2003, 2007) "fake resultative" idioms that evince different aspectual properties from their literal readings; not a single one of the idioms I've considered here is aspectually identical to its literal counterpart. For example, we have seen that literal *kick* is a Semelfactive unmarked for telicity and durativity (151a). When it combines with a Theme argument, the result is a telic Achievement, still unmarked for durativity (151b). However, the idiom *kick the habit* is a durative Accomplishment (151c), and the idiom *kick the bucket* is a nondurative Achievement (151d):

- (151) a. [LIT] *kick*                    [+Dynamic]
- b. [LIT] *kick the (N)*    [+Dynamic, +Telic]
- c. [ID] *kick the habit*    [+Dynamic, +Telic, +Durative]
- d. [ID] *kick the bucket* [+Dynamic, +Telic, -Durative]

Neither (151c) nor (151d), then, have the same aspectual properties as the fully compositional (151b).

Finally, note that for a number of these idioms—in the past two sections at least *kick the habit*, *bite the dust*, and *pass away*—no literal interpretation is available at all. This is frequently because of a semantic mismatch. For example, *bite* seems to select for solid objects, which therefore require the use of the incisors; #*John bit the pudding* is thus anomalous. So although we can determine the literal reading of an idiom like *bite the*

*bullet*<sup>139</sup> and thus compare its aspectual properties with those of the idiom, it's much more difficult to do so with *bite the dust*. A similar problem is apparent for *kick the habit*, as a *habit* is not a physical object at all. As a result, comparing these idioms with a literal counterpart has required changing out the complement of the verb (*habit* → *hobbit*; *dust* → *dog*), assuming (potentially incorrectly) that nothing of consequence changes.<sup>140</sup>

A more serious problem, however, comes from idioms which differ in argument structure from their closest literal counterparts. Consider the clausal idiom *not give a damn*,<sup>141</sup> literal *give* is a ditransitive, but the idiom is not:

- (152) a. [ID/?LIT] Kira didn't give a damn.  
       b. Kira didn't give a puppy. . . [to Jadzia].  
       c. [\*ID] Kira didn't give a damn to Jadzia.  
       d. [\*ID] Kira didn't give Jadzia a damn.

Literal *give* can optionally appear without a Recipient (Levin, 1993:138), as in (152b), but when it does, that argument is simply left unspecified, and is assumed to be recoverable from the context. In (152c-d), we can see that the idiom cannot appear with a second internal argument at all; there is no “understood” Recipient here. Given that the argument structure differs for literal *give* and idiomatic *not give a damn*, McGinnis's

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<sup>139</sup> This idiom means approximately ‘do something unpleasant but necessary’.

<sup>140</sup> For example, *the dust* and *the dog* differ at least on the [+/-Count] feature, which may in certain environments have an impact on the aspectual properties of a VP containing them.

<sup>141</sup> See §1.4 here for the definition of a clausal idiom; the negation does seem to be a part of this idiom (?*Kira gives a damn*). As part of a recent idiom processing study (ms. in preparation), I asked subjects to define a number of idioms they'd just seen, including what I presented to them as *give a damn*; a majority actually defined it negatively, e.g. as ‘not care’.

(2002) hypothesis is simply untenable, as the aspectual properties of such idioms cannot be compositionally determined in the same manner as they are for the same verbs used in a literal context.

### *3.5 A return to compositionality*

In this section, I argue that the aspectual properties of idioms are compositional with respect to the components of their meanings only, and do not retain the meanings associated with the normal literal readings of their components. I then give provisional lexical representations for the idioms considered here, noting that the semantic representation of the figurative meanings of these idioms, and the syntactic information derived from those representations, are sufficient to derive the aspectual properties observed.

#### *3.5.1 The Principle of Aspectual Inertness*

Given Glasbey's (2003, 2007) arguments on the basis of idioms like *paint the town red* and *cry X's eyes out*, the differing aspectual properties of two idioms that share a verb (*kick the habit* and *kick the bucket*), and the contrasts between the figurative and literal interpretations of these and the other idioms considered, it seems clear that the aspectual properties of phrasal idioms are not compositional with respect to the normal meanings associated with their components. Are these properties fully arbitrary, then? If not, how are they determined?

Glasbey (2007:§2) notes that it is possible to conceive of aspectual composition in idioms as proceeding from a different input, and therefore yielding a different result, than in the literal equivalents. For *paint the town red*, the literal reading involves what Krifka (1992) calls the *gradual patient*<sup>142</sup> property: as the town is gradually painted, there is a corresponding gradual change of state as more and more of the town is red. No corresponding gradual patient property exists in the idiomatic eventuality; in fact, no Patient exists, as the “town” is unaffected by the activity.<sup>143</sup> Glasbey concludes that as the input to aspectual composition is different in the idiomatic and literal cases, the results therefore differ, such that the idiom is atelic and the literal phrase is telic. However, where the input is the same, the aspectual properties will be the same. Glasbey suggests two prerequisites for such a parallel:

[T]he idiomatic aspectual class corresponds to the literal aspectual class. . . where (a) counterparts exist in the domain of idiomatic interpretation to the objects in the domain of literal interpretation, and (b). . . the thematic relations between those objects and the eventuality are the same in the literal and the idiomatic cases. (Glasbey, *ibid.*:9).

These prerequisites should be familiar from §2.2.6 above, where I discuss Horn’s (2003) proposal that the property of *thematic composition* is a prerequisite for an idiom to be syntactically mobile. For Horn, an idiom has thematic composition if “the thematic

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<sup>142</sup> See also Dowty’s (1991) *incremental theme*.

<sup>143</sup> In fact, no urban center is necessarily presupposed. See fn. 126 above, as well as Glasbey (2007:fn. 8).

structure of the verb in its literal sense and that of the verb in its idiomatic sense are identical,” with the definition of *thematic structure* as “the set of semantic roles that a verb assigns to its NP arguments” (ibid.:249).

In Chapter 2, I proposed a synthesis of Horn’s notion of thematic composition and Newmeyer’s (1974) model, in which the semantic representation of an idiom under its figurative reading, or its  $M_1$ , and its semantic representation under a literal reading, or its  $M_2$ , must both govern a transformation in question in order for it to felicitously apply to the idiom. Under this synthesis, the  $M_1$  and  $M_2$  of an idiom must be equivalent in terms of both the verb and the theta roles involved in order for the idiom to be syntactically mobile.<sup>144</sup> By *equivalent* here, I mean that they must share the structural components of their meanings, in the sense of Rappaport Hovav and Levin (1998): the *structural component* of a verb’s meaning is that part which is “grammatically relevant. . . to determining the semantic classes of verbs whose members share syntactically- and morphologically-salient properties” (ibid.:105).<sup>145</sup>

Adapting this account to the question of aspectual composition, then, we can say that a phrasal idiom will have the same aspectual properties as its literal counterpart *if and only if* the verbal element in both belongs to the same semantic class (in the sense of Levin, 1993), therefore sharing the same structural components of meaning and assigning the same theta roles. We may formalize this as in (153):

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<sup>144</sup> As noted in §2.2.6, such idioms correspond to Nunberg et al.’s idiomatically combining expressions; specifically, those which Nunberg (1978) labelled as “normally” decomposable.

<sup>145</sup> See § 3.4.1 above.

- (153) *Thesis of Aspectual Correspondence (THAC0)*: A phrasal idiom will have the same aspectual properties as the literal interpretation of its phonological components *if and only if* the  $M_1$  and  $M_2$  associated with the idiom share the same structural components of meaning.

Of course, this is just another way of saying that the  $M_2$  of an idiom may happen to coincide with the idiom's  $M_1$ ,<sup>146</sup> and if it does, they will share the same aspectual properties. This is true of *any* pair of predicates; this is the reason *wipe* and *sweep* share the same aspectual properties. The formalization in (153) is thus an indirect way of saying that the aspectual properties of an idiom are part of its semantic representation, compositionally determined only to the extent to which the meaning of the idiom is compositionally determined.

In this model, a nondurative idiom like *bite the dust* has two components: one is the component 'die', and the other is a component meaning 'nonduratively' or 'punctually'. These components predict the aspectual composition which the idioms can undergo, which is why *bite the dust* cannot appear with the progressive; it is semantically specified as nondurative. To the extent to which this 'nondurative' feature is considered a separate component from 'die', then the idiom is compositional after all, but only with respect to its internal conceptual structure. In other words, it is *lexically* compositional.

On the basis of the evidence I've considered in this chapter, then, I conclude that any constraints on aspectual interpretation (e.g., that a given idiom may not appear in durative contexts) are due to the inherent conceptual structure of the idiom, not any

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<sup>146</sup> Whether this occurs because of diachronic transmission from the original metaphorical use of the words involved, or because of pure happenstance, is immaterial here.

properties that the same phonological forms might have under a literal interpretation. I therefore reformulate (153) as follows:

- (154) *Principle of Aspectual Inertness (PAI): Only the intended conceptual structure of a predicate is relevant to the computation and interpretation of inner aspect; other conceptual structures associated with the same phonological forms are aspectually inert in the context of language production.*

The Principle of Aspectual Inertness is merely a special case of the Principle of Semantic Inertness, which I posited in the previous chapter ((86), repeated here as (155)):

- (155) *Principle of Semantic Inertness (PSI): Only the intended conceptual structure of a predicate is relevant to the computational and interpretive component of the grammar; other conceptual structures associated with the same phonological forms are semantically inert in the context of language production.*

I will also repeat my elaboration of the PSI, in the context of the special case of the PAI. First, I make no reference to idioms or figurative language here; rather, I claim that the PAI is applicable to all predicates. For example, when I say *The carpenter*



*screwed the drywall to the stud*, the myriad of other senses of *screw*<sup>147</sup> simply do not enter into the computation of aspect, as they all have different conceptual structures. The intended sense is transitive (or ditransitive), with at least one internal theta role to assign;<sup>148</sup> the obscene sense of *screw* ('copulate'), on the other hand, is optionally intransitive, as in *The mailman likes to screw*. Similarly, if I say *A student of mine was screwing around*, the only aspectual properties that are relevant to the computation and interpretation of the aspectual properties of this sentence are those associated with my intended meaning of *screw around* ('engage in idle activity'<sup>149</sup>), an inherently durative event; this precludes *\*He screwed around at noon*. Aspectual properties associated with the same phonological forms under other interpretations simply do not enter into the computation.<sup>150</sup>

Second, note in my formulation of the PAI "the intended conceptual structure" and "in the context of language production." From a comprehension perspective, an idiom may be ambiguous between the literal and figurative interpretations, and in certain contexts both interpretations are actively in competition. For example, for the sentence *The old rancher bought the farm*, either a literal or figurative interpretation is plausible, and the listener may consider both possibilities in the process of comprehension, along with the aspectual interpretations associated with the two predicates. In the mind of the *speaker*, however, no such ambiguity exists; either one or the other predicate is intended.

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<sup>147</sup> In addition to those mentioned in the main text here, Wiktionary lists 'to cheat', 'to apply pressure', 'to contort [one's face]', 'to extort', and 'to miskick [in soccer]'.

<sup>148</sup> Levin (1993) writes of this class of verbs that "[w]hen they do not take a prepositional phrase complement, they need a collective NP as object."

<sup>149</sup> This is just a first pass at an operative paraphrase; one would have to investigate further.

<sup>150</sup> The same can be said for the other *screw around* ('copulate promiscuously'), which may actually be compositional with respect to *screw* ('copulate') and the sense of *around* meaning 'in multiple locales/situations'.

The aspectual properties of the idioms I’ve considered in this chapter are in Table 4. Positively marked features are indicated with a “+” and negatively marked features are indicated with a “-”; unspecified features are blank. Note that in all cases, the idioms take on the aspectual properties of their M<sub>1</sub>, and in none do we see the M<sub>2</sub> literal reading playing any apparent role in aspectual composition. (I indicate the correspondence of the idiom and its M<sub>1</sub> with light shading, and the differing M<sub>2</sub> with dark shading.)

*Table 4: Aspectual specifications of some phrasal idioms, their M<sub>1</sub>s, and their M<sub>2</sub>s*

Idiom	Telic	Durative	Idiom	Telic	Durative
<i>Paint the town red</i>		+	<i>Cry X’s eyes out</i>		+
M <sub>1</sub> : ‘revel’		+	M <sub>1</sub> : ‘cry’ ‘intensely’		+
M <sub>2</sub> : [LIT] ‘paint the town red’	+	+	M <sub>2</sub> : [LIT] ?‘cry X’s eyes out’	+	+
<i>Kick the bucket</i>	+	-	<i>Kick the habit</i>	+	+
M <sub>1</sub> : ‘die’ ‘punctually’	+	-	M <sub>1</sub> : ‘conquer X’s addiction’	+	+
M <sub>2</sub> : [LIT] ‘kick the bucket’	+		M <sub>2</sub> : [LIT] ‘kick the <del>habit</del> /hobbit’	+	
<i>Bite the dust</i>	+	-	<i>Pass away</i>	+	+
M <sub>1</sub> : ‘die’ ‘punctually’	+	-	M <sub>1</sub> : ‘die’ ‘duratively’	+	+
M <sub>2</sub> : [LIT] ‘bite the <del>dust</del> /dog’	+		M <sub>2</sub> : [LIT] *‘pass away’	n.a.	n.a.
<i>Buy the farm</i>	+	-	<i>Give up the ghost</i>	+	+
M <sub>1</sub> : ‘die’ ‘punctually’	+	-	M <sub>1</sub> : ‘die’ ‘duratively’	+	+
M <sub>2</sub> : [LIT] ‘buy the farm’	+		M <sub>2</sub> : [LIT] ‘give up the ghost’	+	

The conclusion that these idioms are compositional after all, but only with respect to the components of their *meanings*, is to be expected, I think, under any truth-conditional theory of meaning. After all, *John kicked the bucket* is true in a world where

John died and false in a world where he is still alive. From a strictly semantic point of view, no bucket is involved, and nobody has kicked anything. On an *a priori* basis, then, the meaning of *kick* (i.e., ‘kick’) should not enter into the computation of the meaning of the phrase.

Yet this view is persistent. In addition to Marantz (1997) and McGinnis’s (2002, 2005) advocating this position, it is assumed quite widely, often with little to no evidence adduced. For example, Nunberg (1978:214-15) writes that:

[S]peakers must make some assumptions about the rationale whereby kick the bucket is used to refer to dying; in particular, that kick is the same word that is used to refer to the act of striking with the foot, and that the best function from this takes us to an abrupt act, rather than to a gradual act. . .

Extending this conjecture, Nunberg, Sag, and Wasow (1994:fn. 12) claim that:

*[K]ick the bucket* cannot be used to refer to a protracted death, as in ??*She has been kicking the bucket for the last six months*. Presumably, this reflects an assumption that whatever the scenario that might license this metaphor, **the punctuality of *kick* would have to be preserved in the idiomatic interpretation.** [Emphasis added]

Along similar lines, Titone and Connine (1999:1662) write that:

*John kicked the bucket in the car accident* is a more plausible statement than is *John lay kicking the bucket due to his chronic illness*. . . **the verb *kick* denotes a sudden action, therefore, its participation in a phrase that overall refers to a sudden event is more plausible** than a phrase that overall refers to an event that unfolds over time. [Emphasis added]

More recently, Espinal and Mateu (2010:1409) note that:

[E]ven prototypical IPs<sup>151</sup> like *kick the bucket* can be shown to have some portions of compositional meaning: for example. . . **the punctual/sudden meaning of *kick* is preserved in the idiom *kick the bucket***. . . [Emphasis added]

We have seen here, however, that literal *kick* can co-occur with the progressive, either with an iterative interpretation (*John's horse was kicking; John had been kicking the ball around for hours*), or even a durative, single-event interpretation (*Slowing down the film, we can see the horse as he was kicking; it was just one kick, but it killed that man*). The punctuality of *kick* is therefore merely a pragmatic implicature, whereas the punctuality of *kick the bucket* is semantic, and cannot be cancelled. It is punctual because its meaning is punctual; it is composed of the elements 'die' and 'punctually'.

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<sup>151</sup> *Idiomatic phrases*, as opposed to *idiomatically combining expressions*; see Nunberg, Sag, & Wasow (1994), as well as §2.2.5 here and fn. 129 above.

How this arose, of course, is a question for diachronic linguistics. It may well be that the pragmatic implicature whereby *kick* is normally interpreted punctually may have influenced why *kick the bucket* came to be used to refer to a punctual death. From a synchronic perspective, however, this is irrelevant to the computation of aspect in a sentence which contains this idiom; only the inherent semantics of the idiom are relevant in this domain.<sup>152</sup>

### 3.5.2 Lexical representations of idioms

As we have seen, although *kick the bucket* is commonly paraphrased simply as ‘die’, there are aspects of its structural meaning not included in this paraphrase. *Kick the bucket* and *die* are not identical in terms of their aspectual properties; in durative contexts, there is a clear contrast. This is true whether the durativity is contributed by the progressive (156a-b), or by a durative adverbial such as *slowly* (157a-b).

- (156) a. After a long illness, John was dying.  
       b. [ID] \*After a long illness, John was kicking the bucket.
- (157) a. After a long illness, John slowly died.  
       b. [ID] \*After a long illness, John slowly kicked the bucket.

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<sup>152</sup> Of course, it is possible that ontogeny recapitulates phylogeny here; the process of acquiring the aspectual properties of the idiom could plausibly mirror the development of the idiom over time. For example, there may have been a time when the idiom *kick the bucket*, like its literal counterpart, *could* appear in the progressive, and that a learner might first construct a representation for the idiom in which its durativity is unspecified, only later adjusting it so that the idiom is only used for punctual deaths. That would be an empirical question (suited to a collaboration between a researcher on L1/L2 acquisition and an etymologist) well beyond the scope of this dissertation.

If *kick the bucket* meant simply ‘die’, we would have no explanation for these contrasts. Our conclusion, then, must be that *kick the bucket* means something more specific than ‘die’. It refers to the punctual component of death only, and cannot refer to its preliminary stages. A more accurate paraphrase would be ‘die punctually’, and in fact it shares this more specific meaning with *buy the farm* and *bite the dust*.<sup>153</sup> The meanings of these idioms have two components: ‘die’ and ‘punctually’, and these components predict the aspectual composition which the idioms can undergo.

Building on the lexical representations introduced in §2.3.1, I represent *kick the bucket* provisionally as follows, where  $M_1$  indicates the idiom’s meaning, PF indicates its phonological form, and SYN refers to syntactic information. The first component is lexically specified as telic and dynamic, and the second as nondurative:

(158)  $M_1$ : ‘die’<sub>[TELIC, DYNAMIC]</sub> [EXPERIENCER]

‘punctually’<sub>[NONDURATIVE]</sub>

PF: *kick the bucket*

SYN: Verb [\_\_PROTO-PATIENT]

Compare the representation for *die* in (159); *die* has no ‘punctually’ component, as it can appear in durative contexts:

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<sup>153</sup> Whether the meanings of these idioms differ with respect to other details I leave open, but I believe they are interchangeable in the aspectual contexts considered here.

(159) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub> [EXPERIENCER]

PF: *die*

SYN: Verb [\_\_PROTO-PATIENT]

Except for the PF involved, the lexical representations for *bite the dust* and *buy the farm* will be the same as for *kick the bucket*:

(160) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub> [EXPERIENCER]

‘punctually’<sub>[NONDURATIVE]</sub>

PF: *buy the farm*

SYN: Verb [\_\_PROTO-PATIENT]

(161) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub> [EXPERIENCER]

‘punctually’<sub>[NONDURATIVE]</sub>

PF: *bite the dust*

SYN: Verb [\_\_PROTO-PATIENT]

For idioms like *pass away* and *give up the ghost*, the difference is that instead of a ‘punctually’ component, we have a ‘duratively’ component:

(162) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub> [EXPERIENCER]

‘duratively’<sub>[DURATIVE]</sub><sup>154</sup>

PF: *give up the ghost*

SYN: Verb [\_\_PROTO-PATIENT]

(163) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub> [EXPERIENCER]

‘duratively’<sub>[DURATIVE]</sub>

PF: *pass away*

SYN: Verb [\_\_PROTO-PATIENT]

The lexical representations in (158-163) provide sufficient information to derive not only the syntactic mobility of these predicates, as discussed in Chapter 2, but also their aspectual behavior. Moreover, no information concerning the M<sub>2</sub> literal counterpart of an idiom is necessary to derive the observed properties; this is consistent with PSI and PAI (154-155) above. Finally, as this information is part of the inherent semantics of these predicates, it must be in some capacity deducible from the input during the process of acquisition, otherwise we would be unable to interpret these idioms at all. But since the syntax corresponds directly to the semantics here, acquiring the semantics gives us the syntax “for free”; to know what one of these idioms means is to know how to use it.

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<sup>154</sup> It may seem redundant to assign a feature to a paraphrase of that feature. However, I think it makes for a clearer presentation, as one can clearly see that *give up the ghost* is lexically compositional in that its cluster of aspectual features are composed of the two features for ‘die’ and the one feature of this component.



### *3.6 Towards a syntactic implementation of monotonic composition*

In this section, I consider how to incorporate idioms into Olsen's privative features model, arguing that although verbs cannot be lexically specified as (e.g.) nondurative or atelic, phrasal idioms *can* be, precisely because they lexicalize a larger piece of structure. I propose that the lexical representations of idioms may therefore include an inner aspect projection AspP in addition to a verbal projection (with AspP dominating VP and dominated by vP, as in MacDonald, 2008b), with the result that they may be semantically durative or nondurative and telic or atelic, whereas verbs are restricted to either the positive value or to being lexically unspecified for these features. Finally, I briefly speculate on the nature of the aspect head Asp<sup>0</sup>, and conclude.

#### *3.6.1 Idioms in a privative features model*

Although her model is not especially well known in the field, Olsen (1997) builds a strong case in her monograph that durativity, telicity, and dynamicity are semantic features inherent to the lexical aspect of verbs, but that punctual, atelic, and stative interpretations arise either from 1) pragmatic implicatures resulting from verbs being unspecified for these features, or 2) the monotonic semantic contributions of other sentential and contextual elements. The evidence for this is an asymmetry in which durativity, telicity, and dynamicity form homogeneous classes that are not subject to aspectual shift, but punctuality, atelicity, and stativity are cancellable in felicitous contexts.

Applying the features tests of Vendler (1967), Dowty (1979), Smith (1991), Olsen (1997), and MacDonald (2008a-b) in §3.4, however, has demonstrated that at least some idioms seem to represent an exception to this system. The meanings of *kick the bucket*, *buy the farm*, and *bite the dust*, for example, include a nondurative structural component, as these idioms cannot appear with durative elements. Unlike other predicates, then, these idioms seem to be marked negatively for some of these aspectual features.

Two possible conclusions can be drawn from this. The first would be that Olsen's system is fatally flawed, as the data tells us that a negatively marked feature like nondurativity can in fact be lexicalized as part of the inherent aspect of a predicate. We might then consider discarding the privative features system entirely (and monotonicity with it). However, Olsen's generalization seems to hold for nonidiomatic verbs, some of which may be pragmatically implicated to be punctual, atelic, and stative, but can nonetheless appear in durative, telic, and dynamic contexts (respectively). Indeed, the evidence so far is that for predicates, semantic nondurativity and, in particular, incompatibility with the progressive, is limited to phrasal idioms, and is not a property of any individual verb. Thus it appears that idiomaticity is what constitutes the exception.

If we are otherwise convinced by Olsen's arguments with respect to nonidiomatic verbs, we must then consider the second possible conclusion: phrasal idioms are exceptional in that they may lexicalize more components of meaning than is possible with verbs. Under this view, the inherent aspect of a verb is limited to the privative features available to a verbal head, but phrasal idioms may inherently lexicalize *inner* aspect, which may include negatively marked features. In the next section, I consider how this lexicalization of semantic features might be reflected in the syntactic component.

### 3.6.2 The inner aspect of idioms: A possible syntactic implementation

As the verbal components of phrasal idioms can lexically specify their complements (e.g., with *spill* / ‘reveal’ specifying that its complement is *the beans* / ‘the secret’), I have been assuming that they occupy only the level of VP. Phrasal and clausal idioms<sup>155</sup> such as *the die is cast* and *you can’t unring a bell* can include functional structure above the level of VP, however, and perhaps phrasal idioms can as well. Perhaps, then, these idioms occupy not only a verbal projection in the syntax, but also an inner aspect projection, AspP, which dominates VP. This would allow us to capture the observation that individual verbs (which head only verbal projections) host only positively marked features, but that idioms may host negatively marked features, as they may additionally include this aspectual projection.

It is not my intention to put forward a full proposal here concerning the syntax of inner aspect; I will address this in slightly greater detail in the context of lexical insertion in Chapter 4, but I refer the reader to such works as MacDonald (2008b) and Travis (2010) for in-depth considerations of the syntax of inner aspect.<sup>156</sup> For now, I would merely like to speculate on what a system of monotonic aspectual composition with these properties might look like syntactically. For the sake of exposition, therefore, I will assume a single functional projection AspP, selected for by  $v^0$  and headed by a (phonologically null) head  $Asp^0$  which hosts the features [TELICITY], [DYNAMICITY], and [DURATIVITY]. Under the further assumption that  $Asp^0$  can specify any of the three

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<sup>155</sup> See §1.4 above.

<sup>156</sup> MacDonald and Travis’s models both involve an inner aspect projection between vP and VP, as in the simplified proposal apparent here; in Travis’s model, which to some extent is a syntactic implementation of Pustejovsky (1991) (see fns. 97 and 115 above), an Event projection exists above vP as well. For MacDonald, only events have an AspP; states lack this projection, with *v* selecting VP directly.

features as either positive or negative, inner aspect heads would come in eight possible flavors, corresponding to the eight possible aspectual classes (two of which are for principled reasons unattested; see fn. 113 above, as well as Olsen, 1997:50-53):

(164) Accomplishment:	$\text{Asp}^0_{[\text{TELIC, DYNAMIC, DURATIVE}]}$
Achievement:	$\text{Asp}^0_{[\text{TELIC, DYNAMIC, NONDURATIVE}]}$
Stage-level State:	$\text{Asp}^0_{[\text{TELIC, NONDYNAMIC, DURATIVE}]}$
[unattested]	$*\text{Asp}^0_{[\text{TELIC, NONDYNAMIC, NONDURATIVE}]}$
Activity:	$\text{Asp}^0_{[\text{ATELIC, DYNAMIC, DURATIVE}]}$
Semelfactive:	$\text{Asp}^0_{[\text{ATELIC, DYNAMIC, NONDURATIVE}]}$
State:	$\text{Asp}^0_{[\text{ATELIC, NONDYNAMIC, DURATIVE}]}$
[unattested]	$*\text{Asp}^0_{[\text{ATELIC, NONDYNAMIC, NONDURATIVE}]}$

Thus the components of the Achievement idioms *kick the bucket*, *buy the farm*, and *bite the dust* glossed as ‘punctually’ are reflected in the syntax as the phonologically null aspect head  $\text{Asp}^0_{[\text{TELIC, DYNAMIC, NONDURATIVE}]}$  (which I abbreviate as  $\text{Asp}^0_{[\text{TEL, DYN, NDUR}]}$ ):

- (165)  $M_1$ : ‘die’<sub>[TELIC, DYNAMIC]</sub> ‘punctually’<sub>[NONDURATIVE]</sub> [EXPERIENCER]  
 PF: *kick the bucket / bite the dust / buy the farm*  
 SYN:  $\text{Asp}^0_{[\text{TEL, DYN, NDUR}]}$  Verb [\_\_PROTO-PATIENT]

*Give up the ghost* and other durative Accomplishment idioms are lexicalized with a different aspect head,  $\text{Asp}^0_{[\text{TEL}, \text{DYN}, \text{DUR}]}$ :

(166)  $M_1$ : ‘die’<sub>[TELIC, DYNAMIC]</sub> ‘duratively’<sub>[DURATIVE]</sub> [EXPERIENCER]

PF: *give up the ghost* / *pass away*

SYN:  $\text{Asp}^0_{[\text{TEL}, \text{DYN}, \text{DUR}]}$  Verb [\_\_PROTO-PATIENT]

*Die*, however, has no lexically specified inner aspect head, so its only aspectual specifications regard telicity and dynamicity:

(167)  $M_1$ : ‘die’<sub>[TELIC, DYNAMIC]</sub> [EXPERIENCER]

PF: *die*

SYN: Verb [\_\_PROTO-PATIENT]

The co-occurrence restrictions on different predicates can be accounted for as follows. *Die* can appear in a sentence along with either  $\text{Asp}^0_{[\text{TEL}, \text{DYN}, \text{DUR}]}$  or  $\text{Asp}^0_{[\text{TEL}, \text{DYN}, \text{NDUR}]}$ , as both are compatible with its inherent aspect of [TEL, DYN]; these two choices will correspond to its durative and punctual readings, respectively. For example, when *die* co-occurs with a punctual modifier like *at noon*, it will be introduced along with  $\text{Asp}^0_{[\text{TEL}, \text{DYN}, \text{NDUR}]}$ , as in (168a-b). For *die* to co-occur with the progressive and/or a durative

modifier like *slowly*, however, it must be introduced along with  $\text{Asp}^0_{[\text{TEL}, \text{DYN}, \text{DUR}]}$ , as in (168c-d) ( $\text{Asp}^0$  and relevant features boldfaced and underlined)<sup>157</sup>:

(168) a. John died at noon.

b.  $[\text{TP} [\text{DP } \textit{John}] [\text{T}\emptyset] [\text{vP} [\text{v}\emptyset] [\text{AspP} [\text{Asp}\emptyset_{[\text{TEL}, \text{DYN}, \textbf{\underline{NDUR}}]}] [\text{VP} [\text{v } \textit{died}_{[\text{TEL}, \text{DYN}]]}]$   
 $[\text{PP} [\text{P } \textit{at}_{[\textbf{\underline{NDUR}}]}] [\text{DP } \textit{noon}]]]]]$

c. John was slowly dying.

d.  $[\text{TP} [\text{DP } \textit{John}] [\text{T}\emptyset] [\text{ProgP} [\text{Prog } \textit{was}_{[\textbf{\underline{DUR}}]}] [\text{vP} [\text{v}\emptyset] [\text{AspP} [\text{Asp}\emptyset_{[\text{TEL}, \text{DYN}, \textbf{\underline{DUR}}]}]$   
 $[\text{VP} [\text{AdvP} [\text{Adv } \textit{slowly}_{[\textbf{\underline{DUR}}]}]] [\text{v } \textit{dying}_{[\text{TEL}, \text{DYN}]]]]]]]$

If an inner aspect head is incompatible with the features of another element, however, the derivation will fail to converge (conflicting features boldfaced and underlined):

(169) a. John was slowly dying.

b.  $*[\text{TP} [\text{DP } \textit{John}] [\text{T}\emptyset] [\text{ProgP} [\text{Prog } \textit{was}_{[\textbf{\underline{DUR}}]}] [\text{vP} [\text{v}\emptyset] [\text{AspP} [\text{Asp}\emptyset_{[\text{TEL}, \text{DYN}, \textbf{\underline{NDUR}}]}]$   
 $[\text{VP} [\text{AdvP} [\text{Adv } \textit{slowly}_{[\textbf{\underline{DUR}}]}]] [\text{v } \textit{dying}_{[\text{TEL}, \text{DYN}]]]]]]]$

c.  $*[\text{TP} [\text{DP } \textit{John}] [\text{T}\emptyset] [\text{ProgP} [\text{Prog } \textit{was}_{[\text{DUR}]}] [\text{vP} [\text{v}\emptyset] [\text{AspP} [\text{Asp}\emptyset_{[\textbf{\underline{ATEL}}, \text{DYN}, \text{DUR}]}]$   
 $[\text{VP} [\text{AdvP} [\text{Adv } \textit{slowly}_{[\text{DUR}]}]] [\text{v } \textit{dying}_{[\textbf{\underline{TEL}}, \text{DYN}]]]]]]]$

The nondurative  $\text{Asp}^0$  in (169b) is compatible with *die*, but incompatible with the progressive and with *slowly*, both of which are [+Durative]. In (169c), the atelic  $\text{Asp}^0$  is

<sup>157</sup> I assume here that both *slowly* and *at [time]* adverbials are adjoined to VP; they could conceivably be adjoined to AspP or vP, but this is not relevant for present purposes. I assume also that the progressive heads an independent projection above vP, which I label here as ProgP.

incompatible with [+Telic] *die*. Thus the only Asp<sup>0</sup> compatible with *at noon* must be both [+Telic] and [-Durative], as in (168a-b), and the only one compatible with *was dying* must be both [+Telic] and [+Durative], as in (168c-d).

Again, this has just been a sketch of the kind of system that would allow us to capture the observed facts about idioms in a privative features model of inner aspect; I leave it to future research to consider alternatives. However implemented, I believe that the hypothesis that idioms lexicalize a greater degree of structure than do verbs is quite promising in its implications, as it allows us to incorporate the observations about the highly specified aspectual properties of idioms presented in this chapter into a monotonic system of aspectual composition.

### 3.7 Conclusion

In this chapter, I have demonstrated that any model that derives the aspectual properties of idioms from the normal meanings of their components under a literal reading is inconsistent with the data, and is therefore simply untenable. On the contrary, I have shown that these properties instead are derivable from the semantic representation of the idiom, a precisely parallel result to that achieved in Chapter 2, where I demonstrated that the semantic representation of an idiom determines its syntactic mobility. In incorporating these properties into a monotonic system of aspectual composition, I have proposed also that phrasal idioms differ from verbs in that they may lexicalize a greater degree of structure, including the inner aspect projection AspP, with the result that they

may be semantically durative or nondurative and telic or atelic, whereas verbs are restricted to either the positive value or to being lexically unspecified for these features.

I will just note in conclusion that these observations about the central role of the  $M_1$  meaning of an idiom in determining its aspectual properties accord nicely with the current biolinguistic perspective. In this view, phonological form is seen as a phenomenon of externalization, imposed by the interface with the sensorimotor system (SMS), and irrelevant to the computational and interpretive modules of the grammar. As I mentioned in Chapter 1, Berwick & Chomsky (2016:40) speak of the SMS as “like the printer attached to a computer, rather than the computer’s CPU.”

In Chapter 4, I will develop a model of lexical insertion consistent with this perspective, whereby the phonological forms associated with a lexical item are inserted postsyntactically into already-generated structures. In this model, idiomaticity will be reconstrued as a phenomenon of externalization, with the only salient difference between idioms and “literal” forms being that idioms may be inserted *en bloc* into multiple nodes.

Along these lines, I will sum up by noting that the phonological form of an idiom is, from a certain perspective, like the handle on a bucket; it’s merely a convenient way to grasp it. It’s the *meaning* of the idiom, and the syntactic information derived from this meaning, that are important to the computational and interpretive components of the grammar. For these systems, the phonological handle is irrelevant; it’s what’s *in* the bucket that counts.



## CHAPTER 4: THE LEXICAL INTERFACE(S)

### 4.1 Overview

This chapter will be concerned with the syntax-lexicon interface, and whether it should be considered to be a single interface, or instead *a pair* of interfaces: one where the semantic properties of lexical items are inserted, and one where their phonological properties are inserted. Jackendoff (1997b) refers to the syntax-lexicon interface simply as the *lexical interface*, defining it as “the means by which lexical entries find their way into sentences” (ibid.:83); this chapter will be concerned with the same question.

Building on the conclusions of Chapters 2 and 3, in which the  $M_1$  semantic representation of an idiom determines both its thematic structure (and therefore its syntactic mobility) and its aspectual features (and therefore its aspectual co-occurrence restrictions), I consider here what such conclusions can tell us about the syntax-lexicon interface(s). In the end, I will argue that the constraints on the syntactic mobility of a lexical item, as well as the constraints on the elements with which it can co-occur, are better thought of as constraints on the *insertion* of that lexical item; more precisely, on the insertion of the phonological form of that item.

Under this view, the structures into which phonological forms can be inserted are composed of abstract morphemes with syntactic and semantic features, as in early versions of Distributed Morphology (Halle & Marantz, 1993), and as in the psycholinguistically-grounded model of Pfau (2009). I refer to these abstract morphemes

as *Roots*, or, where confusion might result, as *Roots-as-nodes* (*N-Roots*), following Acquaviva's (2008) distinction. These are the elements that are chosen from the lexicon at Numeration (Chomsky, 1995) to form the lexical array from which a sentence is constructed, here by recursive applications of Merge;<sup>158</sup> I refer to this procedure as *Root Insertion* (*R-Insertion*). These are also the elements which, once processed by the computational component, form the input to the interpretive component.

From a brain-internal perspective, this is all that is strictly necessary; we have primitive concepts on which a syntactic computation is performed, allowing for a compositional semantics in which the intended relationships between those concepts is structurally instantiated. However, language has an external applicability, as well, and for this, we need phonological forms. These forms are exponents of the abstract morphemes involved in computation, and can be freely selected, as long as the set of features of the exponent(s) is nondistinct from the set of features of the abstract morpheme(s).<sup>159</sup> I refer to these forms here as *phonological forms* (*PFs*), *phonological exponents*, or *Roots-as exponents* (*E-Roots*). The process by which these exponents are inserted into a structure I will refer to as Phonological Insertion (*P-Insertion*).

Given the joint conclusions of Chapters 2 and 3 that the  $M_1$  semantic representation of an idiom determines both its syntactic mobility and its aspectual co-occurrence restrictions, the advantages of this model, in which abstract Roots are the input to the syntax and the basis for feature mapping at P-Insertion, should be apparent. It

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<sup>158</sup> In Chapter 5, I will argue for an isomorphic version of Merge I term *Branch*.

<sup>159</sup> This free selection is consistent with the first part of Halle's (1997:128) Subset Principle, but not the second, which involves a deterministic process in which the exponent with the greatest number of matching features is automatically chosen. Although this may be true for functional morphemes (e.g., *the*), I assume that it is not true for lexical morphemes (e.g., *cat*). See §4.3.2 below.

will allow us to capture the observation that these restrictions are identical for a given idiom and for a (fully elaborated) “literal” paraphrase of its  $M_1$  by asserting that the two syntactic derivations are isomorphic, building identical structures and only diverging at the point of P-Insertion. As the abstract structures that are constructed are identical both for an idiom and for the paraphrase of its  $M_1$ , the input to the interpretive component will be identical, with the result that sentences like (170a-b) will be defined by the same truth conditions, but that both will have different truth conditions from (170c):

- (170) a. [ID] John suddenly bought the farm last night.  
       b. John suddenly died last night.  
       c. [LIT] John suddenly bought the farm last night.

This chapter is organized as follows. In §4.2, I survey the development of the notion of lexical insertion in the generative tradition, beginning with Chomsky (1957) and the *Aspects* model (Chomsky, 1965), including a detour through generative semantics, and continuing with issues surrounding lexical insertion in the Standard and Extended Standard Theories, the Government and Binding era, and the radical reinterpretation of the grammar apparent in the Minimalist Program (Chomsky, 1993, 1995, etc.). Next, I review in §4.3 some of the varying views of lexical insertion in Distributed Morphology, the most prominent model that separates what I refer to here as Root Insertion and Phonological Insertion. Along the way, I focus closely on Embick’s (2000) arguments for a return to early insertion and Haugen and Siddiqi’s alternate analysis of the relevant facts, and on Harley’s (2014) arguments that Roots are not

semantically individuated in the syntax. I provide extended original counterarguments to the latter claim, and settle instead on a view of the grammar similar to that of Pfau (2009), considering also psycholinguistic evidence suggesting that 1) Roots-as-nodes are semantically individuated, contra Harley, and 2) phonological insertion is postsyntactic, contra Embick.

In §4.4, I return to the question of how to account for constraints on the insertion of idioms into syntactic structures, arguing that idiomaticity is a property of the second lexical interface only; idioms differ from literal language only with respect to feature-mapping between the semantic properties of morphemes that have been processed by the syntax (N-Roots), and the semantic features that are connected to their phonological forms (E-Roots). In doing so, I illustrate how the observed constraints on the insertion of idioms fall out directly from the semantic representations of the N-Roots which they realize phonologically. Section 4.5 concludes.

#### *4.2 Lexical insertion in generative models of the grammar*

In this section, I review some of the historical development of the notion of lexical insertion in the generative tradition, beginning with Chomsky (1957, 1965), continuing with the short-lived alternative known as generative semantics, and then looking at some of the issues surrounding lexical insertion in the Standard and Extended Standard Theories, the Government and Binding era, and in the currently ascendant paradigm known as the Minimalist Program (Chomsky 1993, 1995, etc.).

#### 4.2.1 Syntactic Structures; Aspects of the Theory of Syntax

In *Syntactic Structures* (Chomsky, 1957), few words are dedicated to the subject of lexical insertion. Instead, lexical items are introduced into a structure via rewrite rules, in the same manner as a sentence or a VP is expanded into its constituents:

- (171) a. Sentence  $\rightarrow$  NP + VP  
       b. VP  $\rightarrow$  Verb + NP  
       c. N  $\rightarrow$  man, ball, etc.  
       d. Verb  $\rightarrow$  hit, took, etc. (Chomsky, 1957(13i,iii,v,vi))

No “lexical insertion” is apparent here; rather, rules like (171c-d) simply list possible items that nouns and verbs can be rewritten as. The nature of this list is left open.

In *Aspects of the Theory of Syntax* (Chomsky, 1965), lexical items are for the first time located in the *lexicon*, an independent system consisting of an unordered list of pairs  $(D,C)$  of phonological ( $D$ ) and syntactic ( $C$ ) feature bundles.<sup>160</sup> In a lexical entry  $(D,C)$ ,  $D$  represents “a phonological[ly] distinctive feature matrix ‘spelling’ a certain lexical formative,” and  $C$  represents a *complex symbol*, or a “collection of specified syntactic features” (ibid.:84).

In the first stage of a derivation, the phrase structure rules (i.e., the rewrite rules) generate structures whose terminal points consist of complex symbols, or clusters of

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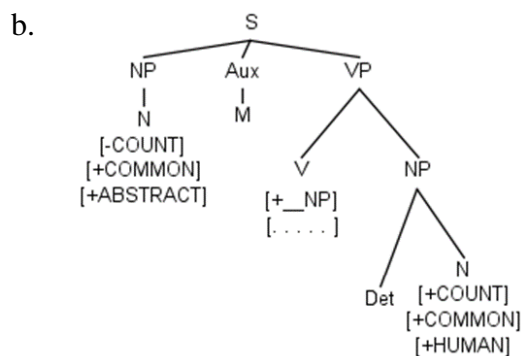
<sup>160</sup> Chomsky notes (fn. 15) that lexical entries must also contain semantic information, which one might also be able to represent as a set of features; he does not pursue this possibility, however.

syntactic features.<sup>161</sup> Chomsky refers to the structures produced in this way as *preterminal strings*. The phonological forms are then inserted into the preterminal strings via a *lexical rule*, which is considered to be a type of transformation:

- (172) *Lexical Rule*: If  $Q$  is a complex symbol of a preterminal string and  $(D,C)$  is a lexical entry, where  $C$  is not distinct from  $Q$ , then  $Q$  can be replaced by  $D$ . (Chomsky, 1965:84).<sup>162</sup>

For example, the sentence *sincerity may frighten the boy* is represented initially with the preterminal string in (173b):

- (173) a. Sincerity may frighten the boy.

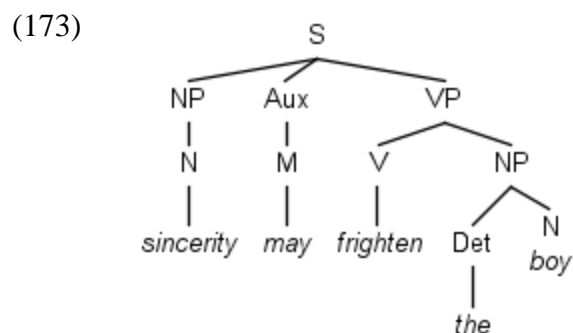


(Adapted from Chomsky, *ibid.*(26,59))<sup>163</sup>

<sup>161</sup> In addition to the complex symbols, these terminal points may also include *grammatical formatives*; Chomsky gives as examples of such formatives categories such as Perfect and Possessive (*ibid.*:65). He makes little mention of them, but they seem to approximately correspond to functional categories.

<sup>162</sup> Hudson (1976:90) points out that if  $Q$  is replaced only by  $D$  (the phonological form), then the syntactic features to which subsequent transformations might need to refer are entirely erased from the structure; for Chomsky's proposal to make any sense, then, this should be altered to " $Q$  can be replaced by  $(D,C)$ ." A similar distinction is apparent between the notions *phonological exponent* and *Vocabulary item* in Distributed Morphology; see §4.3.1 below.

Next, lexical items are inserted according to the lexical rule in (172) above, with the condition that their syntactic features must be nondistinct from the features of the preterminal string. The result is the initial phrase marker of the sentence<sup>164</sup>:



The phrase marker in (173) represents the *deep structure* level of the derivation. In the *Aspects* model, deep structure forms the input to the semantic component, on the one hand, and to the transformational component, which has as its output *surface structure*, on the other. This basic organization of the grammar came to be known as the *Standard Theory*.

#### 4.2.2 Early generative semantics

It was not long after *Aspects* (Chomsky, 1965) that an alternative to the Standard Theory began to emerge. *Generative semantics*, as this alternative was known, was never quite a

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<sup>163</sup> The complex symbol (particularly the one under V) is a good deal more complex than in my adaptation here, as Chomsky goes on to propose disjunctive context-sensitive rules for lexical entries (ibid.:§2.3.4).

<sup>164</sup> The symbol *M* here represents a modal, which introduces *may* by a lexical rule (although see Chomsky's fn. 9 for discussion of whether *M* is a lexical category like *V* or a functional category like *Det*).

cohesive model, but rather was more of a movement, one focused on taking the abstractions of the *Aspects* model and expanding them to the point where semantics was syntactically realized, and syntax proper had a far smaller role to play in a derivation. Characterizing the view of lexical insertion in this period is a bit like trying to hit a moving target, as Newmeyer (1986:93) notes: “[G]enerative semanticists never did agree on the locus of lexical insertion, nor even whether it occurred at some independently definable level at all.” However, I will review here some of the approaches to lexical insertion that generative semanticists argued for, as some of their insights may be somewhat more workable in the current theoretical context, and the model I propose in §4.4 will have some facets reminiscent of the work described here.<sup>165</sup>

An important document early in this movement was Lakoff and Ross’s “Is Deep Structure Necessary?” (1976 [1967]). In this short letter,<sup>166</sup> Lakoff and Ross propose that although the Standard Theory assumed that deep structure was the locus of lexical insertion, in fact “lexical items are inserted at many points of a derivation” (ibid.:1). For example, the varying syntactic mobility of idioms suggests that some must be inserted before transformations, and others must be inserted afterward. *Bury the hatchet* must be inserted before the passive transformation, they argue, as (174) is acceptable. *Kick the bucket*, however, must be inserted after the point where the passive applies (and only in cases where it does not apply), as (175b) is unacceptable. The idiom *be had* (‘be

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<sup>165</sup> Travis (2010:§4.4.1) points out that current models of the grammar are far more fine-tuned than those in the period in which generative semantics flourished, and thus more able to incorporate some of these distinctions; for example, sentential complements now come in many flavors, including CP, TP, vP, and VP, not just S.

<sup>166</sup> Addressed to Arnold Zwicky, this letter nonetheless seems to have been intended for wider distribution.



tricked'), however, must be inserted after the passive applies, as it's only acceptable in the passive (176a):

- (174) a. They buried the hatchet.  
       b. The hatchet was buried.
- (175) a. The gladiator kicked the bucket.  
       b. [\*ID] The bucket was kicked by the gladiator.
- (176) a. I've been had.  
       b. [\*ID] Someone has had me.

(Adapted from Lakoff & Ross, 1976 [1967]:1)

The conclusions Lakoff and Ross come to on the basis of this data, of course, depend on some crucial assumptions, such as whether the passive is an obligatory transformation and whether idioms need to be inserted in a contiguous manner; I will have more to say on this subject in §4.4 below.

Another argument that some lexical items are inserted *after* transformations apply came from McCawley (1976 [1967]), building on work from Lakoff's dissertation (1970 [1965]). Lakoff had argued there that for lexical items with inchoative / causative alternations such as *harden*, both the inchoative form in (177b) and the causative form in (177c) are transformationally derived from the adjective in (177a):

- (177) a. The metal is hard.  
 b. The metal hardened. (inchoative; ‘become hard’)  
 c. John hardened the metal. (causative; ‘cause to harden’)

(Lakoff, 1970 [1965](9-4))

Lakoff noted also that *dead*, *die*, and *kill* have properties corresponding to the predicates in (177), as (he claims) *die* means ‘become dead’, and *kill* means ‘cause to die’ (ibid.:98-100). However, unlike *hard*, *dead* cannot undergo the Inchoative transformation (178a), and unlike *harden*, *die* cannot undergo the Causative transformation (178b):

- (178) a. \*John deadened.   (‘John became dead’)  
 b. \*Bill died John.   (‘Bill caused John to die’)

At this point (1965), Lakoff had not yet rejected deep structure as the locus of lexical insertion, so he was forced to posit lexical exceptions for *dead* [-Inchoative] and *die* [-Causative].<sup>167</sup>

McCawley (1976 [1967]), however, arguing that there is “no linguistically significant level between semantic representation and surface structure” (ibid.:164), i.e., that there is no level of deep structure, took Lakoff’s observation and ran with it. In this paper, McCawley proposes the “prelexical transformation” of Predicate Raising to account for the relationships between *dead*, *die*, and *kill*. Prelexical transformations apply before lexical insertion, “to trees that terminate in semantic material rather than in lexical

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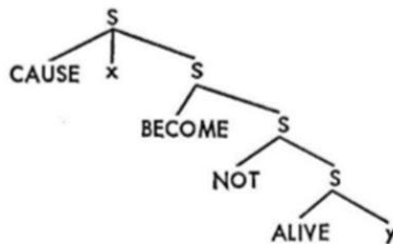
<sup>167</sup> See Newmeyer (1986:§4.2.4) for discussion.

material” (ibid.:157). Predicate Raising can apply iteratively, such that one predicate can raise to adjoin to another one, and both can then raise to adjoin to yet another. Lexical insertion can happen at any point between iterations of Predicate Raising, either to individual or to combined predicates.

For *kill*, which McCawley claims means ‘cause to become not alive’, the initial representation is as in (179a.ii); if lexical insertion occurs at this point, we can get only the sentence in (179a.i). However, if ALIVE is adjoined to NOT via Predicate Raising, as in (179b.ii), we may also insert the forms in (179b.i), substituting *dead* for NOT ALIVE. If NOT ALIVE is then adjoined to BECOME (179c.ii), we can substitute *die* for BECOME NOT ALIVE, thus yielding (179c.i). Finally, if BECOME NOT ALIVE is adjoined to CAUSE, as in (179d.ii), we can insert *kill* (179d.i).<sup>168</sup>

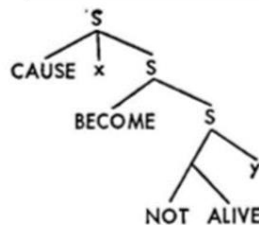
- (179) a. i. Bill caused John to **become not alive**.

ii.



- b. i. Bill caused John to become **dead**.

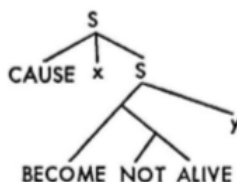
ii.



<sup>168</sup> Note that *x* here is *Bill* and *y* is *John*; both also raise via a separate process, not indicated in McCawley’s trees.

- c. i. Bill caused John to **die**.

ii.



- d. i. Bill **killed** John.

ii.



(Adapted from McCawley, 1976 [1967]:157-58)

In (179a-d), no level of deep structure is apparent. Note that despite their similarity to syntactic trees, these trees are purely semantic representations: “Syntactic and semantic representations are of the same formal nature, namely labeled trees” (ibid.:155).<sup>169</sup>

In the same paper, McCawley notes four possibilities for how lexical insertion might work. The first would be for all lexical items to be inserted at the end of a

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<sup>169</sup> Fodor (1970) provided a famous refutation of the Lakoff/McCawley proposal. Among other arguments that *kill* cannot mean ‘cause to die’, Fodor notes that although in (i), *do so* replacement can target either *die* or *cause*, the same is not true for (ii); this suggests that there is no constituent ‘Mary die’ in the deep structure of (ii.a):

- i. a. John caused Mary to die, and it surprised me that **he** did so.  
 b. John caused Mary to die, and it surprised me that **she** did so.
- ii. a. John killed Mary, and it surprised me that **he** did so.  
 b. \*John killed Mary, and it surprised me that **she** did so. (ibid.(13-16))

derivation (i.e., at surface structure). He rejects this possibility, however, claiming that some transformations depend on “the presence of specific morphemes and not just their meanings” (ibid.:156). *For*-deletion, for example, must occur following *want*, but is optional following *desire*:

(180 a. I want (\*for) you to win the prize.

b. I desire (for) you to win the prize.

(Adapted from McCawley, 1976 [1967](1-4))<sup>170</sup>

The second possibility would be for lexical insertion to happen at the very beginning of a derivation, before any transformations, as is the case in the *Aspects* model (Chomsky, 1965). The bulk of McCawley’s paper is an argument against this position; he summarizes his claim as follows:

[T]he complex of semantic material which a lexical item corresponds to need not be a constituent of the semantic representation per se but may be a constituent which arises through a transformation (ibid.:157).

If this is true, it cannot be the case that lexical insertion applies only before transformations, as in some cases the material it replaces is not a constituent until after a transformation applies.

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<sup>170</sup> McCawley notes that these facts are true for only some speakers; indeed, my judgements are actually the opposite of his, with *want* allowing *for*, but not *desire*.

McCawley therefore argues that either the third or fourth possibility must be correct (although he does not commit to either). The third would be that lexical insertion rules are “anywhere rules,” i.e., “rules which are not assigned a fixed ordering with respect to other rules but which apply whenever the configuration to which they apply arises” (ibid.:163). The fourth possibility is that lexical insertion happens after cyclic transformations (e.g., his Predicate Raising) but before postcyclic transformations (e.g., Adverb Preposing, WH movement). McCawley closes by noting that if the latter is the case, it would undermine his earlier claim that no linguistically significant level between semantic representation and surface structure exists.

Generative semantics eventually dissolved as a movement, for a host of reasons articulated at length elsewhere (Harris, 1993; Newmeyer, 1986:Chap. 5). The skepticism over deep structure did not entirely disappear, however, and eventually even Chomsky (1993) did away with it. As noted at the beginning of this section, generative semanticists never agreed on how lexical insertion worked, and partially because of this, their insights on this topic had little impact on its status in the Standard Theory.

#### *4.2.3 The Lexicalist Hypothesis*

The basics of lexical insertion did not change much between *Aspects* and Chomsky’s next major (syntax) work, *Remarks on Nominalization* (Chomsky, 1970 [1967]). However, some of the concerns in this work became important later in the context of arguments for Distributed Morphology (particularly in Marantz, 1997), so I will briefly review it here. The (somewhat implicit) theoretical question in *Remarks* was the abstractness of deep

structure, which Chomsky sought to reign in, in part as a wagon-circling response to generative semantics. The empirical question was whether “derived nominals” such as *refusal* in (181b) were inserted directly from the lexicon, or were transformationally derived from corresponding verbs such as *refuse* in (181a):

- (181) a. John refused the offer.  
       b. John’s refusal of the offer (Chomsky, *ibid.*(2b,4b))

Chomsky argued for the former position, which he refers to variably as the *lexicalist position* or the *lexicalist hypothesis*. The closest he comes to a formalization of this is as follows:

[A] great many items appear in the lexicon with fixed selectional and strict sub-categorization features, but with a choice as to the features associated with the lexical categories noun, verb, adjective. The lexical entry may specify that semantic features are in part dependent on the choice of one or another of these categorial features. (*ibid.*:22)

Evidence for a transformational derivation of (181b) from (181a) had come in part from the observation that co-occurrence restrictions that hold of sentences are similar to those that hold of noun phrases. For example, both *refuse* and *refusal* co-occur with arguments such as *John* and *the offer*, which must in both cases be in specific structural positions relative to the head; positing that a transformation derives the nominal from

*refuse* allows these restrictions to be stated only once. Chomsky (1970 [1967]), however, devises a framework which allows these restrictions to be stated in a lexicalist account, positing rules which operate over variables standing in for a lexical category:

- (182) a.  $XP \rightarrow [\text{Spec}, X'] X'$   
 b.  $X' \rightarrow X \dots$  (Adapted from Chomsky, *ibid.*(48,49))

The X in (182a) stands for any of the lexical categories (N, A, V), with the ellipses standing in for “the full range of structures that serve as complements” (*ibid.*:52).<sup>171</sup>

In sum, the lexicalist hypothesis as a whole had the effect of banning from the grammar transformations that changed the category of a lexical item, thus reducing the abstractness of the level of deep structure (Newmeyer, 1986:§4.5.1). For lexical insertion, this meant that that McCawley’s prelexical transformations were ruled out, and insertion remained a facet of deep structure only.<sup>172</sup>

#### 4.2.4 Extended Standard Theory / Government and Binding eras

Lexical insertion in Chomsky (1980) is essentially the same as in the Standard Theory above. However, the introduction of trace theory in this period (Chomsky, 1973, 1976; Fiengo, 1974, 1977) allowed for the possibility that lexical insertion applies not at deep

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<sup>171</sup> Although X-bar theory, as this framework came to be known, was eventually widely adopted, it had little direct impact at the time, and was seen by some at the time as nothing more than an attempt to prop up the lexicalist hypothesis (Harris, 1993:142).

<sup>172</sup> For more on the contrast between Chomsky’s (1965, 1970 [1967]) and McCawley’s (1976 [1967]) views on lexical insertion, see Hudson (1976).



structure (now rechristened merely as D-structure), but at surface structure (S-structure). This is because traces left behind by movement indicate D-structure configurations directly in the S-structure, allowing grammatical relations (e.g., with respect to thematic structure) which were in place *before* movement to be interpreted *after* movement.<sup>173</sup>

Although Chomsky (1980) maintains that lexical insertion applies at D-structure, as in earlier versions of the theory, he does admit (in a footnote) the plausibility of lexical insertion at S-Structure:

One might nevertheless argue that full lexical insertion, including phonological and morphological properties of words, takes place at the level of S-structure, along lines that have been suggested by [den Besten, 1976]. . . (Chomsky, 1980:Chap. 4, fn.10).<sup>174</sup>

Indeed, armed with trace theory, a number of researchers were starting to explore the possibility of S-structure lexical insertion during this period (e.g., Fiengo, 1980). I will look briefly here only at den Besten's, as it seems to be the earliest such proposal. Den Besten (1976) connects the question of lexical insertion to what he calls the *Counterdeletive Ordering Principle*, which states that rules involving lexical deletion are exclusively ordered *after* nondeletive rules, i.e., after all other transformations. For example, he discusses an "archaic" rule in German syntax that deletes *haben* and *sein* after the past participle, noting that this occurs only in subordinate clauses:

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<sup>173</sup> For discussion on this point, see Jackendoff (1997b:§4.4).

<sup>174</sup> Chomsky cites also Carlos Otero's "The Dictionary in a Generative Grammar" (1976) as having suggested this. I have been unable to get my hands on this paper, however; according to UGA's librarians, a few copies exist in Europe, but not a single copy is available in the U.S.

(183) a. . . . dass er gut geschlafen ~~hat~~.

that he well slept [has]

‘. . . that he has slept well’

b. Er  $\text{hat}_i$  /  $*\emptyset$  gut geschlafen  $t_i$ .

he has well slept.

‘He has slept well’ (Adapted from den Besten, *ibid.*(9a-b))

In German main clauses, the auxiliary *hat* ‘has’ raises to verb-second position; den Besten argues that this must occur before *haben*-deletion applies, for if the deletion rule applied first, its adjacency to the participle *geschlafen* ‘slept’ would cause it to be deleted. From this (and similar phenomena in Dutch), den Besten concludes that lexical items need not be inserted until the level of S-structure, when non-deletive transformations have already applied. Den Besten explicitly points to trace theory as allowing for this possibility:

[S]urface lexicalization requires the presence of traces for any constituent that is moved. One might say it differently: Given a theory which uses traces all over the place[,] surface lexicalization is possible (*ibid.*:4).

Nonetheless, in Chomsky’s (1981) *Lectures on Government and Binding*, we have much the same view of lexical insertion as previously: “Base rules generate D-structures (deep structures) through insertion of lexical items into structures generated by [the

categorial component]” (ibid.:5). However, these lexical items play a larger structural role via the Projection Principle:

- (184) *Projection Principle*: Representations at each syntactic level (i.e., LF, and D- and S-structure) are projected from the lexicon, in that they observe the subcategorization properties of lexical items (ibid.:29).

Chomsky again allows for the possibility of S-structure lexical insertion in a footnote (ibid.:Chap 2, fn. 82).<sup>175</sup> However, by and large, most work in the Government and Binding era still assumed D-structure insertion as a matter of course.<sup>176</sup>

#### 4.2.5 *The Minimalist Program*

It is not until the Minimalist Program (MP; beginning with Chomsky, 1993, 1995) that lexical insertion is significantly different from the *Aspects* model. Indeed, in certain respects it is a return to the pre-*Aspects* model, with lexical items introduced into a derivation gradually, as Lasnik (2002) points out. In the MP, there is no divide between D-structure and S-structure; instead, lexical insertion (in MP terms, External Merge) is interspersed with movement (Internal Merge). I will only very briefly sketch out the

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<sup>175</sup> Chomsky also opens the door for S-structure insertion in a few odd cases, such as when an argument is inserted in a non-theta position, such as the matrix subject of a predicate like *is easy* (ibid.:§5.4). I confess to finding this argument counterintuitive; it’s not clear why a standard raising analysis would not work here.

<sup>176</sup> That is, most works that assumed the existence of D-structure as a separate level at all.

basics of Minimalist insertion and structure-building here, assuming that the reader is basically familiar with the model due to its current prominence in the field.

In the MP, derivations begin with a Numeration, or an array of lexical items chosen from the lexicon:

- (185) *Numeration*: [A] set of pairs (LI,  $i$ ), where LI is an item of the lexicon and  $i$  is its index, [i.e.] the number of times that LI is selected (Chomsky, 1995:225).

The operation *Select* then copies a lexical item from the Numeration, reduces its index by one, and introduces it into the derivation via the operation *Merge*:

- (186) *Merge*: Take a pair of syntactic objects ( $SO_i$ ,  $SO_j$ ) and replace them with a new combined syntactic object  $SO_{ij}$ .

(Adapted from Chomsky, 1995:226)

In the MP, then, lexical items are not “inserted” into structures; rather, the structures are built incrementally by combining lexical items with each other (the initial application of External Merge), or with the syntactic object under construction (subsequent applications of External Merge); additionally, parts of the syntactic object may be remerged in a higher position (Internal Merge). Once the Numeration is exhausted, and only a single syntactic object (i.e., the structure created by Merge) remains, the derivation is transferred to the interfaces with the phonological and

interpretive components, at which point it is assessed: “a derivation *D* *converges* if it yields a legitimate SD [Structural Description] and *crashes* if it does not” (Chomsky, 1995:171). For a derivation to converge as a whole, it must converge at *both* the level of Phonological Form (PF) and at the level of Logical Form (LF), generating legitimate phonological and interpretive structural descriptions.

This basic picture is intact in later versions of the MP (e.g., Chomsky, 2001, 2008), which differ primarily in that the transfer of structures to the interfaces happens not at the end of a derivation, but cyclically, i.e., at the completion of a unit of computation known as a *phase*, corresponding to vP and CP (and possibly smaller structures such as DP and PP). Although for ease of exposition, the model I propose below is couched in pre-phase-theoretic terms, I return to how to accommodate this model with phase theory in Chapter 5.

#### 4.2.6 Conclusion

In this section, I’ve provided a tour of how lexical insertion was viewed at various stages in the history of generative grammar, including the orthodox *Aspects* model (Chomsky, 1965), the heterodox movement known as generative semantics (Lakoff & Ross, 1976 [1967]; McCawley, 1976 [1967]), the Standard Theory (Chomsky, 1970 [1967], the Extended Standard Theory and Government and Binding era (Chomsky, 1980, 1981), and the currently ascendant Minimalist Program (Chomsky 1993, 1995, 2001, 2008). In §4.3, I take a detailed look at a theory in which lexical insertion is not a unitary feature

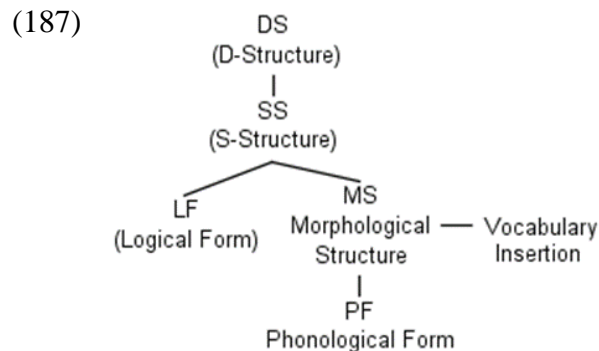
associated with D-structure / External Merge, but is rather distributed across two independent levels of the derivation. This theory is known as Distributed Morphology.

### *4.3 Late insertion models*

In this section, I look at the model of the grammar known as Distributed Morphology, first reviewing the theory as originally proposed in the 1990s in various works by Halle and Marantz, and then considering later revisions, including Embick's (2000) return to early insertion and Harley's (2014) arguments that Roots are semantically undifferentiated in the syntax. I provide arguments against the latter two revisions, and conclude that a psycholinguistically grounded model of sentence generation requires both late phonological insertion and semantically individuated roots, as in Pfau (2009).

#### *4.3.1 Overview of Distributed Morphology*

The model known as Distributed Morphology (DM), first proposed in Halle and Marantz (1993), departs from traditional lexicalist views in a number of ways. As in affixless approaches such as that of Anderson's (1992) "A-morphous Morphology," Halle and Marantz argue that the syntax manipulates bundles of features with no phonological content. However, unlike in Anderson's theory, in which word-stems combine with morphosyntactic features to trigger schematic changes to the stem, in DM affixation is the primary morphological process in a derivation. The architecture of DM as originally conceived is in (187):



(Adapted from Halle & Marantz, 1993(1))

In this section, I will describe the main features of DM as represented in (187), reserving for the following sections discussion of subsequent formulations of this model. The key principles can be summarized as follows:

First, syntax is the primary generative engine underlying both sentence- and word-formation; this is frequently summed up as “Syntactic hierarchical structure all the way down” (Harley & Noyer, 1999:3). All morphemes relevant to interpretation are combined in the syntax; affixes with interpretable features head syntactic projections. Affixes relevant only at PF, such as those corresponding to morphological case,<sup>177</sup> are instead added postsyntactically, at the level of *Morphological Structure* (MS);<sup>178</sup> this is the interface level between syntax and phonology. Given this view of word formation, DM specifically rejects the Lexicalist Hypothesis of Chomsky (1970 [1967]),<sup>179</sup> where

<sup>177</sup> This is not to deny that abstract Case is a syntactic feature, merely that associated language-specific morphemes are irrelevant at LF, and therefore introduced after the derivation splits.

<sup>178</sup> In later formulations, MS is the site of readjustment rules which apply before Vocabulary insertion at PF.

<sup>179</sup> See §4.2.3 above. For a near-contemporaneous lexicalist model, see e.g. DiSciullo & Williams (1987), who explicitly treat words as syntactic atoms. For arguments against the lexicalist hypothesis, see Marantz (1997); a more recent discussion outside of the DM framework is Bruening (2018).

special sound/meaning correspondences are stored in one generative lexicon, and where word-formation and sentence-formation are entirely different kinds of processes.

Second, as originally formulated, lexical insertion in DM comes in two stages, from two separate lists, with a third for interpretation. At D-structure, abstract roots with bundles of syntactic and semantic features are inserted from List 1 into the structures generated by the base; the terminal nodes occupied by these roots are referred to in early DM as *morphemes*. After all syntactic operations are complete, the derivation branches, with these still-abstract morphemes transferred separately to Logical Form (LF) and to Morphological Structure (MS). At LF, idiosyncratic semantic information about a morpheme (i.e., not purely featural information such as [<sub>+</sub>ANIMATE]) is referenced from a separate list called the Encyclopedia, or List 3.<sup>180</sup> At MS, Vocabulary Insertion selects from List 2 a set of Vocabulary items, which consist of a pairing of 1) phonological forms, or *exponents*, and 2) a set of syntactic and semantic features constituting the instructions governing their insertion. The exponents are said to *expone* the terminal nodes into which they're inserted; this is possible where Vocabulary items match a set or subset of the features of the terminal node:

[I]nsertion requires only that the feature bundle of the Vocabulary item be nondistinct from the features of the terminal node at MS that serves as the site of insertion (Halle & Marantz, 1993:121).

This was formulated more explicitly in Halle (1997):

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<sup>180</sup> I discuss the question of where and how semantic information is represented in different versions of DM in §4.3.4 below.



- (188) *Subset Principle*: The phonological exponent of a Vocabulary Item is inserted into a morpheme in the terminal string if the item matches all or a subset of the grammatical features specified in the terminal morpheme. Insertion does not take place if the Vocabulary Item contains features not present in the morpheme. Where several Vocabulary Items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen (ibid.(7)).

This leads us to the final key feature of DM as originally conceived: Vocabulary items may be *underspecified* with respect to insertion. In other words, the feature complexes of the terminal node and the Vocabulary item need not entirely match; the features of the Vocabulary item must merely not conflict in their specifications with those of the terminal node. For example, the Vocabulary item *the* is unspecified for plurality in English, but nonetheless can be inserted into either [-PL] or [+PL] contexts, as in (188), as no more specific form exists which would block it:

- (188) a. [DP [D  $\sqrt{+DEF, -PL}$ ] [NP [N  $\sqrt{DOG-PL}$ ]]  
 b. *the dog*  
 c. [DP [D  $\sqrt{+DEF, +PL}$ ] [NP [N  $\sqrt{DOG+PL}$ ]]  
 d. *the dogs*

In (188a), we have an abstract root  $\sqrt{+DEF, +PL}$  occupying a terminal node.<sup>181</sup> Although the Vocabulary item *the*<sub>[+DEF]</sub> is not specified as either singular or plural, its phonological exponent can nonetheless be inserted here, as in (188b), as it matches a subset of the features of the terminal node. The very same Vocabulary item can be inserted into  $\sqrt{+DEF, +PL}$  in (188c), producing (188d), as it matches a subset of the features there as well.<sup>182</sup>

In addition to word-internal syntax, late insertion, and underspecification, two more facets were soon added to the theory: a distinction between functional and lexical morphemes, and the acategorial nature of the latter. I turn to these in the next section.

#### 4.3.2 Functional v. lexical morphemes

Early work in Distributed Morphology (DM) focused on functional morphemes, for which a language generally has only one acceptable exponent. With lexical morphemes, however, the second part of Halle's (1997) Subset Principle (repeated here) does not apply:

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<sup>181</sup> In most DM formalisms, the  $\sqrt{\phantom{x}}$  symbol indicates an abstract morpheme. The Root  $\sqrt{DOG}$ , then, is not to be read as *dog*, but instead as 'dog' (if Roots are semantically individuated; see discussion of Harley (2014) in §4.3.4-5 below). It will not always be realized as *dog*, as other phonological exponents such as *canine* exist. Note also that some versions of DM use this symbol only for lexical morphemes, not functional morphemes such as  $\sqrt{+DEF, +PL}$ , whereas I use it for both. Furthermore, some authors (e.g. Harley 2014) use it when referring to the exponents of Roots, as in  $\sqrt{dog}$ . Except where quoting such authors directly, I use it only for an abstract Root without a phonological exponent, what I refer to below as *Roots-as-nodes*.

<sup>182</sup> The situation is different for other languages, of course; in Spanish, differing forms would be inserted into the morphemes in (188a,c), viz. *el* and *los*, respectively. (A gender feature would be required here as well.)

Where several Vocabulary Items meet the conditions for insertion, the item matching the greatest number of features specified in the terminal morpheme must be chosen (ibid.(7)).

This is because with lexical morphemes, there will frequently be more than one possible exponent consistent with the features of the abstract morpheme. For example,  $\sqrt{\text{CAT}}$  has as a possible exponent not only *cat*, but also *feline*, *pussycat*, *tabby*, and *kitty*, as well as less specific terms such as *pet* or *animal*. Harley and Noyer (1998, 1999) characterize functional and lexical morphemes as follows:

F-morphemes [functional morphemes] are those whose content (as defined by syntactic and semantic features made available by Universal Grammar) suffices to determine a unique phonological expression. . . In contrast, an l-morpheme [a lexical morpheme] is defined as one for which there is a choice in spell-out: an l-morpheme is filled by a Vocabulary Item which may denote a language-specific concept (Harley & Noyer, 1999:4).

In this context, Harley and Noyer describe also what they term the *L-Morpheme Hypothesis*:

[T]he traditional terms for sentence elements, such as noun, verb, and adjective, have no universal significance and are essentially derivative from more basic morpheme types (ibid.:4).

Under this view, lexical morphemes are inherently acategorical, and take on different categories only in given syntactic contexts; this depends on the nearest c-commanding functional morpheme, what Harley and Noyer (1998) refer to as a *licenser*. For example, the root  $\sqrt{\text{DESTROY}}$  will surface as a noun if immediately c-commanded by D (or possibly *n*), or as a V if immediately c-commanded by T (or possibly *v*). The projection associated with this abstract root is  $\sqrt{\text{P}}$ , with the abstract morpheme  $\sqrt{0}$  only contextually taking on the characteristics of N, V, or A.

Given these refinements, we now have a fairly complete picture of morphosyntax in early Distributed Morphology. I will note, however, that much work in DM is on the morphophonology side, where a series of readjustment rules operate in the Morphological Structure component to produce, e.g., irregular forms such as  $\sqrt{\text{BRING}} + \sqrt{+\text{PAST}} \rightarrow$  *brought*. For these morphophonological questions, I refer the interested reader to Halle and Marantz (1993), Halle (1997), Harley and Noyer (1999), Embick and Halle (2005), and Embick and Noyer (2007), as well as to references therein.

#### 4.3.3 *The timing of insertion of lexical morphemes*<sup>183</sup>

In Halle and Marantz (1993), late insertion was simply assumed for all morphemes;

Marantz (1995), in “A late note on late insertion,” argues for it explicitly.<sup>184</sup> Embick

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<sup>183</sup> Embick (2000) actually refers to lexical morphemes as *Roots*; in this section, I use the former term to refer to his claims about Roots, partially for expository purposes, but also due to some confusion over the term among different authors (Acquaviva, 2008). In particular, Embick uses *Root* to refer to a slightly different construct than in my use of the term in subsequent sections. I discuss this further at the beginning of §4.3.4, where I introduce Acquaviva’s distinction between Roots-as-nodes and Roots-as-exponents.

(2000), however, argues that late insertion can be falsified if a feature can be found that is an arbitrary (i.e., not a systematic) property of a given Vocabulary item which nonetheless contributes to some syntactic process. This would be evidence, then, for early insertion, in which the phonological exponent is present in the narrow syntax.<sup>185</sup> Embick claims that this is the case for the [passive] feature in Latin deponent verbs, which he argues have this feature inherently. Deponent verbs such as *hortor* ‘to exhort’ only appear with passive morphology, as in (189d), despite having an active interpretation (compare (189b)):

- (189) a. *am-o, am-as* (Present Active morphology)  
           ‘I love, you love’  
       b. *am-or, am-ā-ris* (Present Passive morphology)  
           ‘I am loved’, ‘you are loved’  
       c. *\*hort-o, hort-as* (Present Active morphology)  
       d. *hort-or, hort-ā-ris* (Present Passive morphology)  
           ‘I exhort’, ‘you exhort’

(Adapted from Embick, 2000(3-6))

Note that *hortor* has no present active form (189c), but rather has an active interpretation in the passive (189d). This distinction extends to the perfect, as well:

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<sup>184</sup> My own arguments for late insertion (with respect to idioms) can be found in §4.4.

<sup>185</sup> Embick assumes that even if his argument goes through and lexical morphemes must be inserted early, functional morphemes are still inserted late. This is due in part to the proper exponent of a functional morpheme depending on its syntactic context; Embick assumes this is not the case for lexical morphemes.

- (190) a. *am-ā-v-i, am-ā-v-istī* (Perfect Active morphology)  
 ‘I have loved, you have loved’  
 b. *am-ā-t-us sum* (Perfect Passive morphology)  
 ‘I am loved’  
 c. *\*hort-ā-v-i, hort-ā-v-istī* (Perfect Active morphology)  
 d. *hort-ā-t-us sum* (Perfect Passive morphology)  
 ‘I have exhorted’

(Adapted from Embick, 2000(3,8))

In the perfect, the Latin passive is not synthetic, but analytic, requiring the separate syntactic head *sum*; thus it seems likely that passive is not a purely morphological feature of deponents, one that could in theory be added postsyntactically. In Embick’s analysis, [passive] is an inherent feature of deponent verbs, a feature that has syntactic consequences in that it must co-occur with the auxiliary *sum* in the perfect. However, it is not merely the case that the deponent triggers a fully passive syntax, as transitive deponents such as *sequor* ‘to follow’ appear with both nominative subjects and accusative objects, despite their passive morphology:

- (191) *Puer mīlitem sequi-tur*  
 boy-NOM soldier-ACC follow-PASS.3SG  
 ‘The boy followed the soldier’

Given the existence of such forms, [passive] cannot merely be a syntactic feature which triggers passive syntax with an idiosyncratic active interpretation. Rather, Embick argues that it is an arbitrary feature of deponent verbs that their morphological form, including the passive auxiliary *sum* in the perfect, is passive, but that the larger syntax that surrounds these verbs is active: “[P]assive syntax, and the features underlying it, is distinct from the feature [pass] that results in passive forms” (ibid.:194). The deponent Vocabulary Items themselves, Embick reasons, must therefore be present at the outset of the derivation.

Haugen and Siddiqi (2013:§3), however, revisit Embick’s arguments and discuss several alternative analyses, noting that Latin also has a small class of *semideponent* verbs, which show irregular passive morphology only in the perfect:

- (192) a. *audēo, audēs* (Present Active morphology)  
           ‘I dare, you dare’  
       b. *audeor, audēris* (Present Passive morphology)  
           ‘I am dared’, ‘you are dared’  
       c. *\*audāvi, audāvistī* (Perfect Active morphology)  
       d. *ausus sum* (Perfect Passive morphology)  
           ‘I have dared’

Semideponent verbs, then, are deponents with irregular forms only in one specific environment: the perfect. Haugen and Siddiqi therefore conclude that semideponents are *regular* verbs that become deponents as a result of contextual allomorphy. They propose

an analysis that had been considered but rejected by Embick (2000), in which there are two locations where the feature [passive] is generated. The first is under  $v^0$ , for true passives; this feature is associated with the lack of an external argument in the specifier of  $vP$ . The second location is under a  $\sqrt{0}$  node, i.e., the head of the complement of  $v$ .<sup>186</sup> When [passive] appears on  $\sqrt{0}$ , it triggers the morphological passive associated with deponents (in all cases) and semideponents (only in the perfect), but has no effect on the external argument in the specifier of  $vP$  (or on accusative Case assignment).

Embick rejects this second analysis, in which [passive] is a feature on  $\sqrt{0}$ , due to concerns over needlessly complicating Latin syntax by allowing [passive] to appear on multiple heads. Haugen and Siddiqi (2013:513-14), however, argue that “a slight complication of Latin syntax is to be preferred to the radical overhaul of the theory,” and that this analysis is therefore preferable over the one Embick eventually settles on.

Regardless, Haugen and Siddiqi note that even if Embick’s analysis of the [passive] feature on deponents is correct, the conclusion that deponents are individuated phonologically *as well* is not inescapable, as several plausible alternate models would not require this. In models such as Siddiqi’s (2009), as well as in Pfau’s (2009) psycholinguistically grounded study of DM, lexical morphemes have full semantic content in the syntax as well as grammatical features, which could potentially include Embick’s [passive] feature. In Harley’s (2011) model,<sup>187</sup> lexical morphemes are not semantically individuated, but still have lexically specified syntactic features, so Embick’s [passive] is workable in this model, as well. In other words, the only reason for

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<sup>186</sup> Under a more traditional analysis in which lexical morphemes have inherent categories, this would be  $V^0$ .

<sup>187</sup> Haugen and Siddiqi refer here to a 2011 ms. version of Harley (2014); I look at this model in the following two sections.



Embick to return to early insertion is to maintain the connection between the syntactic features of a lexical morpheme and its phonological exponents, which is unnecessary under other plausible versions of DM such as in Pfau's or Siddiqi's models, or as in Harley's.

Although on the face of it, Embick's (2000) early insertion and Haugen and Siddiqi's (2013) late insertion analyses of Latin deponents are both plausible, in §4.4 below I return to the question of when phonological features are inserted into a derivation, arguing that the conclusions about idioms in chapters 2 and 3 here are far more parsimoniously accounted for if late insertion is assumed. In the following sections, I consider Harley's (2014) late insertion model, including the question of where semantic information is represented, and in §4.3.6 discuss Pfau's (2009) model, including psycholinguistic evidence for late insertion.

#### 4.3.4 *On the nature of roots*

In the previous section, I explored Embick's (2000) arguments for early insertion using the term *lexical morpheme* in place of Embick's chosen term *Root*. Part of the reason for this is that a good deal of confusion in early Distributed Morphology surrounded the use of this term, as Harley (2014:fn. 4) notes. Before considering Harley's arguments with respect to the properties of Roots, I will briefly try to clear up the terminology here.

Acquaviva (2008:11-12) distinguishes between two uses of the term *Root* in DM: *Root-as-node*, and *Root-as-exponent*. The first construct, *Root-as-node*, refers to a *lexical node* (L-node), what Halle and Marantz (1993) originally referred to as a *morpheme*, and

what I referred to above as an “abstract root” or “abstract morpheme”; these are the elements chosen at Numeration. Acquaviva defines *Root-as-node* as a “terminal allowing non-deterministic Vocabulary insertion” (ibid.:11). *Root-as-node* or *lexical node*, then, contrasts with *functional node* (F-node), a terminal for which insertion of Vocabulary items is fully deterministic (in accordance with Halle’s (1997) Subset Principle). In this chapter, I will refer to *Roots-as-nodes* as *N-Roots*.

The second construct, *Root-as-exponent*, refers to a “Vocabulary item inserted in an L-node.” As Acquaviva notes (ibid.:11), this presupposes that the phonological forms of lexical morphemes are inserted late. In a model which assumes the converse of this, such as those in Embick (2000) and Embick and Noyer (2007), *Root-as-node* and *Root-as-exponent* refer to the same syntactic object. The separation between these two terms comes as a consequence of separating syntactic from phonological features, as originally argued for in Halle and Marantz (1993), Marantz (1995), and other early work, and thus is irrelevant in Embick’s model, which is why he can refer to *Root* as a unitary concept. In the remainder of this dissertation, I assume that this distinction between *Root-as-node* and *Root-as-exponent* is valid, and where I use the term *Root*, the intended meaning is as for Acquaviva’s *Root-as-node*, a lexical morpheme chosen at Numeration. In the remainder of §4.3, however, I will refer to *Roots-as-exponents* as *E-Roots*; when paraphrasing authors who use merely the term *Root*, I will generally use either *N-Root* or *E-Root* based on what their intent seems to be in context, noting this explicitly only where necessary.

Harley (2014) considers three questions about the identity of Roots; the first two questions I consider here, the third in the following sections. The first question is whether

or not Roots-as-nodes are fully individuated in the narrow syntax, or whether the same N-Root, say  $\sqrt{+COUNT, +ANIMATE}$ , is realized in separate derivations as *cat*, *dog*, *porcupine*, etc., as Marantz (1995) had suggested, with speakers free to choose one form or the other corresponding to communicative intent. This question, Harley argues, rests on whether the phenomenon of root suppletion exists, i.e., whether the same N-Root may have more than one unrelated phonological exponent that can be inserted into it.<sup>188</sup> Suppletion in functional categories is quite common; for example, the English plural has morphologically conditioned allomorphs such as [-z], [-en], [i], and [Ø], all of which are in active competition at insertion, with the winner decided by the Subset Principle. However, if true N-Root suppletion exists, this would be evidence not for free choice insertion, but rather for competition, similar to that for functional items, and thus for N-Roots which are individuated in the syntax.

Apparent N-Root suppletion exists in English for a small number of cases, such as for *go* ~ *went*; Marantz (1997) had suggested that such cases actually represent realizations of functional categories such as *v*, rather than lexical morphemes, and are limited to light verbs (and possibly light adjectives and nouns, realizations of *a* and *n*). However, Harley points to a variety of suppletive verbs in Hiaki,<sup>189</sup> for which it seems unlikely that a light verb analysis is possible:

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<sup>188</sup> If the phonological exponents are related, as in *goose* and *geese*, DM has procedures to derive one from the other via the phonological readjustment rules. Readjustment rules have “the limited expressive power of phonological rules,” and cannot be used to “relate the phonetic exponents of radically different shapes” (Embick & Halle, 2005:17), i.e., they cannot account for suppletion. Haugen and Siddiqi (2013:§2.1), however, argue that no principled definition of “radically different” is possible, and that suppletion should therefore not be viewed as a categorical phenomenon.

<sup>189</sup> An Uto-Aztecan language spoken in the Sonoran Desert region (southern Arizona and across the Mexican border in Sonora), also known as Yaqui and Yoeme.

(193) Hiaki:

- a. *vuite* ~ *tenne*            ‘run.sg ~ run.pl’
- b. *weama* ~ *rehte*           ‘wander.sg ~ wander.pl’
- c. *kivake* ~ *kiime*           ‘enter.sg ~ enter.pl’
- d. *vo’e* ~ *to’e*            ‘lie.sg ~ lie.pl’

(Harley, *ibid.*.(3a,c-e))

Given that N-Root suppletion is a real phenomenon, Harley concludes that the E-Roots *vuite* and *tenne* compete for insertion in the same individuated N-Root, with *tenne* only appearing in [+PLURAL] environments, and *vuite* appearing elsewhere.<sup>190</sup>

Harley turns next to the question of *how* N-Roots are individuated. In her §2.2, she presents arguments that N-Roots cannot be phonologically individuated in the syntax, i.e., that their phonological exponents are inserted postsyntactically. The very existence of suppletion constitutes a strong argument for this position, as the insertion of *go* and *went* are dependent on the morphosyntactic context in which an N-Root appears. Indeed, Harley writes that the existence of N-Root suppletion “proves” that N-Root terminals are subject to late insertion; if E-Roots were inserted early, “root suppletion. . . would be an incoherent notion” (*ibid.*:237).<sup>191</sup>

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<sup>190</sup> Harley further argues that since *vuite*’s distribution is merely described as “elsewhere,” if it did not apply only to a given individuated root, it would block the insertion of “*any* non-supplementing intransitive verb with a plural subject” (*ibid.*:236).

<sup>191</sup> Although I agree with the conclusion, I think this is putting it a little too strongly; there are *a priori* plausible early insertion analyses of suppletion, viz. virtually every analysis of suppletion before DM came on the scene. For example, the presence of a past Tense head in Numeration could condition the choice of *went* over *go* from the lexicon (given other assumptions).

#### 4.3.5 *The semantic individuation of N-Roots*

Next, Harley argues that although N-Roots *are* individuated in the syntax and are not individuated phonologically, neither are they individuated semantically. In order to demonstrate this, Harley notes, one would need evidence of the existence of an N-Root “whose semantic interpretation is not identifiable prior to its appearance in a derived morphosyntactic context” (ibid.:238). If it can be shown that the semantics of at least some N-Roots are dependent on the context, we can conclude that N-Roots are not semantically individuated in the narrow syntax.

Harley’s first argument comes from the root-and-pattern morphology characteristic of Semitic languages. In such languages, many word-forms are produced via a unique kind of nonconcatenative morphology, in which semantically rich consonantal schemata are combined with templates known in Hebrew as *binyanim* (sg. *binyan*) and in Arabic as ‘*awzan* (sg. *wazn*). These consonantal schemata, which are usually *triliteral* (composed of three consonants), are generally referred to by Semiticists as *roots*; for the purposes of this section, I will refer to this (typological) construct as an *S-Root*, for *Semitic Root*.

Both the S-Root and the pattern contribute aspects of meaning to the word-form, with the S-Root contributing the core meaning, and the pattern being either derivational or inflectional. For example, in Arabic, the triliteral S-Root *k-t-b* underlies the forms in (194), and *d-r-s* the equivalent forms in (195):

(194)	<i>Template</i>	<i>Word-form</i>	<i>Meaning</i>
	a. CaCaCa	<i>kataba</i>	‘he wrote’
	b. yaCCuC	<i>yaktub</i>	‘he writes’
	c. CaCCaC	<i>kat:aba</i>	‘he made someone write’
	d. CuCiCa	<i>kutiba</i>	‘it was written’
	e. (mu)CaaCiC	<i>ka:tib</i>	‘writer’
	f. maCCaCa	<i>maktaba</i>	‘library’
(195)	<i>Template</i>	<i>Word-form</i>	<i>Meaning</i>
	a. CaCaCa	<i>darasa</i>	‘he studied’
	b. yaCCuC	<i>yadrus</i>	‘he studies’
	c. CaCCaC	<i>dar:asa</i>	‘he taught’
	d. CuCiCa	<i>durisa</i>	‘it was studied’
	e. (mu)CaaCiC	<i>muda:ris</i>	‘tea’
	f. maCCaCa	<i>madrasa</i>	‘school’

Although the interpretations in (194-195) are fairly predictable given knowledge of the meaning of the S-Root and the meaning of the template, this kind of morphology is not always semantically compositional. Harley (citing Aronoff, 2007) points to the varying realizations of the Hebrew S-Root *k-b-ʃ* in different binyanim:

(196)	<i>Template</i>	<i>Word-form</i> <sup>192</sup>	<i>Meaning</i>
	a. CeCeC	<i>keve</i> ]	‘gangway, pickled fruit’
	b. CCiC	<i>kvi</i> ]	‘highway’
	c. maCCeC	<i>maxbe</i> ]	‘press’
	d. miCCaCa	<i>mixba</i> ]a	‘pickling shop’
	e. CaCaC	<i>kava</i> ]	‘subdue, press, pave, pickle, etc.’
	f. CiCeC	<i>kibe</i> ]	‘subdue, pave, pickle, preserve, etc.’
	g. hiCCiC	<i>hixbi</i> ]	‘subdue, subjugate’

(Adapted from Harley, 2014(9), and Aronoff, 2007:822)

Aronoff notes that “trying to find a common [synchronic] meaning shared by pickles and highways brings one close to empirical emptiness” (ibid.:822). Clearly, the combination of binyan and S-Root is not semantically compositional in Hebrew, at least from a synchronic perspective.

It should be noted, too, that S-Roots belong to varying morphological alternation classes in Hebrew; these classes have systematic morphophonological behavior. For example, the S-Roots *n-p-k* and *n-p-l* belong to different classes, such that in the former case, the first consonant (/n/) is lost under prefixation by the infinitive marker *li-* (197b), but in the latter case it is not (197d):

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<sup>192</sup> The phonological variation apparent here (e.g., /k/ → [x] / \_\_ C) is presumably irrelevant.

- (197) a. *nafal*            ‘fell’  
        b. *lipol*            ‘to fall            (\**linpol*)  
        c. *nafak*            ‘resulted’  
        d. *linpok*           ‘to result’        (\**lipok*)

Harley writes that because the deletion pattern in (197b) cannot be derived from general properties of Hebrew phonology, S-Roots such as *n-p-l* constitute an irregular alternation class:

The alternation has become a stored property associated with particular **roots**, whose class membership [is] identified as a property of the root, *regardless of which meanings it receives in which contexts*. The fact of alternation class membership thus proves **the integrity of the root as an individual[ly] listed item** in the mind of the speaker, across all of its different semantic interpretations, since it participates in the alternation regardless of which meaning it is carrying at the time (Harley, *ibid.*:240; italics in original, boldface my emphasis).

Here is where I will part company with Harley. What Semiticists refer to as a “root” is not identical to either of the theoretical constructs involved in this discussion: Root-as-node (N-Root), and Root-as-exponent (E-Root). I return to Acquaviva’s (2008) definitions:



- (198) a. *Root-as-node*: A terminal allowing non-deterministic Vocabulary insertion
- b. *Root-as-exponent*: A Vocabulary item inserted in an L-node [i.e., inserted into a node occupied by an N-Root]

Given that Harley, Acquaviva, and I all assume late insertion of phonological exponents, we should be able to clear this up. The first notion, *Root-as-node*, refers to an abstract morpheme added into the syntax at Numeration; N-Roots by hypothesis have no phonology. The second notion, *Root-as-exponent*, is a Vocabulary item: a pairing of a phonological exponent and a set of instructions determining which N-Roots that exponent can be inserted into.

Given that what the S-Roots in (194-196) share is elements of their phonological form (extending to morphophonology), it seems that we must identify them as *morphophonologically homogeneous classes of E-Roots*. They cannot be N-Roots; N-Roots (by hypothesis) have no phonology. To the extent that Harley is correct that Aronoff's alternation classes prove "the integrity of the root [*k-b-ʃ*]" as an individual[ly] listed item in the mind of the speaker," such a "root" is not an N-Root, but a class of E-Roots, i.e., a class of phonologically individuated<sup>193</sup> Roots-as-exponent with the same morphophonological distribution. Thus Harley's argument fails to go through; the existence of a class of E-Roots with varying semantic interpretations does *not* tell us that they are all exponents of the same semantically empty N-Root.

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<sup>193</sup> That is, as a class they are individuated from other Vocabulary items by their morphophonology; they are individuated from each other by the features that constitute their instructions for insertion.

Note that it may still be the case that the class of E-Roots represented by an S-Root like *k-b-ʃ* has a range of possible distribution sites exactly corresponding to some semantic class of N-Roots, such that whenever one of the N-Roots appears in the syntax, one of the corresponding E-Roots is inserted. For example, the Arabic data in (195) above represents a class of E-Roots we might refer to as the S-Root *k-t-b*, all of which are inserted into a class of N-Roots sharing a semantic component associated with writing:

- (199) a.  $\sqrt{+PAST} \sqrt{WRITE} \sqrt{3.SG.MASC.} \rightarrow kataba^{194}$   
           ‘he wrote’  
       b.  $\sqrt{+PAST} \sqrt{CAUSE} \sqrt{WRITE} \sqrt{3.SG.MASC.} \rightarrow kat:aba$   
           ‘he made X write’  
       c.  $\sqrt{+DEF} \sqrt{WRITER}^{195} \rightarrow alka:tib$   
           ‘the writer’

However, naturally occurring languages are messier than this, and as with Hebrew, in Arabic the S-Root *k-t-b* has as one of its E-Roots the noun *kati:ba*, which means ‘battalion’. Although presumably there is a diachronic relationship to ‘write’ here (perhaps derived from the written orders sent to a battalion), there is clearly no synchronic relationship.<sup>196</sup>

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<sup>194</sup> Under some analyses of Arabic, this is a perfect form, not a past tense form, but the distinction shouldn’t matter here.

<sup>195</sup> This representation assumes merely that  $\sqrt{WRITER}$  has a semantic component ‘write’; whether or not it can be decomposed morphosyntactically is another question, one I will not pursue here.

<sup>196</sup> Along similar lines, Aronoff (ibid.:821-22) notes that what *kvuʃim* ‘pickles’ and *kviʃim* ‘highways’ have in common diachronically is that roads in historical Palestine were made of

In addition to her arguments on the basis of Semitic morphology, Harley (ibid.:240-41) points also to a class of “identifiable roots” in English which are meaningless outside of a morphosyntactic context, such as the “root” that surfaces as *-ceive* in verbal contexts, and *-cept-* in nominal and adjectival contexts:

(200) a. *deceive* / *deception* / *deceptive*

b. *receive* / *reception* / *receptive*

c. *perceive* / *perception* / *perceptive*

(Adapted from Harley, ibid.(10a,11a))

These “roots” show both identical contextual allomorphy (*-ceive* ~ *-cept-*) and morphological selectional restrictions (*-ion* ~ *-ive*) regardless of the lexical item they are part of. Thus Harley concludes that “[d]espite their semantical[l]y underdetermined nature, these are clearly diagnosable as **root elements** of English by an acquiring child or linguist” (ibid.:240; my emphasis).

I agree that the systematic relationship between these forms is undeniable, and may plausibly aid in their acquisition, in a similar way as mastery of *sing* ~ *sang* ~ *sung* may aid in the acquisition of *ring* ~ *rang* ~ *rung*. However, Harley claims that “the *ceive* ~ *cept* alternation is a property of the *-ceive* **root** itself, which is why it behave[s] the same way across lexical items” (ibid.:240; my emphasis), a claim that I think theoretically is poorly defined with respect to the theoretical constructs mentioned earlier, and is empirically simply not accurate. I take these up in turn.

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“pressed” layers of compacted stone in tar, and that pickles (even today) are “pressed” while immersed in brine. This fact, while interesting, is not relevant to the synchronic grammar.

As with the Semitic examples above, the theoretical problem here concerns Harley's loose use of the terms "root" and "root element."<sup>197</sup> She seems to be claiming that *ceive* ~ *cept* is an N-Root, that is, a Root-as-node. However, *ceive* ~ *cept* are phonological forms, not abstract morphemes; again, by hypothesis, abstract morphemes do not have phonological forms. So then the claim becomes something like "*ceive* ~ *cept* are E-Roots corresponding to a single N-Root," with the actual exponent varying based on how this N-Root is licensed in the syntax (i.e., realized as *-ceive* in verbal contexts and *-cept* in nominal and adjectival contexts).<sup>198</sup>

But what leads us to think these E-Roots correspond to a single N-Root, or that *-ceive* and *-cept-* are E-Roots at all, as opposed to merely *parts* of E-Roots? It's true that the phonological sequence *-cept-* (i.e., [sept]) is meaningless outside of the context of Vocabulary items such as *receptive*, *perceptive*, and so on; normally, this would be an argument that it is *not* a synchronic root.<sup>199</sup> The only reason to treat this putative root as an individuated entity of any kind is its identical phonological alternation in different contexts (*-ceive* in verbs, *-cept* in nouns and adjectives) and its identical selectional restrictions (*-ive* in adjectives, *-ion* in nouns) across those contexts.

However, if we want to admit every phonological sequence that appears to have identical selection restrictions as a synchronic root, we quickly run into problems.

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<sup>197</sup> I should stress that Harley herself points out the confusion over the term *Root* in early Distributed Morphology, citing Acquaviva's (2008) distinction between Roots-as-nodes and Roots-as-exponents in her fn. 4. Given this recognition of the problem, it's not clear why she doesn't carry this distinction forward in the rest of the article.

<sup>198</sup> Another interpretation would be that *-ceive* [siv] and *-cept-* [sept] are synchronic allomorphs of the same E-Root. Given that all they have in common phonologically is [s], this seems unlikely; see fn. 188 above, and Haugen and Siddiqi (2013:§2.1).

<sup>199</sup> Even so-called cran-morphs such as *cran-* in *cranberry* have some inherent meaning, here identifying the type of berry.

Consider the sequence *-en-* (i.e., [in]) in *renal*, *venal*, and *penal*. In both cases, we have what seem to be identical morphological selectional restrictions, with *-en-* selecting for *-al*, just as *-cept* selects for *-ive* in *receptive* and *perceptive*. What is the difference between these cases? Only our knowledge as linguists (or informed laypersons) that the *-cept-* in *receptive* and *perceptive* is diachronically the same element (i.e., a *root* in the etymological sense), and that the *-en-* in *renal* and *penal* is not. In neither case, however, do we need to represent this in the synchronic grammar.

As mentioned above, Harley's empirical claim on this matter faces difficulties, as well; neither the morphophonological alternation (the *-ceive* or *-cept-* form) nor the morphological selectional restrictions are consistent beyond the *perceive*, *deceive*, and *receive* word families, as I illustrate in Table 5:

*Table 5: Realizations of the putative -ceive- ~ -cept- "root" in English*

	Verbal (licensed by <i>T/v</i> )	Nominal (licensed by <i>D/n</i> )	Adjectival (licensed by <i>a</i> )
Predicted	<i>perceive</i>	<i>perception</i>	<i>perceptive</i>
Actual	<i>perceive</i>	<i>perception</i>	<i>perceptive</i>
Predicted	<i>deceive</i>	<i>deception</i>	<i>deceptive</i>
Actual	<i>deceive</i>	<i>deception</i>	<i>deceptive</i>
Predicted	<i>receive</i>	<i>reception</i>	<i>receptive</i>
Actual	<i>receive</i>	<i>reception</i>	<i>receptive</i>
Predicted	<i>conceive</i>	<i>conception</i>	* <i>conceptive</i>
Actual	<i>conceive</i>	<i>conception</i>	<i>conceptual</i>

Predicted	<i>*interceive</i>	<i>interception</i>	<i>*interceptive</i>
Actual	<i>intercept</i>	<i>interception</i>	-
Predicted	<i>*acceive</i>	<i>*acception</i>	<i>*acceptive</i>
Actual	<i>accept</i>	<i>acceptance</i>	<i>acceptable</i>
Predicted	<i>*susceive</i>	<i>susception</i>	<i>susceptive</i>
Actual	-	<i>susception</i>	<i>susceptive</i> <sup>200</sup>
Predicted	<i>*exceive</i>	<i>exception</i>	<i>*exceptive</i>
Actual	<i>except</i>	<i>exception</i>	<i>exceptional</i>

What Table 5 looks like to me is not a synchronically regular morphological pattern built on a bound root, but rather nothing more than diachronic detritus, the remnants of a once-regular system which no longer reflects anything having to do with synchronic word-formation.

On this basis, therefore, I conclude that Harley's arguments on the basis of Semitic morphology and etymological roots in English are insufficient to establish the existence of N-Roots that cannot be semantically individuated in the syntax. In the next section, I consider some bigger picture objections to Harley's model.

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<sup>200</sup> Although this form apparently does exist, *susceptible* seems to be much more common.

#### 4.3.6 Psycholinguistic evidence for late insertion and semantically individuated roots

Labelle (2014), in a direct response to Harley (2014), raises the question of whether and how the conceptual-intentional (CI) system is involved in the selection of N-Roots (Roots-as-nodes) at Numeration:

If atomic roots [N-Roots] do not enter the numeration on the basis of their semantic specification, on what basis do they enter it? What determines which roots are selected. . . if at the time of their selection they are not semantically individuated? (Labelle, 2014:402).

In versions of DM such as Harley (2014), as we have seen, N-Roots are individuated neither phonologically nor semantically in narrow syntax; only after SPELLOUT are phonological and semantic representations attached to an N-Root, at the levels of Phonological Form (PF) and Logical Form (LF), respectively. The N-Roots are instead individuated in the syntax by an abstract index, conventionally represented by an arbitrary number, e.g.  $\sqrt{729}$ . At the LF level, model-theoretic representations in the Encyclopedia are consulted in order to interpret the N-Roots. At PF, Vocabulary items consisting of a phonological exponent and a set of instructions are inserted into the derivation.

The question becomes, then, at which point does the C-I system, representing a speaker's communicative intent, come into play? In more traditional models, this happens at the point at which lexical items are chosen, either at the level of D-structure or (in the Minimalist Program) at Numeration. However, if N-Roots are not semantically

individuated, the C-I system has nothing to work with at Numeration. Perhaps, then, the C-I system is involved only at the level of LF, choosing to insert, say, *chair* or *sofa* into a [+COUNT] N-Root. However, what then drives the initial selection of an N-Root that is [+COUNT] rather than [-COUNT]? Or what if the speaker wants to utter a passive sentence, so as to obscure the role of the Agent? (E.g., as in Ronald Reagan's *Mistakes were made*.) Clearly, such a decision must happen *before* syntax; sentences cannot be retroactively passivized.

Pfau (2009) points out a further problem with any model in which semantically undifferentiated N-Roots are processed by the syntax:

[A]t the point of spell-out, the PF component must 'know' which root a particular terminal node contains; otherwise Vocabulary insertion would proceed at random. In a sentence like "The cat is eating". . . the slot of "cat" might as well be taken by "dog", "fish", or "porcupine" etc. since at the point of Vocabulary insertion, there is no distinction whatsoever between those items with respect to the features which determine the insertion of one or the other item (ibid.:84).

In addition, at LF, the Encyclopedia must also have access to information about which Vocabulary item expones which N-Root, otherwise semantic interpretation would proceed at random. That is, even if the correct Vocabulary item were inserted, the wrong interpretation may result. Nothing in this system prevents a sentence like (201) from being interpreted as indicated:



(201) The dog licked your tacos.

‘the cat nudged your enchiladas’

The only way to avoid this in a system with roots that are semantically undifferentiated in the syntax is if LF and PF have access to each other’s information, something which would seem to contradict Minimalist conceptions of language, in which the C-I and sensorimotor (S-M) systems are connected only by virtue of the syntax. On the other hand, if N-Roots are semantically individuated, the C-I and SM systems both have the information they need in order to operate, as the input in both cases is identical.

Labelle (2014:402) concludes that the C-I system is involved in selecting the numeration, “viewed as a set of atomic roots and bundles of features chosen for their capacity to give rise to a construction reflecting an intended meaning.” These roots (N-Roots in our terms here) are chosen on the basis of their conceptual content, which remains attached to these roots throughout the course of the derivation. LF retains its familiar role: “to calculate the interpretation of the clause[,] taking into account the meaning of the roots and that of the structure” (ibid.:402).

Under this view, N-Roots are semantically individuated in the syntax, then, contra Harley (2014). Labelle finds Harley’s arguments that N-Roots are not phonologically individuated, on the other hand, to be convincing, noting that when combined with semantically individuated N-Roots, this model dovetails with Levelt’s psycholinguistic model of sentence production (Levelt, 1989; Bock & Levelt, 1994).<sup>201</sup> The first stage of Levelt’s model is *functional processing*, the activation and selection of a set of lemmas,

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<sup>201</sup> Pfau (2009:§4.2.1) makes this point as well.

or abstract conceptual forms, to which grammatical information is attached; this stage corresponds to the selection of contentful N-Roots at Numeration. The next level is *positional processing*, corresponding to narrow syntax; this is where lemmas (~N-Roots) are inserted into syntactic frames. The third stage is the *phonological encoding level*, where lexemes, corresponding to Vocabulary items, are retrieved, and where phonological adjustments take place before being sent to the articulatory component.<sup>202</sup>

Pfau (2009) comes to a similar conclusion: “[W]e need to assume that semantic/conceptual features are available at a very early point in the derivation in order to guide the choice of elements” at the level of Numeration; these elements contain not only features relevant to the syntax, but also “the formal concepts that will later be interpreted by the Encyclopedia” (ibid.:85).<sup>203</sup> Pfau bases these conclusions not merely on theory-internal considerations as we’ve been focused on here, but also on studies of speech errors. He reports on the following semantic substitution errors in German (from the Frankfurt corpus of speech errors):

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<sup>202</sup> As Labelle notes (fn. 1), there are of course differences between this view of the model of the grammar and Levelt’s production model, e.g., the latter has no equivalent to LF.

<sup>203</sup> Pfau actually argues that N-Roots “bear indices according to what lexical concept they refer to,” but do not actually carry their semantic features through the syntax. Rather, they are activated on the basis of their meaning, and once activated are selected for Numeration: “The selection mechanism, however, only sees activation but is blind towards the semantics of the roots it selects. I maintain, with DM, that semantic features do not enter the computational system because they do not play any role within that system” (ibid.:90-91). If the syntax does not interact with these features, however, it would be difficult to determine whether they *carry* their semantic features or are merely *indexed* for such features. Both notions, it seems to me, have the same practical effect, and both are of course merely metaphorical with respect to how the brain works.

- (202) a. *Hast du einen Radiergummi da?* ← *einen Spitzer*  
 have you an eraser[MASC] there ← a pencil.sharpener[MASC]  
*Intended:* ‘Do you have a pencil sharpener?’
- b. *In welcher Höhe — äh, Tiefe — haben sie gegraben?*  
 in what.f height[FEM], er, depth[FEM] have they dig  
*Intended:* ‘In what depth did they dig?’
- c. *Damit kommst du auf keinen grünen Baum* ← *grünen Zweig*  
 with.that come you on no green tree[MASC] ← green branch[MASC]  
*Intended:* ‘With that you’ll never get anywhere.’<sup>204</sup>
- d. *Ich habe keine Tafel mehr* ← *keine Kreide*  
 I have no blackboard[FEM] anymore ← no chalk[FEM]  
*Intended:* ‘I have no more chalk.’

(Adapted from Pfau, 2009:Chap. 4(3a-d))

In all these speech errors, the substituted noun is semantically related to the intended noun. In (202a), the nouns are *cohyponyms*, with both belonging to the class of tools related to writing; in (202b), on the other hand, the nouns are antonyms. In (202c), we have an interesting case where part of an idiom is recalled incorrectly, with *Baum* being substituted for *Zweig*.<sup>205</sup> Finally, in (202d), the noun that is substituted for *Kreide* ‘chalk’ is related in an associative manner, as chalk is generally used only on blackboards.

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<sup>204</sup> The German idiom *auf keinen grünen Zweig kommen* means something like ‘to get nowhere, to accomplish nothing’.

<sup>205</sup> This may appear at first glance to be counterevidence for the Principle of Semantic Inertness laid out in Chapter 2 of this dissertation. However, there is no evidence here that the *meaning* of *Baum* is involved in the derivation in any sense; rather, I see this as evidence for how the

Given that the substituted noun in all these errors is semantically related to the intended noun, it seems that activation of the semantic features of the intended noun must occur prior to the speaker accessing their phonological forms. In other words, the semantic representations must play a role in choosing the correct Vocabulary item; otherwise, the substitutions would proceed at random.

Another thing to note about the above speech errors is that in every case, the substituted noun is of the same grammatical gender as the intended noun. This is known as the *identical gender effect*, and although only a probabilistic effect, it appears to be present crosslinguistically. Pfau (ibid.:§5.1.2.2) cites corpus studies on German by Berg (1992) and Marx (1999) putting this effect far above the level of chance, with Berg finding that 67.4% of errors showed such an effect, and Marx finding 79.2%; Pfau's own study puts it at 74.1%. In Spanish, the figure is as high as 95% (Vigliocco, Vinson, Martin, & Garret, 1999), perhaps due to a reduced number of genders in Spanish (two instead of three).

The very existence of such a phenomenon suggests that syntactic features are accessed separately from phonology. If N-Roots are inserted along with their phonological forms prior to syntax, as other models predict, one would expect no influence from the gender of the intended word on the gender of the substituted word. In such a model, a German speaker who is searching for *der Spitzer* 'the pencil sharpener' but fails to access its lexical entry would be equally likely to substitute it with the neuter *das Papier* 'the paper' as masculine *der Radiergummi* 'the eraser'. The identical gender

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phonological component of the lexicon is organized: if a component of an idiom is not found in an initial search, a secondary process whereby a form which is semantically similar is substituted. I admit, though, that the questions raised by such speech errors for my account of idioms deserve further investigation, one that may have to wait for another venue.

effect suggests that syntactic features such as grammatical gender are accessed at a different point in language production than are phonological forms—exactly what a late insertion model would predict.

Further psycholinguistic evidence for late insertion comes from *tip-of-the-tongue* (*TotT*) states, which most of us have experienced at one time or another. ToTs are usually isolated instances in which speakers are unable to come up with the phonological form of a word, despite a strong subjective sense that they are *almost* able to access it. When persistent, the same phenomenon is characteristic of the clinical condition known as anomia, in which patients cannot name an ostended object, but are able to describe the object indirectly, identify what it's used for, etc. (Rohrer et al., 2008). TotT states are likewise characterized by a sense that (to repurpose Donald Rumsfeld's famous distinction) the word a speaker is seeking is a "known unknown", as opposed to an "unknown unknown"; in a TotT state, one knows that they know the word, and as in anomia, can often describe it indirectly.

Tip-of-the-tongue states can be studied in the lab, given the right conditions. In one such study, Biedermann, Ruh, Nickels, and Coltheart (2008) elicited TotT states by providing subjects with brief definitions of English words, and asking them to write down the word that best matched the definition. If subjects were unable to come up with the word, they were asked whether they were in a TotT state, or just didn't know the word at all; either way, they were asked to guess which sentence context the word might fit in, by choosing one context from each of the following pairs:

- (203) a. *There is* \_\_\_\_\_? or *There is a* \_\_\_\_\_?  
 b. *There won't be many* \_\_\_\_\_? or *There won't be much* \_\_\_\_\_?  
 c. *There are a few* \_\_\_\_\_? or *There is some* \_\_\_\_\_?

After each TotT state, the researchers would present the correct word, and ask subjects if it was the word they were thinking of. If it was, this was counted as a *positive TotT state*; if not, it was counted as a *negative TotT state*. Across a total of about 2,450 trials, 104 responses (4.3%) were counted as positive TotT states.

The sentence context questions, of course, functioned as an indirect assessment of whether mass/count features were available in the absence of phonological retrieval. Compared to the condition in which the subjects claimed not to know the word at all, i.e., the “don’t know” state, subjects who reported a positive TotT state were significantly more successful in choosing the correct sentence context. The fact that speakers seem to be able to retrieve some morphosyntactic features about words without accessing their phonological forms suggests the predicted dislocation between these two aspects of lexical access.

Given the considerations in this section with respect to the role of the C-I system in Numeration, the Minimalist assumption that the levels of Logical Form and Phonological Form interface only via the syntax, and the behavioral evidence suggesting the dislocation of morphosyntactic and semantic features from phonological forms, I conclude that a psycholinguistically grounded model of sentence generation requires both late phonological insertion and semantically individuated Roots-as-nodes.

#### *4.3.7 Conclusion*

In §4.3, I've reviewed the model of the grammar known as Distributed Morphology at some length, first describing in §4.3.1-2 the theory as originally proposed in Halle and Marantz (1993) and further articulated in Halle (1997) and Marantz (1995, 1997), and then in §4.3.3-5 considering later revisions, including Embick's (2000) arguments for the early insertion of Roots (i.e., lexical morphemes) and Harley's (2014) arguments that Roots are semantically undifferentiated in the syntax. Finally, I have provided arguments against the latter two positions, concluding with Labelle (2014) and Pfau (2009) that the conceptual-intentional system is involved early in sentence generation, specifically in selecting concepts for the computational component to process, and that phonological exponents are added only after syntax is complete. In the next section, I return to the question of how to account for the constraints on syntactic mobility and semantic co-occurrence on phrasal idioms described in Chapters 2 and 3, and characterize in full the model of lexical insertion that I argue for in this dissertation.

#### *4.4 A psycholinguistically grounded model of lexical insertion*

It should perhaps be clear by now that I do not intend to adopt the model of Distributed Morphology wholesale here, but that I believe that its key insight that the computational component of the grammar forms the input to phonological insertion, not the other way around, is essential for both theory-internal and theory-external reasons. In this section, I focus on how assuming postsyntactic phonological insertion accounts directly for the

observed constraints on idioms discussed in Chapters 2 and 3. First, I will briefly sketch out the model of the grammar I am proposing.

In the account I propose here, the Conceptual-Intentional (C-I) system first forms a communicative intent at the level that in Levelt's model of sentence production (Levelt, 1989; Bock & Levelt, 1994) is referred to as *functional processing*. This communicative intent guides the selection of N-Roots and functional morphemes from List 1, what we might call the *Root Lexicon*; this is a semantically organized list of abstract roots with syntactic and semantic features.<sup>206</sup>

The initial array of N-Roots forms the Numeration; the N-Roots here are then introduced into a derivation by iterative Merge. This is the first part of the syntax-lexicon interface, whereby individual semantic concepts together with syntactic features drive the construction of a syntactic object. To differentiate the insertion of N-Roots from that of the phonological exponents of E-Roots, I refer to this stage of the derivation as *Root Insertion*, or *R-Insertion*. The procedure by which this is accomplished is equivalent to Chomsky's External Merge, and is interspersed with applications of Internal Merge, whereby parts of the derivation under construction are remerged in a higher structural position. I formulate Root Insertion as follows:

- (204) *Root Insertion (R-Insertion)*: The level of the derivation at which abstract Roots-as-nodes are introduced into a syntactic object by External Merge.

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<sup>206</sup> I assume here that these roots come into the syntax with categorical features, i.e., as N, V, etc., although I believe the model I propose is compatible with a categorical licensing account, as in most versions of DM (see §4.3.2 above).



Once the Numeration is exhausted, the syntactic object created by Merge is transferred to the interfaces with the C-I and S-M (sensorimotor) systems for interpretation and what in Distributed Morphology (DM) is referred to as Vocabulary insertion. The latter interface I refer to as Phonological Form, and the procedure by which Vocabulary items are inserted as Phonological Insertion:

- (205) *Phonological Insertion (P-Insertion)*: The level of the derivation at which the phonological forms associated with Roots-as-exponents are introduced into a syntactic object via syntactic and semantic feature-mapping.

P-Insertion represents the second component of the syntax-lexicon interface; the difference here is in the nature of the lexical items accessed. I discuss this process below.

#### 4.4.1 *Semantic feature mapping between N-Roots and E-Roots*

In this section, I demonstrate how the insertion of Vocabulary items proceeds on the basis of morphosyntactic and semantic feature mapping between N-Roots and E-Roots at the interface. For functional morphemes, this can generally be accomplished with respect to morphosyntactic features only, such that in (206) and (207) the features [+/-DEFINITE] and [+/-PLURAL] suffice to account for the distribution of *the*, *a*, and *some*.<sup>207</sup>

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<sup>207</sup> I leave out vP and AspP here for ease of representation. Note that I don't intend for this to be complete; one might want to use a [+/- DEICTIC] feature to distinguish between *the dogs* and *these/those dogs*, a [+/- DISTAL] feature to distinguish between *these* and *those*, etc.

- (206) a. [TP [DP [D  $\sqrt{+DEF, -PL}$ ] [NP [N  $\sqrt{DOG-PL}$ ]] [T  $\sqrt{+PAST}$ ] [VP [V  $\sqrt{BARK}$ ]]]  
 $\rightarrow$  *The dog barked.*
- b. [TP [DP [D  $\sqrt{+DEF, +PL}$ ] [NP [N  $\sqrt{DOG+PL}$ ]] [T  $\sqrt{+PAST}$ ] [VP [V  $\sqrt{BARK}$ ]]]  
 $\rightarrow$  *The dogs barked.*
- (207) a. [TP [DP [D  $\sqrt{-DEF, -PL}$ ] [NP [N  $\sqrt{DOG-PL}$ ]] [T  $\sqrt{+PAST}$ ] [VP [V  $\sqrt{BARK}$ ]]]  
 $\rightarrow$  *A dog barked.*
- b. [TP [DP [D  $\sqrt{-DEF, +PL}$ ] [NP [N  $\sqrt{DOG+PL}$ ]] [T  $\sqrt{+PAST}$ ] [VP [V  $\sqrt{BARK}$ ]]]  
 $\rightarrow$  *Some dogs barked.*

For the lexical morpheme  $\sqrt{DOG}$ , however, morphosyntactic features cannot exhaustively identify the range of possible exponents (in addition to *dog*, possible exponents include *canine*, *puppy*, *hound*, etc.), and so semantic features of some sort are needed in order to ensure that *dog* or *canine*, and not *cat* or *marmoset*, is inserted into  $\sqrt{DOG}$ . Whether or not the relevant semantics can actually be decomposed into distinctive features, I leave open, but whatever it is that distinguishes a dog from a cat conceptually is what we want to indicate here; for the sake of exposition, I will assume that we can capture this with a feature such as [+/-CANINE].

We might begin to construct a partial lexical representation for the Vocabulary item *dog* as in (208). Here,  $M_1$  represents the semantic features that an N-Root must possess in order for it to be expounded by *dog*:

(208) M<sub>1</sub>: ‘dog’ [+CANINE]

PF: *dog* [i.e., /dag/]

SYN: Noun [+COUNT]

A lexical representation such as that in (208) is an E-Root, i.e., a Root-as-exponent. The N-Root into which it is inserted must have compatible semantic features, so that if an E-Root is more specified than the N-Root, its insertion is blocked. For example, if I see a poodle on the street, I can say *That’s an adorable poodle* or *That’s an adorable dog*, but not *\*That’s an adorable hound*. This is because *hound* can only be used to refer to a dog whose ancestors were bred for hunting, such as a beagle or dachshund.<sup>208</sup> The lexical representation for *hound* must therefore be something like (209), and *poodle* something like (210):

(209) M<sub>1</sub>: ‘dog’ [+CANINE] [+HUNTING BREED]

PF: *hound* [i.e., /hʌund/]

SYN: Noun [+COUNT]

(210) M<sub>1</sub>: ‘dog’ [+CANINE] [-HUNTING BREED]

PF: *poodle* [i.e., /pudəl/]

SYN: Noun [+COUNT]

These considerations suggest that N-Roots may be chosen at Numeration with any number of features, including features such as [+/-HUNTING BREED], but may also be

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<sup>208</sup> Idiolectal variation in this is of course to be expected; some speakers may use *hound* to refer to any breed of dog. I myself (being a cat person) was unaware of the distinction until just now.

inserted unspecified for such features, whether because they're inapplicable (as this feature would be for  $\sqrt{\text{GOLDFISH}}$ ), or because the communicative intent is such that a broad class of entities is to be referred to. In (211), I list three N-Roots and their possible exponents:

(211) a.  $\sqrt{\text{DOG}}$  [+COUNT] [+CANINE] [-HUNTING BREED]

→ *dog, poodle, \*hound*

b.  $\sqrt{\text{DOG}}$  [+COUNT] [+CANINE] [+HUNTING BREED]

→ *dog, hound, \*poodle*

c.  $\sqrt{\text{DOG}}$  [+COUNT] [+CANINE]

→ *dog, \*poodle, \*hound*

There are a few things to note about the N-Roots in (211). First, the name of the N-Root, here  $\sqrt{\text{DOG}}$ , is merely an orthographical shorthand for a semantic representation partially composed of the features [+/-CANINE] and [+/-HUNTING BREED]; it is not meant to indicate that the phonological string /dag/ is in any sense part of the N-Root. The exponents I list for each N-Root (for (209a), *dog* and *poodle*) are likewise not part of the N-Root; they are merely possible phonological exponents of the N-Root, i.e., they are E-Roots.

Finally, I do not intend this to be anything like a complete or accurate lexical semantics for either *dog*, *poodle*, or *hound*; indeed, (211a) is incomplete on its face, as one cannot use *poodle* for any non-hunting breed, e.g., one cannot refer to a chihuahua as a *poodle*. However, I think it is possible in principle to construct a semantic representation of some sort for an E-Root that governs which N-Roots it can expone.

Although the semantic features of the individual N-Roots above are sufficient to derive the constraints on the insertion of E-Roots such as *dog*, there are apparent contextual constraints on the insertion of E-Roots, as well. For example, a telic verb cannot be inserted into an environment with atelic modifiers, as in (120a) above (repeated here as (212):

(212) John noticed the snake for hours.

‘John noticed the same snake repeatedly over a period of hours’

\*‘John noticed a snake once for a period of hours’

Note that a derived series-of-identical-events (SIE) is possible here, as indicated in the first reading in (212).<sup>209</sup> Under the single-event interpretation, however, we get an ungrammatical result. I argued in Chapter 3 that this is due to the incompatibility of the [+Telic] feature on verbs like *notice* with the atelic adverbial *for hours*, which requires an inner aspect head  $Asp^0$  which has the feature [-Telic]. In other words, these two elements

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<sup>209</sup> See the discussion of Smith’s derived situation types in §3.2.4 above, as well as the tests for telicity in §3.3.1. MacDonald (2008a) argues that durative adverbials adjoin to vP (or possibly a higher EventP) outside of the domain of aspectual interpretation, which he defines as  $AspP$ ; I assume that under a derived event reading, it adjoins somewhere higher. Note the following:

- |     |   |                              |
|-----|---|------------------------------|
| i.  | a. John jogged yesterday for hours.             | → SIE reading possible       |
|     | b. John jogged for hours yesterday.             | → single event reading only  |
| ii. | a. John noticed the snake yesterday for hours.  | → SIE event reading possible |
|     | b. *John noticed the snake for hours yesterday. | → no single event reading    |

It seems that for the Activity in (i.b) to have a SIE reading (several events of jogging), *for hours* must adjoin higher than *yesterday*; if it adjoins lower, only a single jogging event is involved. In (ii), the SIE event is only available if *for hours* is merged higher, as otherwise it conflicts with [+Telic] *notice*.

require different Aspect heads, and therefore cannot co-occur. When the feature [+Telic] appears on a verbal N-Root, then, it must be inserted concomitantly with an appropriate Aspect head, as I argued in §3.6.2 above. In this way, contextual constraints on the insertion of E-Roots boil down to contextual constraints operating at Numeration, where the Aspect head selected must bear aspectual features that do not conflict with other elements of the Numeration. I formulate this constraint as follows:

- (213) *Principle of Aspectual Compatibility (PAC)*: The N-Roots and functional morphemes chosen at Numeration must have nondistinct aspectual features in order for the derivation to proceed.

For example, the N-Root  $\sqrt{\text{DIE}}$ , which is [+TELIC, +DYNAMIC], can appear in the Numeration with either of two Aspect heads:  $\sqrt{\text{Asp}}_{[\text{TELIC}, \text{DYNAMIC}, \text{DURATIVE}]}$ , or  $\sqrt{\text{Asp}}_{[\text{TELIC}, \text{DYNAMIC}, \text{NONDURATIVE}]}$ , as both are compatible with its inherent aspect. These two choices will correspond to its durative and punctual readings, respectively. For the sentences in (214a) and (215a), the Numeration (of the relevant elements) would be as in (214b) and (215b), resulting in the post-SPELLOUT structures in (214c) and (215c)<sup>210</sup>:

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<sup>210</sup> I assume here that both *slowly* and *at [time]* adverbials are adjoined to VP; they could conceivably be adjoined to AspP or vP, but this is not relevant for present purposes. I assume also that the progressive heads an independent projection above vP, which I label here as ProgP.

(214) a. John died at noon.

b.  $\sqrt{\text{Asp}}_{[\text{TEL}, \text{DYN}, \underline{\text{NDUR}}]} \sqrt{\text{DIE}}_{[\text{TEL}, \text{DYN}]} \sqrt{\text{AT}}_{[\underline{\text{NDUR}}]}$

c.  $[\text{TP} [\text{DP } \textit{John}] [\text{T}' [\text{T}\emptyset] [\text{vP} [\text{v}\emptyset] [\text{AspP} [\text{Asp}\emptyset_{[\text{TEL}, \text{DYN}, \underline{\text{NDUR}}]}] [\text{VP} [\text{v } \textit{died}_{[\text{TEL}, \text{DYN}]}]]]] [\text{PP} [\text{P } \textit{at}_{[\underline{\text{NDUR}}]}] [\text{DP } \textit{noon}]]]]]]]$

(215) a. John was slowly dying.

b.  $\sqrt{\text{BE}}_{[\underline{\text{DUR}}]} \sqrt{\text{Asp}}_{[\text{TEL}, \text{DYN}, \underline{\text{DUR}}]} \sqrt{\text{DIE}}_{[\text{TEL}, \text{DYN}]} \sqrt{\text{SLOWLY}}_{[\underline{\text{DUR}}]}$

c.  $[\text{TP} [\text{DP } \textit{John}] [\text{T}' [\text{T}\emptyset] [\text{ProgP} [\text{Prog } \textit{was}_{[\underline{\text{DUR}}]}] [\text{vP} [\text{v}\emptyset] [\text{AspP} [\text{Asp}\emptyset_{[\text{TEL}, \text{DYN}, \underline{\text{DUR}}]}] [\text{VP} [\text{AdvP} [\text{Adv } \textit{slowly}_{[\underline{\text{DUR}}]}] [\text{v } \textit{dying}_{[\text{TEL}, \text{DYN}]}]]]]]]]]]]]$

Thus in both (214b) and (215b) we have a Numeration for which elements have nondistinct aspectual features. Note that as  $\sqrt{\text{DIE}}$  is not specified for [+/-Durative], it will not conflict with any other elements in this regard, and therefore has both punctual and durative readings; in other words, it can appear in the Numeration with either a punctual or durative Aspect head.

This is not true of its telicity;  $\sqrt{\text{DIE}}$  is inherently telic, and cannot occur with an atelic Aspect head. In (216b), we have a violation of *PAC*, as  $\sqrt{\text{FOR}}$  is [-Telic], but  $\sqrt{\text{DIE}}$  is [+Telic]; no Aspect head exists that can satisfy both elements. Thus (216b) is an impossible Numeration, and so (216a) cannot be derived.

(216) a. \*John died for hours.

b.  $\sqrt{\text{Asp}}? \sqrt{\text{DIE}}_{[\underline{\text{TEL}}, \text{DYN}]} \sqrt{\text{FOR}}_{[\underline{\text{ATEL}}, \text{DUR}]}$

We can therefore posit in (217) the provisional N-Root for  $\sqrt{\text{DIE}}$ , to go along with the E-Root posited for *die* in (167), repeated here as (218):

(217) *N-root for  $\sqrt{\text{DIE}}$  (initial version)*

$\sqrt{\text{DIE}}$  [TELIC, DYNAMIC]

(218) *E-root for die (initial version)*

M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub> [EXPERIENCER]

PF: *die*

SYN: Verb [\_\_PROTO-PATIENT]

However, in a model that assumes postsyntactic phonological insertion, the syntactic features we earlier associated with *die* cannot be a property of an E-Root. The Vocabulary item *die* does not select complements or assign theta roles; these are syntactic and semantic phenomena that occur at R-Insertion, not P-Insertion. They therefore must be the property of the N-Root  $\sqrt{\text{DIE}}$ . Thus we must adjust (217) and (218) as follows:

(217') *N-root for  $\sqrt{\text{DIE}}$  (revised version)*

M<sub>1</sub>:  $\sqrt{\text{DIE}}$  [TELIC, DYNAMIC] [EXPERIENCER]<sup>211</sup>

SYN: Verb [\_\_PROTO-PATIENT]

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<sup>211</sup> The property of “takes an Experiencer” indicated here may be wrapped up in the conceptual structure of  $\sqrt{\text{DIE}}$  to the point where we need not indicate it separately.



(218') *E-root for die (revised version)*

M<sub>1</sub>: 'die' [TELIC, DYNAMIC]

PF: *die*

In updating these lexical representations in this manner, we have cut the final cord that tied these two aspects of 'die' together into one lexical entry.

In this section, I've demonstrated that the apparent syntactic and semantic co-occurrence restrictions on the insertion of phonological exponents such as *die* are actually constraints that hold at Numeration, governing which elements a given N-Root can appear with there. For aspect, this is governed by the Principle of Aspectual Compatibility, whereby N-Roots and functional morphemes must have nondistinct aspectual features in order for a derivation to proceed. Thus  $\sqrt{\text{DIE}}$  cannot appear in a Numeration with other elements which are [-Telic], and as *die* expones  $\sqrt{\text{DIE}}$ , it will therefore never appear with an atelic modifier; this is a second-order constraint, not a constraint on *die* itself but a constraint on the N-Root it expones.

This significantly reduces the complexity of the operation by which E-Roots are inserted, such that it now proceeds in a context-free manner, based only on semantic feature mapping to N-Roots. As I demonstrate in the following section, it will also allow us to incorporate the constraints on idioms observed in Chapters 2 and 3, although with a slight modification necessary in the context of Olsen's (1997) privative features system of aspectual composition.

#### 4.4.2 Postsyntactic insertion and the aspectual properties of phrasal idioms

I will briefly recap here the conclusions of Chapters 2 and 3. In Chapter 2, I demonstrated that the apparent heterogeneity associated with phrasal idiom mobility and interpretation is effectively accounted for in terms of what Newmeyer (1974) referred to as the idiom's  $M_1$  meaning. The syntactic mobility associated with an idiom is precisely the same as that of a carefully elaborated paraphrase of the idiom's  $M_1$ ; this is because it bears the same thematic structure as its  $M_1$ , assigning the same theta roles. In order to observe this correspondence, however, it is necessary to *precisely* identify the components of meaning of an idiom; a mere intuitive paraphrase does not suffice. Only in doing so can we predict whether an idiom's  $M_1$  allows the displacement of its phonological components.

In Chapter 3, I demonstrated that the aspectual properties of idioms are likewise derivable from the semantic representation of the idiom, a precisely parallel result to that achieved in Chapter 2. In incorporating these properties into a monotonic system of aspectual composition, I proposed also that phrasal idioms differ from verbs in that they may lexicalize a greater degree of structure, including the inner aspect projection AspP, with the result that they may be semantically durative or nondurative and telic or atelic, whereas verbs are restricted to either the positive value or to being lexically unspecified for these features.

I will begin by considering the preliminary lexical representations for a handful of idioms as developed in Chapters 2 and 3. *Kick the bucket*, *buy the farm*, and *bite the dust* share the lexical representation in (165), repeated here as (219):

(219) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub> ‘punctually’<sub>[NONDURATIVE]</sub> [EXPERIENCER]

PF: *kick the bucket / bite the dust / buy the farm*

SYN: Asp<sup>0</sup><sub>[TEL, DYN, NDUR]</sub> Verb [\_\_PROTO-PATIENT]

The lexical entries developed for the durative idioms *give up the ghost* and *pass away* were represented as in (166), repeated here as (220):

(220) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub> ‘duratively’<sub>[DURATIVE]</sub> [EXPERIENCER]

PF: *give up the ghost / pass away*

SYN: Asp<sup>0</sup><sub>[TEL, DYN, DUR]</sub> Verb [\_\_PROTO-PATIENT]

In the late insertion model under development in this chapter, however, these cannot be unitary lexical entries. In §4.4.2 above, I argued that the properties of lexical entries which are relevant to the syntax, such as theta role assignment, are properties not of an E-Root, but rather the N-Root, and are irrelevant at the point of Vocabulary insertion. Given this, what are we to make of the claim advanced in §3.6.2 that idiomatic predicates differ from verbal predicates in that they may lexicalize an inner Aspect head? I repeat my claim here:

Perhaps, then, these idioms occupy not only a verbal projection in the syntax, but also an inner aspect projection, AspP, which dominates VP. This would allow us to capture the observation that individual verbs (which head only verbal projections) host only positively marked features, but that idioms may host

negatively marked features, as they may additionally include this aspectual projection (from §3.6.2 of this dissertation).

In the model I am proposing here, idioms are merely phonological exponents of N-Roots, inserted into a structure only at the level of Phonological Form. In a model of lexical insertion which assumes that phonological forms are inserted along with syntactic and semantic features, the proposal that an Aspect head is lexicalized as part of an idiom might make sense; I could argue that an idiom like *kick the bucket* is inserted as a preconstructed syntactic object under an AspP node, with the specific (null) Asp<sup>0</sup> involved part of the syntactic object being inserted. In a late insertion model, however, we are not inserting syntactic heads, we are merely inserting phonological exponents into a structure already fully manipulated by the syntax.

The conclusion that *kick the bucket* requires an Aspect head with the properties [TELIC, DYNAMIC, NONDURATIVE], then, must be reconstrued as a condition on its insertion, precisely identical to the condition that *die* can be inserted only in the context of an Aspect head which is [TELIC, DYNAMIC]. In the previous section, I argued that this boils down to a condition on Numeration, whereby the aspectual features of the N-Roots and functional morphemes selected in a Numeration must have compatible aspectual features; I refer to this as the Principle of Aspectual Compatibility (PAC). Apparent contextual constraints on the insertion of E-Roots, then, are really contextual constraints on the insertion of N-Roots. *Kick the bucket*, then, is limited to insertion into a context in which the relevant aspect head has been inserted, i.e., the one that produces the punctual reading of  $\sqrt{\text{DIE}}$ .

However, we run into another problem here. I am claiming that  $\sqrt{\text{DIE}}$  is unspecified for durativity, and that *kick the bucket* is restricted in that it can only be inserted into a nondurative context. Yet the E-Root  $\sqrt{\text{DIE}}$  that it expones, by hypothesis the only one that matters when it comes to feature-mapping, is not marked for durativity; instead, it is the Aspect head that is marked as [+/-Durative]. This suggests that the E-Root that *kick the bucket* expones must also be marked for durativity.

This apparent paradox arises, however, only from the previous conclusion that because the E-Root *die* is always unmarked for durativity, this means that the N-Root  $\sqrt{\text{DIE}}$  is also. This is not necessarily the case. If we assume that there are two N-Roots  $\sqrt{\text{DIE}}$  that may enter Numeration, one which is durative and one which is nondurative, we can account for the distribution of these idioms directly. The E-Root *die* can be inserted into either one of these N-Roots, but *kick the bucket* and *give up the ghost* can be inserted only into the nondurative and durative N-Roots, respectively. In (221), I list both of these N-Roots along with some of their possible exponents:

- (221) a.  $\sqrt{\text{DIE}}$  [+TELIC] [+DYNAMIC] [-DURATIVE]

SYN: Verb [\_\_PROTO-PATIENT]

→ *die*, *kick the bucket*, \**give up the ghost*

- b.  $\sqrt{\text{DIE}}$  [+TELIC] [+DYNAMIC] [+DURATIVE]

SYN: Verb [\_\_PROTO-PATIENT]

→ *die*, *give up the ghost*, \**kick the bucket*

The situation here is quite similar to that with the three N-Roots  $\sqrt{\text{DOG}}$  in (211) above. We saw that *dog* may be inserted regardless of the feature [+/-HUNTING BREED], but that *hound* may only be inserted if this feature is marked positively, and *poodle* only if it is marked negatively.

The updated E-Root for a punctual idiom such as *kick the bucket* will be as follows (*bite the dust* and *buy the farm* will be the same except for the PF):

(222) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub> ‘punctually’<sub>[NONDURATIVE]</sub>

PF: *kick the bucket*

The E-Root for a durative idiom such as *give up the ghost* will look like (223):

(223) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub> ‘duratively’<sub>[DURATIVE]</sub>

PF: *give up the ghost*

I repeat here also the E-Root for *die* from (218’) as (224) for the purposes of comparison:

(224) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]</sub>

PF: *die*

We are left with one final mystery, however, if we want to maintain the monotonic semantic composition of Olsen’s (1997) privative features model of aspect.<sup>212</sup>

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<sup>212</sup> See §3.2.5 and §3.6 above.

In Chapter 3, I argued with Olsen that although telicity and durativity are semantic features inherent to verbs, atelicity and nondurativity are not; atelic and nondurative readings of verbs arise either from 1) pragmatic implicatures resulting from the verb being unspecified for these features, or 2) the monotonic semantic contributions of other sentential and contextual elements. This does not appear to be the case for phrasal idioms, however, as idioms like *bite the dust* are restricted to punctual interpretations, as they cannot combine with durative elements such as the progressive. My provisional solution was to assume that idioms “lexicalize” a greater degree of structure, including an inner Aspect head. However, this solution cannot be maintained in the context of the system proposed in this chapter; *kick the bucket* cannot be said to have an Aspect head as part of its structure, as the claim “X has an Aspect head” is a syntactic notion, not a semantic one.

Restating the problem, we have E-Roots that are idioms with the semantic feature setting [-Durative], but (if Olsen’s analysis is correct) no nonidiomatic E-Roots with this same semantic feature setting. Why is there no E-Root like *\*die* [-DURATIVE]? Note that although there is also no E-Root like *\*die* [-TELIC], either, this is for entirely different reasons. Such an E-Root would be limited to insertion into the N-Root *\*√DIE* [-TELIC], but such an N-Root cannot possibly exist, as it would mean something like ‘to die without dying’, i.e., to be engaged in a process of dying without an inherent endpoint. Yet, as we have seen, it is possible for *die* to be interpreted duratively. So we cannot prohibit *\*die* [-DURATIVE] on this basis.

I believe we must look, then, to the nature of idiomaticity itself. Anticipating the discussion in the following section, we will see that the exponents of idioms such as *spill*

*the beans* can have more than one phonological component: *spill* expones the N-Root  $\sqrt{\text{REVEAL}}$ , and *the beans* expones both the functional morpheme and the N-Root in the DP  $\sqrt{+DEF, -PL} \sqrt{\text{SECRET}}$ ; it will be necessary to assume this analysis because of the possibility of inserting *the beans* into a passive structure (e.g., as in *the beans were spilled*). We can call a Vocabulary item like this a *complex E-Root*.

I therefore propose that idioms such as *kick the bucket* and *bite the dust* can be restricted to [-DURATIVE] environments, but a verb like *die* cannot, simply because idioms are necessarily complex E-Roots, with their phonological exponents having multiple components mapped to components of their meaning. Under this view, *kick the bucket* has ‘punctually’ as a component of its meaning, although the phonological exponent which corresponds to this will be phonologically null. The aspect head  $\sqrt{\text{Asp}^0}_{[\text{TELIC, DYNAMIC, NONDURATIVE}]}$  thus has this null component of *kick the bucket* as an exponent, an option not available to *die* because it is not a complex E-Root.

The notion of a phonologically null phonological exponent might seem a contradiction in terms. However, the argument here is that the idiom has a *semantic* component that is not pronounced. If this is the case, one would expect that some language might have a similar component that *is* pronounced.<sup>213</sup> As Comrie (1976:43) notes, Hungarian has a morpheme *-en* which limits a semelfactive to a punctual interpretation, such that while *zör-ög* means ‘knock, possibly repeatedly’, *zörr-en* means ‘knock once only’; in the present system, we might say that Hungarian *-en* is an exponent

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<sup>213</sup> An analogy might be drawn here to how English has no morpheme corresponding to the causative, but other languages (e.g., Japanese, as well as Hungarian) do.



of  $\sqrt{\text{Asp}}^0_{[\text{TELIC, DYNAMIC, NONDURATIVE}]}$ .<sup>214</sup> I am essentially arguing here that idioms like *kick the bucket* have this same semantic component, but that its exponent is not pronounced.<sup>215</sup>

With the addition of the null component that expones  $\sqrt{\text{Asp}}_{[-\text{DURATIVE}]}$ , the E-Root for *kick the bucket* will now look like that in (225):

- (225)  $M_1$ : ‘die’<sub>[\text{TELIC, DYNAMIC}]\_a</sub> ‘punctually’<sub>[\text{NONDURATIVE}]\_b</sub>  
 PF: [*kick the bucket*]<sub>a</sub>    [∅]<sub>b</sub>

In (225), I indicate the mapping between the idiom’s phonological and semantic components via the indices on these components.

In implementing this proposal, we are now finally in a position to define a word that has appeared 733 times so far in this dissertation: *idiom*. The provisional definition from Chapter 1 was as in (17), repeated here as (226):

- (226) *Idiom*: A combination of independently listed lexical items listed redundantly in the lexicon, whose meaning is not entirely a function of the independently listed meanings of these items.

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<sup>214</sup> For more on Hungarian semelfactives, see Kiss (2011), who argues that punctual semelfactives in Hungarian are derived.

<sup>215</sup> A second, more serious objection to this conclusion is that it’s a “just-so” stipulation or a case of circular reasoning; the idiom has a punctual semantic component because the theory needs it to. Given that my claim that *kick the bucket* has a punctual semantic component is drawn from empirical observations (see §3.4.3 above), I don’t believe this to be the case, but I will return to this objection when I discuss the limitations of this dissertation in Chapter 6.

The revised definition is as in (227):

- (227) *Idiom*: A complex Root-as-exponent (E-Root), with one or more semantic components corresponding to one or more components of its phonological exponent, some of which may be inserted noncontiguously but all of which must be inserted simultaneously.

I will expand upon this in the next section. For now, note that identifying *kick the bucket* as a complex E-Root allows us to claim that it has a semantic feature that cannot be a property of a simple verbal E-Root, i.e., that it can be semantically nondurative. Thus the original conclusion of §3.6 that an idiom may “lexicalize an inner Aspect head” can be restated in the current framework, in which an idiom is a complex E-Root, one of whose components expones an inner Aspect head.

#### 4.4.3 *Noncontiguous insertion of the components of phrasal idioms*

In the previous section, I discussed how to implement the conclusions of Chapter 3 in the late insertion model I am proposing in this chapter. Here I will discuss how to implement the conclusion of Chapter 2 that the variation in phrasal idiom mobility is effectively accounted for by a careful elaboration of the  $M_1$  semantic representation of the idiom. I argued there that the syntactic mobility associated with an idiom is precisely the same as that of a carefully elaborated paraphrase of the idiom’s  $M_1$ ; this is because it bears the

same thematic structure as its  $M_1$ , assigning the same theta roles, and that for syntactic purposes, its components are therefore available for the same operations.

In the model I propose here, the question of syntactic immobility must be rephrased; the question will be instead as follows: into which syntactic structures can the E-Roots represented by these idioms be P-Inserted? Recall that the observation that motivated Chapter 2 was that *kick the bucket* does not retain its idiomatic interpretation when *the bucket* is displaced, as in a passive sentence, but *spill the beans* does. I repeat the relevant data from (25-26) as (228-229):

- (228) a. [ID/LIT] Mary spilled the beans.
- b. [ID/LIT] The beans were spilled by Mary.
- c. [ID/LIT] Mary's spilling of the beans was unfortunate.
- d. [ID/LIT] The beans that Mary spilled will doom us all.
- (229) a. [ID/LIT] John kicked the bucket last night.
- b. [\*ID/LIT] The bucket was kicked by John this morning.
- c. [\*ID/LIT] John's kicking of the bucket was unfortunate.
- d. [\*ID/LIT] The bucket that John kicked involved much suffering.

As I discussed in the previous section, the idiom *kick the bucket* is an E-Root, that is, a Root-as-exponent, and is one of multiple possible exponents of the N-Root in (221a), repeated here as (230):

(230)  $M_1$ :  $\sqrt{\text{DIE}}$  [+TELIC] [+DYNAMIC] [-DURATIVE]

SYN: Verb [\_\_\_PROTO-PATIENT]

→ *die, kick the bucket, bite the dust, \*give up the ghost*<sup>216</sup>

Note that due to the nature of its syntactic representation, the N-Root in (230) cannot appear in a passive structure. The reason for this is that the relevant syntactic head,  $\sqrt{[+PASSIVE]}$ , is incompatible with unaccusatives such as  $\sqrt{\text{DIE}}$ , as the passive involves suppression of an external theta role, and  $\sqrt{\text{DIE}}$  has no external theta role to suppress.

Consider now the lexical representation of the E-Root *kick the bucket* in (225), repeated here as (231):

(231)  $M_1$ : ‘die’<sub>[TELIC, DYNAMIC]<sub>a</sub></sub> ‘punctually’<sub>[NONDURATIVE]<sub>b</sub></sub>

PF: [*kick the bucket*]<sub>a</sub> [Ø]<sub>b</sub>

*Kick the bucket* can only be inserted into an N-Root with the meaning ‘die’, viz.,  $\sqrt{\text{DIE}}$ .<sup>217</sup>

It will therefore never be inserted into a passive structure, as  $\sqrt{\text{DIE}}$  will never appear in a passive structure. Thus, the explanation for the infelicity of (229b) above is quite straightforward in this model, and falls out directly from 1) the thematic structure of the N-Root, and 2) the semantic-mapping component of the E-Root. A precisely parallel explanation is available for (229d), where we have the relativized structure *the bucket that was kicked*. Relativization is a syntactic process, one for which the N-Root  $\sqrt{\text{DIE}}$

<sup>216</sup> *Give up the ghost* is (for some speakers) impossible here because its E-Root is durative.

<sup>217</sup> The component that means ‘punctually’, which is phonologically null, is inserted into  $\sqrt{\text{Asp}^0}$ , as discussed in the previous section.

does not meet the structural description, which again requires the displacement of an internal argument.

The case of (229c), however, will require an extra step. I repeat it here as (232a):

- (232) a. [\*ID/LIT] John's kicking **of** the bucket was unfortunate.  
 b. John's dying was unfortunate.

At first glance, it appears as if  $\sqrt{\text{DIE}}$ , as exponed by *die*, can appear in an environment in which *kick the bucket* cannot (232b). However, this is an illusion. The sentence in (232a) is an *action nominalization*, as indicated by the preposition *of*, whereas the sentence in (232b) is a *gerundive nominalization*. I find the gerundive nominalization in (233) at least marginally acceptable with the idiomatic interpretation<sup>218</sup>:

- (233) [?ID/LIT] John's kicking the bucket was unfortunate.<sup>219</sup>

To the extent that a difference in acceptability between (232a) and (233) exists, I think it's due to another constraint on the insertion of an idiom like *kick the bucket*: the phonological words *kick*, *the*, and *bucket* must be inserted into a single N-Root, i.e., they must be inserted contiguously into  $\sqrt{\text{DIE}}$  as follows:

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<sup>218</sup> Fraser (1970) lists action nominalization as a much more “disruptive” transformation than gerundive nominalization; idioms that accept the latter are marked only at L2 or above, whereas idioms that accept the former are marked at L5 or above. See §2.2.3 above.

<sup>219</sup> Since the idiom is exponing a noun here, this example could be adduced as evidence that N-Roots enter a derivation without categorical features, as in some versions of DM; see §4.3.2.

(234)  $\sqrt{\text{DIE}} \rightarrow \text{kick the bucket}$

How is it, then, that *spill the beans* can appear in the passivized, action-nominalized, and relativized sentences where *kick the bucket* cannot? It seems that it has components that can be inserted noncontiguously, into separate N-Roots. Indeed, I see no difference in the following:

- (235) a. [ID/LIT] John's spilling of the beans was unfortunate.  
 b. [ID/LIT] John's spilling the beans was unfortunate.

The fact that the phonological components of *spill the beans* can be inserted noncontiguously, but that the phonological components of *kick the bucket* cannot, is due to the former idiom being, in Nunberg, Sag, and Wasow's (1994:496-97) terms, an *idiomatically combining expression (ICE)*; these are a class of idioms "whose parts carry identifiable parts of their idiomatic meanings." *Kick the bucket*, on the other hand, is an *idiomatic phrase (IP)*, a class of idioms "whose idiomatic interpretations cannot be distributed over their parts." In the E-Root for *spill the beans* in (236), I indicate this by bracketing the two major components of the idiom, and by indexing which semantic components the phonological components correspond to:

(236)  $M_1$ : 'reveal'<sub>a</sub>    ' $\sqrt{+DEF, -PL}$ '<sub>c</sub>    'secret'<sub>b</sub>  
 PF: [*spill*]<sub>a</sub>    [*the*]<sub>c</sub>    [*beans*]<sub>b</sub>

A Vocabulary item such as that in (236) I refer to as a *complex E-Root*; I assume all idioms are complex E-Roots, in the sense that they have more than one phonological and/or semantic component.

The N-Roots which have (236) as possible exponents include the following:

(237) a.  $\sqrt{\text{REVEAL}}$  [+TELIC] [+DYNAMIC]

    SYN: Verb [PROTO-AGENT\_\_]

    b.  $\sqrt{+_{\text{DEF}}, -\text{PL}}$

    c.  $\sqrt{\text{SECRET}}$ <sup>220</sup>

    SYN: Noun [+COUNT]

The insertion of *spill the beans* is only possible in a structure in which all three N-Roots in (237) are present. Note that the feature [+DEF] on the determiner<sup>221</sup> is part of the idiom, as if the secret revealed is indefinite, insertion of the idiom is blocked:

(238) . . . . [T  $\sqrt{+_{\text{PAST}}}$ ] [VP [V  $\sqrt{\text{REVEAL}}$ ] [DP [D  $\sqrt{+_{\text{INDEF}}, -\text{PL}}$ ] [NP [N  $\sqrt{\text{SECRET}}$ ]]]]]

→ *Mary revealed a secret.*

→ \**Mary spilled the beans.*

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<sup>220</sup> I'm not going to attempt a lexical semantic representation here, but it would presumably include components such as 'information' and 'not widely known'.

<sup>221</sup> Note that although *the beans* appears to be plural, I am assuming that  $\sqrt{\text{SECRET}}$  is not, so that the functional morpheme with which it is R-Inserted is  $+_{\text{DEF}}, -\text{PL}$ . However, *the beans* triggers plural inflection on the passive morpheme, as in *The beans were/\*was spilled*. I assume this can be handled in the phonological component, but other analyses are possible.

In accordance with the definition of *idiom* in (227) above, some of the components of the phonological exponent of an idiom may be inserted noncontiguously, although they must all be inserted simultaneously.<sup>222</sup> This will be indicated in the phonological exponent of an E-Root via bracketing, as in the E-Root for *spill the beans* in (236), repeated in (240) below. For an idiom to have phonological components which can be inserted in this manner, however, it is necessary for it to have a semantic component to which these phonological components correspond directly; this is indicated via the indexing between these two parts of the E-Root. The E-Roots for *kick the bucket* and *spill the beans* from (225) and (236) are repeated here as (239) and (240), respectively:

(239) M<sub>1</sub>: ‘die’<sub>[TELIC, DYNAMIC]a</sub> ‘punctually’<sub>[NONDURATIVE]b</sub>

PF: [*kick the bucket*]<sub>a</sub> [Ø]<sub>b</sub>

(240) M<sub>1</sub>: ‘reveal’<sub>a</sub> ‘√<sub>+DEF, -PL</sub>’<sub>c</sub> ‘secret’<sub>b</sub>

PF: [*spill*]<sub>a</sub> [*the*]<sub>c</sub> [*beans*]<sub>b</sub>

Note that although the bracketing and indexing for *kick the bucket* in (239) is what is formally preventing the insertion of *kick* and *the bucket* into separate N-Roots, this is not merely a notational device meant to block this insertion in an *ad hoc* manner. It falls out directly from the semantic representation of the idiom, as ‘die’ does not have separate semantic components that could be possibly be mapped to components of its phonological exponent. Thus the E-Root in (241b) cannot correspond to the nonce idiom

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<sup>222</sup> As mentioned earlier, I am assuming a pre-phase theoretic model here for the sake of exposition, but once phase theory is introduced into the model in Chapter 5, the claim here will become “they must all be inserted within the same phase.”



*punch the bathtub* in (241a), as the indices in the phonological part of the representation cannot be mapped to individual parts of the semantic representation:

- (241) a. *\*punch the bathtub*  
 b. *\*M<sub>1</sub>: ‘die’*<sub>[TELIC, DYNAMIC]</sub> ?  
*\*PF: [punch]<sub>a</sub>      [the]<sub>c</sub>      [bathtub]<sub>b</sub>*

The formalisms I have introduced here are therefore not idiosyncratic features that vary from idiom to idiom regardless of the idiom’s meaning, but rather reflections of the inherent relationships between the semantic representation of an idiom and its phonological components.

#### 4.4.4 Comparisons to other accounts of idioms’ syntactic immobility

This account therefore circumvents some of the problems with other analyses of idioms described in Chapter 2 (e.g., Weinreich, 1969; Katz, 1973; Fraser, 1970), whereby idioms or their components must be idiosyncratically marked for which transformations they can undergo (as in Weinreich), which of their components are idiomatic and thus unavailable for transformations (as in Katz), or what level of a “frozenness hierarchy” they belong to (à la Fraser). It directly incorporates the insights of Newmeyer (1974) with respect to the central role that an idiom’s meaning plays in determining its syntactic behavior,<sup>223</sup> the descriptive taxonomy of Nunberg (1978) and Nunberg, Sag, and Wasow (1994), and

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<sup>223</sup> Indeed, I believe the present work is the first attempt to formalize Newmeyer’s insights with respect to modern views of the grammar.

borrows also from the formal devices introduced in Jackendoff (1997b, 2002), as well as Horn's (2003) focus on the thematic structure of an idiom, claiming that the latter is a property of the N-Root which an idiom expones.

#### 4.5 Conclusion

In this chapter, I've taken an in-depth look at the syntax-lexicon interface from multiple perspectives and in multiple models of the grammar, concluding in the end that this interface is better thought of as *a pair* of interfaces. The first is where the semantic representations of lexical items are inserted, at a stage of the derivation I refer to as Root Insertion (R-Insertion); one might think of this as the *lexical semantics-syntax interface*. The second is where the phonological exponents of lexical items are inserted, at a stage of the derivation I refer to as Phonological Insertion (P-Insertion); one might think of this as the *syntax-lexical phonology interface*, although both morphosyntactic and lexical semantic properties are relevant here for feature mapping.

Building on the conclusions of Chapters 2 and 3 above, in which the  $M_1$  semantic representation of an idiom determines both its thematic structure (and therefore its syntactic mobility) and its aspectual features (and therefore its aspectual co-occurrence restrictions), I have argued that the apparently heterogeneous properties of idiom are directly accounted for via a careful consideration of the role which the semantic representation of an idiom plays at the interfaces. In this model, idiomaticity itself is a property of the second lexical interface only, as idioms differ from literal language only with respect to feature-mapping between the semantic properties of morphemes that have

been processed by the syntax (N-Roots) and the semantic features which are connected to their phonological forms (E-Roots); for idioms, these phonological forms are not necessarily unitary, but rather can be distributed with respect to the semantic features they expone.

Although the question was not considered explicitly until this chapter, Chapters 2, 3, and 4 of this dissertation together constitute an extended argument, on the basis of the properties of phrasal idioms, that the answer to the *timing-of-insertion meta-parameter* discussed in Chapter 1 is as follows: phonological features are inserted at a late stage of a derivation, after syntactic operations are complete, and after the point at which a derivation diverges (as in the standard generative inverted-Y model), with precisely the same representation sent to the interpretive and articulatory components of the grammar. Much research remains to be accomplished in this area, and although the model I propose here is largely consistent with the basic assumptions of Distributed Morphology, significant differences remain with some versions of the latter.

In Chapter 5, I turn to the other meta-parameter discussed in Chapter 1, which I refer to as the *directionality meta-parameter*, or the question of whether syntactic derivations are generated beginning with the most deeply-embedded terminals and building a structure “upwards” via iterative Merge, or rather are generated beginning with the root node of a sentence and proceeding “downward,” building a structure by an operation isomorphic to Merge (save for directionality), an operation which I refer to as *Branch*. I will argue that psycholinguistic considerations strongly suggest that the model of the grammar whereby bottom-up derivations are created by iterative Merge, although quite adequate from a theory-internal perspective, nonetheless cannot be an appropriate

model of real-time sentence generation in the brain. I therefore propose a provisional model wherein structure-building proceeds top-down, with the cyclic transfer to the interfaces associated with Phase Theory (Chomsky, 2001, 2008, etc.), and consider how the two meta-parameter settings I argue for in this dissertation might interact with one another in a single model.

## CHAPTER 5: THE DIRECTIONALITY OF DERIVATIONS

### 5.1 Overview

In Chapter 1, I identified two *meta-parameters* which represent not crosslinguistic variation (as in the usual use of the term *parameter* in generative grammar), but rather variation between possible biological instantiations of formal systems, i.e., between possible versions of Universal Grammar. Implicitly in Chapters 2-3, and explicitly in Chapter 4, I discussed the *timing-of-insertion meta-parameter*, in which phonological forms are either 1) part of the input to the computational component of the grammar, or 2) part of its output, inserted only after (narrow) syntactic processes are complete; in Chapter 4, I argued that the latter must be the case. In this chapter, I turn briefly to the other meta-parameter, which I refer to as the *directionality meta-parameter*, which concerns the question of whether syntactic structures are built incrementally beginning with the most deeply embedded terminals, i.e., from the bottom-up, or beginning with the root node of a sentence, i.e., from the top-down.

Given the fundamental role the directionality meta-parameter must play in any conception of how a syntactic derivation proceeds, it may seem odd that relatively little discussion on this topic exists in the literature. The question itself was rarely even raised until relatively recently, the first detailed discussion being Phillips (1996; see also Phillips, 2003; Phillips & Lewis, 2013; Richards, 1999; Chesi, 2007, 2015; Zwart, 2009, 2015; den Dikken, 2018). To some extent, this may be because the grammar seems to

function fairly well either way. Indeed, for most syntactic phenomena, it seems not to matter much whether structures are built top-down or bottom-up (exceptions will be noted in due course). As a result, many in the field are essentially agnostic on this point. This attitude may or may not be warranted from a theory-internal perspective, but it has the undesirable effect of shielding the field from prosperous encounters with disciplines which would otherwise be natural allies. In particular, agnosticism about directionality prevents us from formulating testable predictions concerning the psychology and neuroscience of language production,<sup>224</sup> a predicament that will only intensify as these areas advance. We've got to get this straight, or linguistics runs the risk of ending up an island set apart from the rest of cognitive science.<sup>225</sup>

This chapter will be organized a bit differently from its predecessors, as I intend it largely as a speculative extension to the main concerns of this dissertation, one which examines some arguments for top-down derivations, and then considers how a model of the grammar that builds structures incrementally top-down might interact with 1) the cyclic transfer to the interfaces associated with phase theory, and 2) the postsyntactic phonological insertion model described in Chapter 4. Laying the groundwork for considering this latter interaction will be the chief contribution here, as to my knowledge no other work addresses the two meta-parameters of Chapter 1 *jointly*. The provisional model that arises from this interaction I will refer to as *Late Insertion, Top-Down (LIT-D)*, to differentiate it from models involving other settings of the meta-parameters: *Late*

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<sup>224</sup> Language comprehension is a different animal, with multiple pathways potentially available to decode a message. Indeed, some, e.g. Townsend & Bever (2001), argue for multiple pathways operating in parallel, the results of which are then compared (*analysis-by-synthesis*). Much work has of course been done on sentence processing, but a good deal less on sentence production, in part because of the issues involved here.

<sup>225</sup> For another layer to this metaphor, see the discussion of syntactic islands in §5.5.

*Insertion, Bottom-Up (LIB-U)*, as assumed by most advocates of Distributed Morphology; *Early Insertion, Top-Down (EIT-D)*, as assumed by most who have worked on top-down derivations; and *Early Insertion, Bottom-Up (EIB-U)*, as assumed in most versions of the Minimalist Program.

This chapter, which is based on Merchant (2019b), is therefore organized as follows. In §5.2, I outline some theory-external arguments for top-down structure building, contrasting iterative *Merge* and its top-down analogue *Branch* in the context of the modern consensus on the nature of temporary memory capacity, where only a limited number of ‘chunks’ can be handled at one time (Cowan, 2001, 2015). In §5.3, I review some theory-internal arguments for top-down derivations with respect to conflicting results from constituency tests (Phillips, 1996, 2003; Chesi, 2007) and certain facts about the order in which WH- dependencies are created in multiple questions (Richards, 1999). In §5.4, I briefly review some proposed implementations of top-down structure building (Phillips, 1996, 2003; Chesi, 2015; den Dikken, 2018), and then seek to characterize the phases with respect to what Chomsky (2007, 2008) calls the “duality of semantics,” arguing that roots are inserted in the upper phase (CP) for functional and discourse purposes, but are interpreted with respect to the core proposition in the lower phase (vP). I then provide a full top-down derivation that incorporates cyclic transfer to the interfaces, and therefore (per the model developed in Chapter 4) cyclic insertion of phonological forms. Finally, in §5.5, I speculate on how to account for WH islands in a top-down system, and conclude.

## 5.2 *Theory-external arguments for top-down derivations*

In this section, I consider the question of whether top-down or bottom-up structure building is more plausible as a model of how the brain constructs sentences in real time. I first argue that if we view the grammar as an abstract model of the cognitive system we call language, other cognitive systems on which language necessarily depends cannot be extraneous to understanding its operation, and thus must be addressed even when considering language as an abstraction. Next I look at the literature on limitations on temporary memory capacity, and consider how language production might be affected by these limitations, noting that for extremely long sentences, some “forgetting” is necessary in order for the system to operate. I then look briefly at phase theory, which is how the Minimalist Program deals with such “forgetting” since Chomsky (2001 [1999]). Finally, I look at the operation *Merge*, which is the main generative engine in a bottom-up system, and contrast it with the operation *Branch*, the analogue of Merge in a top-down system, arguing that the latter is far more plausible from the theory-external perspective considered here.

### 5.2.1 *The grammar as an implementation-dependent abstraction*

I will argue here that any theory of linguistic competence must include a theory of real-time sentence generation, and thus go beyond Chomsky’s abstraction of the idealized speaker:



Linguistic theory is concerned primarily with an ideal speaker-listener, in a completely homogeneous speech-community, who. . . is unaffected by such grammatically irrelevant conditions such as memory limitations, distractions, shifts of attention and interest, and errors (random or characteristic) in applying his knowledge of this language in actual performance (Chomsky, 1965:3).

Chomsky notes that only under this idealization does *performance* (“the actual use of language in concrete situations”) reflect *competence* (“the speaker-hearer’s knowledge of his language”). In the real world, “natural speech will show numerous false starts, deviations from rules, changes of plans in mid-course, and so on” (ibid.:4). Thus in order to investigate the underlying mental system involved, such deviations must be left to the side, as they are extraneous to this system.

This performance/competence distinction has long been used as a bulwark against the necessity of accounting in the grammar for every utterance of every speaker; as speech errors are frequent in actual performance, this is a desirable result. If we were to extend the grammar on the basis of every spoken form, the grammar would be complexified to the point where it would predict the acceptability of forms which most speakers would identify as simply errors. For example, Fromkin (1971) reports on the following errors:

(242) a. [Intended] *a current argument*

[Actual] *an arrent curgument*

b. [Intended] *a fall in pitch occurs at the end of the sentence*

[Actual] *an end of the sentence occurs at the fall in pitch*

(Adapted from Fromkin, *ibid.*(23a,28b))

Certainly, we do not want to postulate *arrent* as an alternate form of *current* to account for (242a). However, such an error actually tells us something about the procedures by which linguistic competence is translated into performance. The *an* allomorph of the indefinite determiner is the correct one here, suggesting that the insertion of the mapping of the phonological forms for *current* and *argument* to syllabic structure happens prior to whatever morphophonological process selects *an* over *a*.

The error in (242b), although not ungrammatical,<sup>226</sup> shows not only the correct allomorph of the determiner *a/an*, but even the intended determiners in their intended locations, despite the rest of the two noun phrases having been interchanged. One might use such an error as an argument, then, that *fall in pitch* is a constituent to the exclusion of the determiner.

There is a difference, therefore, between extending the grammar by incorporating these errors on the same basis as any other utterance, and using them to assess what sorts of grammatical processes could have produced such an error. Consider the following:

(243) a. \*That group of boys are playing soccer in the field.

b. That group of boys is playing soccer in the field.

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<sup>226</sup> The sentence does seem pragmatically odd, though, presumably because a sentence is normally understood to have only one “end.”

In (243a), we have a lack of  $\phi$ -feature agreement between *group* and *are*; this is known in the literature as an *attraction error* (Franck, Lassi, Frauenfelder & Rizzi, 2006).<sup>227</sup> Certainly we should not extend the grammar of English upon discovering such an utterance. However, we can use such an error as an assessment tool, in this instance to investigate the functioning of the operation *Agree*. The existence of this error suggests that *boys* is in the search space of the probe, and given the appropriate hiccup in computation, is mistaken in (243a) as the subject.<sup>228</sup>

So although our theory need not incorporate (243a) into the grammar (i.e., it should not be a generable sentence under our model), it should be able to explain the proximate cause of the error; this might therefore aid in our understanding of the system which correctly generates (243b). Furthermore, the theory should predict that (243a) is a possible error, but that (244) is (I assume) an impossible one:

(244) \*That group are playing soccer in the field.

We can make a similar case with respect to memory limitations. Since the advent of the Minimalist Program, Chomsky has paid slightly more attention to such concerns:

Proceeding further, MI [Minimalist Inquiries, i.e. Chomsky, 2000] proposes another reduction of **computational burden**: the derivation of Exp [an

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<sup>227</sup> This is also referred to as *ad sensum* agreement, e.g. in Saab's (2010) and Verveckken's (2012) somewhat more descriptive accounts of this phenomenon.

<sup>228</sup> There is probably a semantic element at play here, as well, as the boys are in fact playing individually as well as in a group. One would probably not make the error \**The association of lawyers were dissolved*.

expression] proceeds by *phase*, where each phase is determined by a subarray LA<sub>i</sub> of LA [Lexical Array, i.e., Numeration], **placed in ‘active memory’**.

(Chomsky, 2001:11-2; italics in original, boldface added)

The discussion of the relevance of “memory limitations” to the grammar generally revolves around two issues: the apparently unbounded character of sentences in terms of both length and complexity, and the difficulty of parsing certain structural configurations of sentences.<sup>229</sup> I agree with Chomsky that the grammar need not distinguish between what is easily parsable and what is difficult to parse, nor between singly-embedded sentences and sentences embedded *ad infinitum*. So as we should not extend the theory to incorporate speech errors such as (243a), we also need not constrict the grammar in order to bar infinitely long sentences.

However, to the extent that grammatical theory is a theory of the human linguistic system, the question of “computational burden” cannot be irrelevant. In fact, it drives much of the recent work attempting to satisfy the ideal of the Strong Minimalist Thesis, i.e., the notion of language being “an optimal solution to interface conditions. . . an optimal way to link sound and meaning” (Chomsky, 2008:3).<sup>230</sup> From this perspective,

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<sup>229</sup> The paradigm of which is the centrally-embedded sentence, e.g., *Birds cats fleas bite chase fly*. The difficulty of parsing these quite valid sentences may be explicable in terms of extralinguistic perception principles on which parsing supervenes (Bever, 1970); this phenomenon would presumably not apply to sentence generation.

<sup>230</sup> Hornstein (2008:171) argues that if we take the minimalist view of interface conditions seriously, “more transparent grammars (i.e. grammars whose operations, principles, and constructs are more directly usable by the performance systems) should be preferred to less transparent ones. . . If this is correct, however, it has an interesting consequence: a grammar’s operations and principles must be reversible. . . its operations and principles should be usable whether one is building a structure bottom-up (when deriving a sentence grammatically) or left to

grammatical theory is an abstract model of a neurological process, one that interfaces with other neurological processes, and which likely makes use of more general cognitive processes (e.g., the working memory system), even if it cannot be reduced to them. So as with speech errors, we can use what we know of these processes to assess whether our theory is on the right track.

Phillips and Lewis (2013) put this question in terms of whether we consider grammatical theory to be an *implementation-dependent* or an *implementation-independent* abstraction. An abstraction is implementation-independent if it can be “realized in different ways by multiple lower-level systems” (ibid.:14). Arithmetic is a good example; the quantity “twelve” can be expressed as the result of a number of different procedures: as the product of  $2 \times 6$ , the product of  $3 \times 4$ , the sum of  $5 + 7$ , the square root of 144, etc. Furthermore, these procedures can be implemented by a computer, by the human brain (perhaps to a lesser extent by other animal brains), by weighing objects the weight of which is known, and so on. Arithmetic is thus implementation-independent.

Human language is another matter. Despite great strides in artificial intelligence, we are far from implementing its full functionality in any medium save the organic. And it is probably not controversial that every sentence of the language has a unique derivation;<sup>231</sup> there is no analogy here to the variable procedures that all have the quantity

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right (when one is parsing a sentence in real time). The direction of the “flow” of information should not affect the applicability of the principles. They should, in short, be directionally invariant (viz. reversible).” Hornstein still assumes here, however, that although parsing may be top-down, production is a purely bottom-up process.

<sup>231</sup> Some sentences might, however, have the same derivation up until the point of phonological insertion, as I argued in §4.4 of this dissertation. Note also that “ambiguous” sentences, e.g. *I killed the king with the knife*, are not in fact an exception to the generalization that every sentence

“twelve” as a result. Our abstraction, then, is implementation-dependent. To the extent that grammatical theory aims to be a model of sentence generation, then, it must model the process by which a human brain generates a sentence, not any other process that can generate that sentence. Otherwise, it is not a model of language *per se*, but merely a model of something *like* language.<sup>232</sup>

### 5.2.2 Language production and temporary memory capacity

The terms *short-term memory*, *working memory*, and *temporary memory capacity*, although occasionally distinguished in individual theoretical models,<sup>233</sup> will nonetheless be used synonymously here: all refer to the extent to which an arrangement of items can be temporarily held in a mental workspace (usually for about 30 seconds or less; Healy, 2001); this is distinct from *long-term memory*. Although the distinction goes back to William James’s *primary* and *secondary memory* (James, 1890), the most influential modern work on the subject was George Miller’s paper “The Magical Number Seven, Plus or Minus Two” (Miller, 1956). This (somewhat facetiously titled) paper was concerned with a number of different limitations in cognitive processing, all of which coincided roughly around the number 7. Across a wide range of perceptual experiments in varying sensory modalities, in which (e.g.) subjects attempt to distinguish a number of

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has a unique derivation, as they are only ambiguous from the perspective of comprehension. In the mind of the speaker, who will always have one meaning or the other in mind, they are unambiguous.

<sup>232</sup> I would argue that this conclusion is correct even if the results of the derivations are the same (i.e., even if the same sentence is generated).

<sup>233</sup> The distinction is often between working memory as an actively controlled resource, and short term memory simply as a passive storage device.

musical tones which had been assigned arbitrary numbers, Miller claimed that people are able to work with roughly seven different distinctions successfully, with a standard deviation of around two (hence his title).<sup>234</sup>

Relevant here, however, is the paper's secondary focus on the number of elements that can be manipulated in short-term memory. Miller discussed a series of experiments by Hayes (1952), who tested this with five different kinds of stimuli: binary digits, decimal digits, letters of the alphabet, letters plus decimal digits, and monosyllabic English words. For binary digits (i.e., for a string of zeros and ones), subjects could recall about nine accurately. For the monosyllabic words, this dropped to about five. In all cases, the mean was between five and nine (i.e.,  $7 \pm 2$ ).

However, Miller noted that it is not seven independent bits of information that are being accessed here, but rather seven *chunks* of information. For example, the monosyllabic words in Hayes' experiment had on average three phonemes. Nonetheless, Miller points out, it seems clear that subjects were recalling five words, not fifteen phonemes. Thus the words served as chunks of information, each containing multiple individual pieces of information.

A number of models of working memory have been advanced since Miller; Atkinson and Shiffrin (1968) advocated a unitary model, in which all information is processed by the same component. Probably the most widely accepted, however, is that of Baddeley and Hitch (1974) (and subsequent work), who argue that working memory is composed of three chief components: a *central executive* (an attentional system which

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<sup>234</sup> Miller actually couches the discussion in terms of *bits* of information, such that 1 bit corresponds to 2 possibilities (when a judgement is one-dimensional), 2 bits to 4 possibilities, 3 bits to 9, and so on. In the variety of tasks he considers, the mean is 2.6 bits and the standard deviation 0.6 bits (ibid.:86), corresponding roughly to  $7 \pm 2$ .

coordinates other functions), a *visuo-spatial sketch pad* (for short-term storage of spatial information), and a *phonological loop*, a buffer consisting of a *phonological store* (working something like an echo chamber) and an *articulatory control process* which instructs the phonological store to continually rehearse information. In order for information to be retained in working memory for more than a few seconds, it must be rehearsed in this manner. Baddeley (2000) adds a fourth component, the *episodic buffer*, which combines information from several sources (including long-term memory) into a coherent representation of an event (see also Baddeley & Wilson, 2002).

Baddeley and colleagues' model is not specific to language, of course, but deals with working memory more generally. There has been a good deal of research on the interaction of working memory and language, although much of it has focused on comprehension (as is true in psycholinguistics generally). Martin and Slevc (2014), however, review a number of studies concerning the role of working memory in language production. Kemper et al. (2009), for example, found that the greater cognitive load caused by a concurrent task (tracking a moving target on a screen with a mouse) reduced grammatical complexity in subjects' responses to prompts like 'where were you and what were you doing on 9/11' and 'describe someone you admire and why you admire them'. Compared to baselines from the same subjects, the average number of clauses per utterance decreased significantly under these conditions. This effect was especially pronounced for individuals separately assessed as having lower working memory



capacity, suggesting that working memory plays an important role in producing grammatically complex sentences.<sup>235,236</sup>

Since Miller's initial paper, the limits of temporary memory capacity have been revised downward. Cowan (2001), in an extensive review of the literature, concludes that only 3 to 5 unrelated 'chunks' can be handled at one time, although the true number may be domain-specific (see also Cowan, 2015). When these chunks are composed of words in a sentence, the capacity increases, perhaps to 15-16 words (Baddeley, Vallar, & Wilson, 1987). This is presumably due to a process of grammatical encoding, by which words are combined into phrases; the phrases therefore serve as chunks from the perspective of working memory. This chunking is not without limit, though, as the total number of words remains relevant.

Given all this, one would expect an upper limit on the length and complexity of sentences in real-time production,<sup>237</sup> with a maximum of about 15-16 words encoded into 3-5 chunks. However, it's not difficult to find sentences much longer than that; the following has some sixty-five words:

(245) So the Trump administration ended up relying on, first, staff associated with Mike Pence, who had deep ties to the anti-abortion movement —

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<sup>235</sup> Martin & Slevc (ibid.) argue also that working memory plays an important role in grammatical agreement, with some studies suggesting higher rates of attraction errors (as in (243a) above) when subjects are under a high working memory load due to a concurrent task. See also §5.2.1 and fn. 4 above.

<sup>236</sup> In a recent study, De Santo (2019), using a top-down minimalist parser (Stabler, 2013), looks at relative clause (RC) parsing in Italian, arguing that the preference for subject RCs over object RCs is due to a direct connection between working memory burden and syntactic complexity.

<sup>237</sup> Sentences not constructed in real time (e.g., written sentences, sentences stored in long term memory as quotes or mantras, etc.) can be much longer, of course.

and then also think tanks like the Heritage Foundation, this very conservative group in Washington, D.C., that had fallen out of some favor and really got a big break by attaching to the Trump campaign as kind of the dark horse candidate.

(Dan Diamond, in an interview on NPR's *Fresh Air*, Jan. 25, 2018)

In order for (245) to have been constructed in real time, some process of “forgetting” must be involved, in which earlier chunks are processed by the computational component, transferred to the interfaces, and articulated, at which point the attention of the central executive (in Baddeley's terms) can turn to the next set of chunks. But how are we to incorporate such a procedure into linguistic theory? In the next section, I briefly introduce the basics of the version of the Minimalist Program known as *phase theory* (Chomsky, 2001 [1999]), although I reserve more detailed discussion for §5.4.

### 5.2.3 *Phase theory*

In this section, I briefly introduce phase theory in the context of the theory-external considerations at question here. I begin by repeating the quote from Chomsky's “Derivation by Phase” from §5.2.1 above:

Proceeding further, MI [Minimalist Inquiries, i.e. Chomsky, 2000] proposes another reduction of computational burden: the derivation of Exp [an expression]

proceeds by *phase*, where each phase is determined by a subarray  $LA_i$  of LA [Lexical Array, i.e., Numeration], placed in ‘active memory’.

(Chomsky, 2001:11-12)

Phase theory reduces the “computational burden” (in psychological terms, the *cognitive load*) of a derivation by dividing it into smaller pieces known as *phases*, each of which is handled separately (although with the possibility that some information is transferred from phase to phase). In any given phase, only a limited number of chunks are in “active memory”; this presumably will correspond to working memory. This is accomplished via partitioning off parts of the Numeration, so that each phase only works with a small lexical subarray.

Phase theory assumes most of the constructs associated with the preexisting Minimalist Program. With respect to theory-internal considerations, it differs largely in how it implements syntactic locality, a necessary part of the theory since at least Ross (1985 [1967]); it does so by limiting the parts of the phase which are visible outside of the phase itself, and thus liable to displacement outside of the phase.<sup>238</sup> Chomsky (2012) defines a phase in these terms:

Let us take a phase to be the smallest syntactic object which. . . has an interior that is immune to change. Immunity of the interior to change is what has been called the *Phase Impenetrability Condition* (PIC). PIC is guaranteed by Transfer to the interfaces of all information that would allow the interior to be modified (ibid.:5).

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<sup>238</sup> The phase has also been argued to represent the relevant domain for locality effects in binding theory (Lee-Schoenfeld, 2008).

The PIC only applies to the interior of the phase. There is also an interface between phases to which the PIC does not apply, known as the *phase edge*; this consists of the heads and specifiers of phase-triggering projections: CP and vP.<sup>239</sup> In order for a syntactic object to be visible outside of the phase in which it is introduced, it must first move to the phase edge. When a phase edge is complete, everything but the edge is spelled out, i.e., submitted to the sensorimotor (SM) and conceptual-intentional (CI) systems for articulation and interpretation, respectively. At this juncture, the construction of another phase begins.

Apart from theory-internal arguments for phase theory, it seems like a natural candidate for a model of how the brain is able to construct long, complex sentences such as (245) above. Although the “reduction of computational burden” involved was not the driving force behind the development of phase theory, it provides a strong external justification for what would otherwise be a model based on theory-internal considerations. However, standard Phase theory constructs syntactic objects via *Merge*, an operation that begins with the most deeply-embedded terminals and proceeds upward; this will be somewhat more problematic for the psycholinguistic view. In the next section, I compare and contrast *Merge* and its top-down analogue, which I refer to as *Branch*, from this perspective.

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<sup>239</sup> Chomsky (2001 [1999]) distinguishes between transitive  $v^*$  and defective  $v$ , which is involved in (e.g.) raising predicates; the latter is not a (strong) phase head. Except where the distinction is relevant and so noted, I use here  $v$  for both  $v$  and  $v^*$ .

#### 5.2.4 *Branch v. Merge*

The question of the directionality of derivations was rarely even raised until the rise of the Minimalist Program (Chomsky, 1993, 1995, etc.).<sup>240</sup> One reason for this is that in earlier approaches, derivations were conceived of as being assembled in one fell swoop, and subsequently adjusted by “singular transformations” (e.g., Passive; Chomsky, 1955, 1957). As the theory developed, these transformations were recast as “movement,” and it eventually it became apparent that almost all such cases of movement were bottom-up.<sup>241</sup> This was not initially a question of the directionality of derivations *per se*, but rather a question of the directionality of the adjustments necessary to transform the results of the structure-building processes of the base into the linearized, language-specific structures that are represented by actual spoken sentences. (In the parlance of the day, it was a question of the directionality of the displacement of lexical items from *deep structure* into *surface structure* configurations.)

Nonetheless, the bias resulting from the empirical observations about “upward” movement was present when, with the advent of the Minimalist Program (MP), derivations were newly conceived of as structures built by a series of incremental applications of *Merge*. In fact, it is the precise formulation of *Merge* (which I take here from Chomsky, 2001:3) as an operation which “takes two syntactic objects  $\alpha$  and  $\beta$  and

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<sup>240</sup> However, Chomsky (1957:Chap. 4) does have some indirect discussion of this question, with his (14) illustrating what is essentially a top-down, incremental derivation beginning with *Sentence* and rewriting it in the next step as *NP + VP*, the phrase structure tree (15) representing the result of such a derivation. He notes that “two derivations are equivalent if they reduce to the same diagram of the form (15)” (ibid.:28). Having established this, however, he moves on to other matters.

<sup>241</sup> There were of course analyses involving “downward” movement that persisted for some time, e.g., Chomsky’s (1957) original account of affix-lowering in the English aspect system, still used in the first edition of Carnie’s *Syntax* textbook (Carnie, 2002).

forms the new object  $\gamma = \{\alpha, \beta\}$ ” that implements this “upward” bias in the MP. In other words, it is the directionality implicit in the formulation of Merge itself that requires a view of structure building as proceeding from the bottom-up.

However, a precisely isomorphic formulation of Merge is in theory available; I provisionally characterize it as follows:

- (246) *Branch*: Take a syntactic object  $\gamma$ , and form two new objects  $\alpha$  and  $\beta$ ,  
where  $\gamma = \{\alpha, \beta\}$ .

Branch<sup>242</sup> and Merge differ only in terms of the directionality of the structure-building they entail; they produce the same structures.<sup>243</sup> If this is true, then absent the preexisting bias towards “upward” movement, neither is *a priori* more plausible theory-internally, even if nearly the whole of the syntactic literature is written from the perspective of the latter.

From a theory-external perspective, however, I think it will not be difficult to demonstrate that Branch is more plausible. Given that we speak from left to right,<sup>244</sup> more or less with the least deeply embedded terminals spoken first and the most deeply

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<sup>242</sup> I have adapted this term from Phillips’s (1996) *Branch Right* (although I considered also *Bizarro Merge*). Zwart (2009), who proposes a top-down structure building model more removed from mainstream assumptions than those considered here, adopts the term *Split Merge* instead.

<sup>243</sup> Associated processes will look slightly different under Branch as well. For example, the specifics of the labelling algorithm involved (Chomsky, 1995:243-46; Rizzi, 2016) will be different, as a selected XP will need to “project” its label downwards in an endocentric manner, as in principle either  $\alpha$  or  $\beta$  could inherit the label of  $\gamma$ . As Phillips & Lewis (2013:16) note, “[e]ndocentricity is a condition on the structure as a whole.” I thank an anonymous reviewer of Merchant (2019b) for raising this point.

<sup>244</sup> Strictly speaking, *left*, *right*, *up*, and *down* are arbitrary vectors, but of course they are used here with their normal implications: *left* meaning temporally preceding, *down* meaning towards the most deeply embedded terminals, etc.

embedded spoken last, the intuitive answer would be that we begin constructing a sentence by speaking the first few words and then branching out to add more phrases, embedded clauses, etc.<sup>245</sup> But it's not unthinkable that perhaps we construct these sentences "backward," at least for simple sentences like (247):

(247) Boys like dogs.

However, multiply-embedded sentences replete with long-distance dependencies are par for the course in human language; the following is probably not at the tail end of the distribution:

(248) [The boy]<sub>i</sub> is likely  $t_i$  to be very happy  $t_i$  to have arrived  $t_i$ .

The bottom-up model predicts that the matrix subject in (248) reaches its SPELLOUT position after three separate displacements;<sup>246</sup> for it to be pronounced, therefore, the entire derivation must first be constructed. This is a rather severe deficiency of Merge; under this model, one cannot begin speaking until the derivation is complete. This is because the cyclic transfer to the interfaces associated with phase theory proceeds from the bottom-up; the structures of the higher phases are not spelled out and sent to the phonological component until *after* this process is complete for all the phases below.

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<sup>245</sup> Indeed, I have found it quite nearly impossible to explain to non-linguists how heterodox this aspect of my research is, as the near-universal intuitive response is that it should be self-evident that sentences are constructed from left to right.

<sup>246</sup> Assuming successive cyclic movement and the Unaccusative Hypothesis (Perlmutter, 1978) are both correct, of course; if only the former is correct, only two displacements are necessary.

Even if the structures associated with the lower phases can be “forgotten” to some extent,<sup>247</sup> the phonological forms associated with terminals must be retained in their linear order. In (249) I illustrate the series of applications of Merge necessary before the subject in (248) can be pronounced; note that this does not happen until Step (xii).

- (249) i) the boy  
 ii) arrived the boy  
 iii) have arrived the boy  
 iv) to have arrived the boy  
 v) the boy to have arrived ~~the boy~~  
 vi) happy the boy to have arrived ~~the boy~~  
 vii) be happy the boy to have arrived ~~the boy~~  
 viii) to be happy the boy to have arrived ~~the boy~~  
 ix) the boy to be happy ~~the boy~~ to have arrived ~~the boy~~  
 x) likely the boy to be happy ~~the boy~~ to have arrived ~~the boy~~  
 xi) is likely the boy to be happy ~~the boy~~ to have arrived ~~the boy~~  
 xii) the boy is likely ~~the boy~~ to be happy ~~the boy~~ to have arrived ~~the boy~~

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<sup>247</sup> Of course, they cannot be forgotten completely if we take reconstruction effects to be both psychologically real and postsyntactic. Den Dikken (2018:65-66), building on arguments in Epstein & Seely (2002), points out that for uninterpretable features such as Case, SPELLOUT must be able to access information for displaced WH- elements from lower phases (for the purposes of valuation), and as such the grammar cannot fully “forget” this information.



Under phase-theoretic Branch, however, a speaker can begin to speak more or less as soon as the derivation begins, once elements from Numeration are inserted into the structure and the highest phase is complete.<sup>248</sup> Once the elements of the higher phase have been transferred to the interfaces, they can be forgotten completely (although copies of such will still need to end up in theta positions for the purposes of propositional interpretation; see §5.4). In (250), I illustrate a series of operations of Branch, producing the same structure as does Merge in (249). The subject is available for transfer as soon as the first phase boundary is encountered, immediately after step (i).<sup>249</sup>

- (250) i) the boy
- ii) the boy is
- iii) the boy is likely
- iv) the boy is likely ~~the boy~~
- v) . . . .

Note that the observation that an entire structure must be built by Merge before any of it is pronounced comes with a strong prediction: speakers will never (in fact, cannot!) begin articulating a sentence without being precisely sure of how they intend to end that

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<sup>248</sup> Assuming functional projections (CP, TP, vP) whose specifiers are on the left. For languages with right-headed TPs (e.g., German), the T head may be spelled out before the lower phase is built, but it is linearized to the right of the vP, so some sort of purely phonological buffer may be required.

<sup>249</sup> Technically, this is not true for defective *v* in raising structures like (248), where *v* is a “weak” phase head (Chomsky, 2001 [1999]), and so Spellout isn’t triggered until the complement of *likely* is added after Step (iii). However, it’s conceivable that for weak phases, the transfer to the PF interface might happen at the same juncture as in a strong phase, with the transfer to the semantic interface happening separately.

sentence. Indeed, sentence generation that depends exclusively on Merge for structure building predicts this phenomenon to be impossible. This flies in the face of intuition. For illustration, consider the following hypothetical exchange:

(251) Speaker A: Is there any way you could lend me some money?

Speaker B: Well, how much do you. . .

*(Speaker B pauses to consider whether to ask Speaker A how much he wants, or whether it would be more prudent to ask how much he needs.)*

Speaker B: . . . need?

The contrast between Branch and Merge here is quite stark. Bottom-up Merge simply cannot generate a structure with an open position like this, in which the higher phase has been spelled out and sent to the PF interface, but in which the Numeration of the lower phase has not even been established. The decision to utter *want* or *need* must happen before the speaker begins speaking.

Branch, on the other hand, handles this effortlessly. Setting aside the details of *do*-support, the lexical sub-array of the higher phase in Speaker B's utterance in (251) would contain just *how much* and *you*. This much can be transferred to the interfaces upon completion of the higher phase, and is therefore available to be spoken. Next, the sub-array associated with the lower phase is enumerated. At this point, of course, the speaker may pause, considering first one verb and then another before making a selection.

Note also that phase-theoretic Branch requires only a limited number of elements in the workspace at a time, whereas Merge requires all the lexical items in the entire

lower structure to be dragged along, even if spelled out, because none of them can be articulated until the entire derivation is complete. As noted in §5.2.2, from the perspective of temporary memory capacity, retaining this many words is extremely unlikely. In light of the extensive psychological literature on this subject (see Cowan, 2001, 2015, and references therein), it is probably not putting it too strongly to say that it is impossible for the *Fresh Air* sentence in (245) to have been constructed in real time by a bottom-up derivation powered by Merge. We are left, then, with purely bottom-up derivations as models not of human sentence-generation, i.e., not of language itself, but as a model that only approximates this capacity. Top-down derivations, on the other hand, are well positioned to generate such sentences.

### *5.3 Theory-internal evidence for top-down generation*

The theory-external arguments for Branch over Merge, I believe, are quite robust. In this section, I look at some theory-internal evidence that has been proffered for top-down derivations. Although I find these arguments largely convincing, they are probably not significant enough in themselves to justify an abandonment of bottom-up structure building. However, in light of the theory external-arguments in §5.2, I believe them worth examining.

### 5.3.1 Evidence from constituency tests

Given the identical formulations of Branch and Merge as they stand (save for directionality), any sentence is in theory generable by either. The only theory-internal evidence likely to be available, then, would come either from tests which apply to derivations *in medias res*, targeting intermediate structures, or from cases in which the application of a rule would feed the application of another in a given direction, but bleed (or counterfeed) it in the opposite direction.<sup>250</sup> One example of the former is the coordination test for constituency: if a string of words can be coordinated with another similar string, that string is generally thought to represent a constituent. Phillips (1996, 2003) examines the conflicting structural diagnoses provided by different constituency tests in some detail. Although most constituency tests point to verbs and objects forming a constituent to the exclusion of the subject, he notes that the coordination test shows conflicting results. Applying this test in (252b), it seems that the verb in (252a) forms a constituent with the object. However, the application of this test in (252c) suggests instead that it forms a constituent with the subject:

- (252) a. John roasted the turkey.  
       b. John [[roasted the turkey] and [steamed the broccoli]].  
       c. [[John roasted] and [Mary carved]] the turkey.

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<sup>250</sup> These terms are perhaps familiar from the domain of phonology, but I will briefly note their meanings here. When one rule *feeds* another, it creates the environment for the second rule to apply; when the order of these rules is switched, they are now in *counterfeeding* order, and the second rule never applies. When a rule *bleeds* another, it destroys the environment in which the second rule otherwise would have applied; *counterbleeding* order is when the order of the rules is switched, and so the environment for the second rule to apply is intact at the time of application.

This is of course puzzling; how can *roasted* form a constituent both with the object to the exclusion of the subject, as in (252b), and with the subject to the exclusion of the object, as in (252c)?

Complicating the picture even further, Chesi (2007:5) observes that in SOV languages like Japanese, Subject + Object sequences can be coordinated to the exclusion of the verb:

- (253) *Mary-ga ringo-o 2-tu to Nancy-ga banana-o 3-bon tabeta (koto)*  
 [[Mary-NOM apple-ACC 2-CL] and [Nancy-NOM banana-ACC 3-CL]] ate  
 ‘Mary ate two apples, and Nancy (ate) three bananas’

The issue in the English example in (252c) is that the subject and verb appear to have been coordinated before the object is attached; the issue in the Japanese example in (253) is that the subject and object have been coordinated before the verb is attached. If constituents are built incrementally bottom-up, we have no way to capture such a structure; the bracketed elements in both sentences do not at any point in the derivation form a constituent. To get out of this quandary, we must either assume multiple structural representations operating in parallel (as in, e.g. Pesetsky, 1995<sup>251</sup>), or stipulate that (252c)

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<sup>251</sup> Pesetsky (1995) describes sentences such as *John gave books to them in the garden on each other's birthdays*, where the anaphor is found in an adjunct presumably adjoined high in the VP and is therefore unbound; Phillips refers to this as “Pesetsky’s paradox.” Pesetsky proposes that all VPs have two parallel structural descriptions, and that binding takes place in a ‘cascading’ structure in which the adjunct is lower in the VP. However, as *give the books to them* can be fronted to the exclusion of the adjuncts, it presumably forms a constituent, and so a standard layered structure is needed as well. Although such a system may be possible, it seems to me somewhat antithetical to the spirit of the Strong Minimalist Thesis (i.e., language being an optimal way to link sound and meaning).

is merely a case of disguised clausal coordination (along the lines of Ross, 1985 [1967]:105-7), with the first occurrence of *the turkey* deleted.<sup>252</sup>

However, if constituents are built incrementally top-down, we can identify an intermediate point of the derivation where the verb has been attached, but the object has not yet been spelled out:

- (254) (i) John  
 (ii) [John roasted]  
 (iii) [[John roasted] and [Mary carved]]<sup>253</sup>  
 (iv) [[John roasted] and [Mary carved] [the turkey]]

In Step (iv), the subject-verb constituency is destroyed; they no longer form a constituent to the exclusion of the object (note the second closing bracket moving from immediately after *carved* to after *turkey*). However, the coordinate structure has already been built, so the issue of its constituency is moot. This constituency test applies only at an intermediate point in the derivation, one in which the S-V string has *temporary constituency*. An essentially identical solution, *mutatis mutandis*, is available for (253);

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<sup>252</sup> Note that the Ross-style solution is even less practical for the Japanese data in (253), in which it is the first occurrence of *tabeta* ‘eat’ that is deleted. This contrasts with the (idiomatic) clausal-coordination translation in English, where the second occurrence of *eat* is deleted. See also Sato (2009), who analyzes similar structures in Japanese as coordinated vP/VPs.

<sup>253</sup> The specifics of coordinate structure, i.e., whether it is ternary- or binary-branching, I leave to the side. Note also that *Mary carved* is syntactically complex, and in a bottom-up approach would have to be constructed in a separate workspace (see e.g. Nunes & Uriagereka, 2000), but in a top-down approach can be constructed in parallel with *John roasted*, i.e., without requiring a separate tree.

the Subj and Obj in a Japanese sentence form a temporary constituent that can be coordinated with another S-O string before the V is added.<sup>254</sup>

### 5.3.2 Evidence from multiple WH- questions

Richards (1999) argues for top-down derivations on the basis of a diagnostic which seems to indicate that displacement triggered by heads high in a tree occurs earlier in a derivation than similar displacements triggered by heads lower in the tree. Working before phase theory became the predominant approach to syntactic locality, Richards argue for a novel approach to what was then known as Subjacency<sup>255</sup>:

[O]nce an attractor has attracted a wh- phrase in a way which obeys Subjacency, it is free to trigger Subjacency-disobeying movements for the rest of the derivation. We may think of Subjacency. . . as being like a “tax” that must be paid once; once one wh-phrase has paid the Subjacency Tax, subsequent wh-movements need not pay it again (ibid:69).

Richards illustrates with sentences involving multiple WH- movement. In English, such movement happens only covertly (i.e., at the level of Logical Form). In (255), the WH-phrase *which book* is claimed to move covertly:

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<sup>254</sup> I review Phillips’ solution here in slightly more detail in §5.4.1 below.

<sup>255</sup> As noted earlier, questions of syntactic locality can be traced back to Ross (1985 [1967]). The term *Subjacency* comes originally from Chomsky (1973); Chomsky (1977) defines it as follows: “a cyclic rule cannot move a phrase from position Y to position X (or conversely) in: . . . X . . . [ $\alpha$  . . . [ $\beta$  . . . Y . . .] . . .] . . . X . . ., where  $\alpha$  and  $\beta$  are cyclic nodes” (ibid.:73).

- (255) a. Which senator denied the rumor he wanted to ban which book?  
 b. [which senator]<sub>i</sub> [which book]<sub>j</sub>  $t_i$  denied the rumor he wanted to ban  $t_j$

(Adapted from Richards, 1999(3c))

The grammaticality of (255a) is surprising, as the covert movement of *which book* involves extraction from an island. Of course, we have no actual evidence of movement here; perhaps the covert movement in (255b) does not happen at all. In Bulgarian, however, all WH- movement is overt:

- (256) a. Koj senator koja kniga otreče malva-ta čeiska da zabrani?  
 which senator which book denied rumor-the that wanted to ban  
 ‘Which senator denied the rumor that he wanted to ban which book?’  
 [koj senator]<sub>i</sub> [koja kniga]<sub>j</sub>  $t_i$  [otreče malva-ta čeiska da zabrani  $t_j$ ]

(Adapted from Richards, 1999(5c))

In (256), we can see that the WH- phrase *koja kniga* (‘which book’) has been extracted from an island, and moved to the matrix CP.<sup>256</sup> Richards argues that this is possible because the WH- phrase *koj senator* (‘which senator’), having been extracted in a well-formed movement, has already paid the Subjacency Tax; the other WH- phrase therefore now has a free pass.

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<sup>256</sup> See Rudin (1988) for a Government and Binding analysis of multiple WH- movement in Slavic languages such as Bulgarian.



Bosković (1997 [1995])<sup>257</sup> had noted that in cases of multiple WH- movement in single clauses in Bulgarian, the WH- phrases must appear in a specified order. Richards credits this to a constraint he refers to as *Shortest Attract*: “An attractor must attract the closest possible attractee” (ibid.(11)). Shortest Attract will work just like the Subjacency Tax, in that it only has to be paid once. In (257a), it is satisfied by the initial movement of *kogo*, but in (257b), Shortest Attract is violated by first attracting *kakvo* (‘what’):

(257) a. Kogo kakvo e pital Ivan?

whom what AUX asked Ivan

‘Who(m) did Ivan ask what?’

b. ?\*Kakvo kogo e pital Ivan?

what whom AUX asked Ivan

(Adapted from Richards, ibid.(13))

The order between the WH- phrases in (257a) reflects the underlying c-command relation between them; reversing this order is not possible (257b). However, Bulgarian also allows for a third WH- phrase to raise to the CP, and when a third such phrase is involved, the order between the second and third is irrelevant:

(258) a. Koj kogo kakvo e pital?

who whom what AUX asked

‘Who asked whom what?’

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<sup>257</sup> Richards cites Bosković’s 1995 manuscript here, published as Bosković (1997).

b. Koj kakvo kogo e pital?

who what whom AUX asked

‘Who asked whom what?’

(Adapted from Richards, *ibid.*(14))

Richards concludes that a well-formed move (which respects Shortest Attract) must precede the otherwise ill-formed moves. In (258a-b), it does not matter which WH-phrase moves second, as the Shortest Attract tax has already been paid.

Richards generalizes the Subjacency Tax and Shortest Attract into the following principle:

(259) *Principle of Minimal Compliance (PMC)*: Given a dependency D that obeys a constraint C, the participants in D can be ignored for the rest of the derivation for purposes of determining whether any other dependency D' obeys C. (Adapted from Richards, *ibid.*(8))

Richards proposes using the PMC as a diagnostic for the order in which operations in a derivation proceed. I think it's worth quoting his argument here at length:

The PMC case discussed here will involve a well-formed move triggered by an attractor high in the tree which allows an attractor lower in the tree to trigger an ill-formed movement with impunity. . . [this] will crucially involve movement triggered by a higher attractor which precedes movement triggered by a lower

attractor in the derivation. If we are to derive cyclicity effects by forcing the tree to be constructed in a particular direction and allowing the operations involved in constructing the tree to be interleaved with other syntactic operations, then the top of the tree will have to exist before the bottom of the tree; that is, the tree will have to be constructed from the top down (Richards, 1999:74).

The PMC case Richards considers is in (260); note the contrast between the (a) and (b) examples:

- (260) a. Who<sub>i</sub> *t<sub>i</sub>* wonders what<sub>k</sub> who<sub>j</sub> *t<sub>j</sub>* bought *t<sub>k</sub>*?  
 b. \*John wonders what<sub>k</sub> who<sub>j</sub> *t<sub>j</sub>* bought *t<sub>k</sub>*?

(Adapted from Richards, *ibid.*(16,19))

Given that the only difference between these two sentences is the nature of the matrix subject, and that therefore the same movement operations apply in the embedded clause in both cases, it is puzzling that (260a) is acceptable at all.<sup>258</sup>

Richards' solution is that the well-formed movement of *who<sub>i</sub>* in (260a) feeds the otherwise-ill-formed violation of Shortest Attract in the embedded clause, where *what<sub>k</sub>* raises from object position to the embedded CP. Crucially, the well-formed movement must occur earlier in the derivation than the ill-formed movement in order for it to feed the latter. If this is the case, the tree must be constructed from the top-down, with the

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<sup>258</sup> For me, this sentence is only acceptable with exactly the right emphasis on *what* and the embedded *who*. The interpretation is something like 'Who wonders which person bought what things?'

WH- movement in the matrix clause occurring earlier than the WH- movement in the embedded clause.<sup>259</sup> If the tree were constructed from the bottom-up, *what* could not be moved past the embedded *who*, as this is a violation of Shortest Attract; this would be counterfeeding.

Richards instead offers a top-down derivation of (260a), proceeding roughly as follows:

- (261) (i) Who<sub>i</sub> C  
 (ii) Who<sub>i</sub> C ~~who<sub>i</sub>~~  
 (iii) Who<sub>i</sub> C ~~who<sub>i</sub>~~ wonders  
 (iv) Who<sub>i</sub> C ~~who<sub>i</sub>~~ wonders what  
 (v) Who<sub>i</sub> C ~~who<sub>i</sub>~~ wonders what<sub>k</sub> C  
 (vi) Who<sub>i</sub> C ~~who<sub>i</sub>~~ wonders what<sub>k</sub> C who<sub>j</sub><sup>260</sup>  
 (vii) Who<sub>i</sub> C ~~who<sub>i</sub>~~ wonders what<sub>k</sub> C who<sub>j</sub> ~~who<sub>j</sub>~~  
 (viii) Who<sub>i</sub> C ~~who<sub>i</sub>~~ wonders what<sub>k</sub> C who<sub>j</sub> ~~who<sub>j</sub>~~ bought  
 (ix) Who<sub>i</sub> C ~~who<sub>i</sub>~~ wonders what<sub>k</sub> C who<sub>j</sub> ~~who<sub>j</sub>~~ bought-~~what<sub>k</sub>~~

(Adapted from Richards, *ibid.*(21-26))

Here the well-formed movement of the copy of *who<sub>i</sub>* in the matrix clause in Step (ii) allows for the otherwise ill-formed movement of the copy of *what<sub>k</sub>* in Step (ix).

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<sup>259</sup> This would not have been a necessary conclusion pre-MP, as the D-structure of a derivation could theoretically be constructed bottom-up, only for WH- movement to proceed top-down. But once movement is reconstrued as (Internal) Merge, this option disappears.

<sup>260</sup> Richards additionally posits covert movement of *who<sub>j</sub>* into the matrix clause to account for its taking wide scope in this sentence; I ignore this complication here.

The theory-internal evidence considered here and in §5.3.1 is relatively slim,<sup>261</sup> and other explanations of these facts may be available. However, the theory-external arguments for top-down structure building are quite robust, which I think justifies further investigation into theory-internal phenomena that may be affected in various models that attempt to implement top-down derivations. Given that this chapter represents something of a speculative extension to the main concerns of this dissertation, I offer in the next section only relatively brief reviews of the top-down models that have been proposed, and instead focus on characterizing the CP and vP phases from the perspective of semantics, before sketching out a model of sentence generation which incorporates both top-down structure building and the postsyntactic insertion of Chapter 4.

#### *5.4 Top-down derivations: Theoretical implementations*

In this section, I look into some of the issues around how top-down structure building might operate. In preceding sections, I've laid out some of the evidence suggesting that top-down derivations should be considered a desideratum. The question, then, is whether they're workable, and whether we can import decades of grammatical theory into this (apparently) radical new framework without discarding the baby with the bathwater.

I will tread lightly here, noting that relatively detailed proposals exist elsewhere: Phillips (1996, 2003) and Chesi (2007, 2015) both describe top-down systems, with Phillips (1996) identifying the parser with the grammar, focusing on arguments from

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<sup>261</sup> I should note that Phillips, Chesi, and Richards all provide additional evidence beyond what I have reviewed here; however, I think this review has been representative of the range of arguments that exist.

conflicting constituency tests and the ‘Pesetsky paradox’,<sup>262</sup> and Chesi focusing on deriving successive cyclicity from the use of a Last In First Out (LIFO) memory buffer, as well as on subject and adjunct islands and parasitic gaps. Recently, den Dikken (2018:Chap. 2) has assessed both of these models critically and in an extended fashion (as well as proposing his own, an Agree-based approach), and I refer the reader to that work for details. The differences between the machinery involved in den Dikken’s proposal and Chesi’s appear to be relatively minor, however, and unlike Phillips, both attempt to incorporate phase theory into top-down structure building.

In what follows, I briefly review Phillips’, Chesi’s, and den Dikken’s models, before turning to characterizing the interpretive division-of-labor-by-phase, connecting it to what Chomsky (2008:8) calls the ‘dual semantics’ of the *Conceptual-intentional* (C-I) system, before sketching out a version of phase theory with top-down derivations, one that should be more or less functionally compatible with den Dikken’s and Chesi’s models, but which hews a bit more closely to mainstream assumptions in phase theory. I then provide a full sample derivation that combines top-down structure building with the postsyntactic insertion model described in Chapter 4.

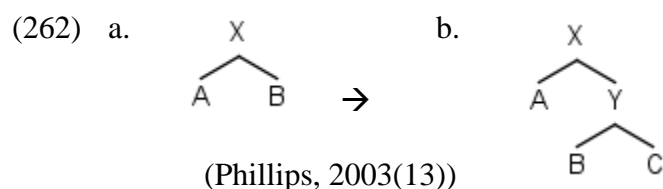
#### 5.4.1 *Previous top-down models*

In an effort to account for conflicting results from constituency tests (see §5.3.1 above) Phillips (1996, 2003; see also Phillips and Lewis, 2013) argues for the *Incrementality Hypothesis (IH)*: “Sentence structures are built incrementally from left to right” (Phillips,

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<sup>262</sup> See §5.3.1 and fn. 24.

2003(11)).<sup>263</sup> The procedure by which this is accomplished he refers to as *Branch Right* (BR), which requires that “paths through the phrase marker from one terminal node to the next terminal node be as short as possible” (Phillips, 1996:111). Branch Right and the Incrementality Hypothesis together allow for a solution to the problem of coordination of (apparent) nonconstituents, via the kind of structure building schematized in (262):



In (262a), the sequence <A,B> is a constituent, but in (262b) this constituent is destroyed. However, before <C> is added to the tree, the constituent <A,B> may be coordinated with another constituent <D,E>, which remains even after <C> is added.

As noted earlier, Phillips (1996) was the first to propose reversing the assumed directionality of derivations, but none of his works (to my knowledge) focus on questions of syntactic locality in top-down derivations. Chesi (2007, 2015), on the other hand, focuses directly on deriving successive cyclicity from the use of a Last In First Out (LIFO) memory buffer, as well as on subject and adjunct islands and parasitic gaps.<sup>264</sup> For Chesi, structure building is driven by local lexical selection:

<sup>263</sup> Phillips and Lewis (2013:9) modify this to “a *roughly* left-to-right order,” to allow for head-final phrases; this possibility is one of the reasons why I prefer *top-down* and *Branch*.

<sup>264</sup> I will however not review the specifics of these arguments here.

When a verb selects an argument. . . it will trigger prediction of the features associated with that required argument (e.g., all necessary features that make such an argument a full DP, like a functional feature D, for determiner, and a lexical feature N, for nominal). This will introduce into the syntactic tree the relevant features (e.g., [<sub>VP</sub> . . . buy [<sub>DP</sub> D N]]. . .) that must be then sequentially lexicalized or further expanded. . . (Chesi, 2015:66).

However, when an expansion occurs where the selection features are not yet satisfied, as for the relative clauses in (263), a *nested phase* is begun. A nested phase “suspends the computation of the residual features in the superordinate phase” (ibid.:79), and it must be completely expanded before returning to the higher phase.

- (263) Adam gave a book [that had been bought by his wife [who visited the bookshop yesterday]] to Barbara. (ibid.:66)

Chesi distinguishes a nested phase, such as the relative clauses in (263), from a *sequential phase*, one that is introduced after the superordinate phase is complete; at this point, the superordinate phase will be closed and “forgotten” for the purposes of further operations.<sup>265</sup>

In this system, dependencies must either be satisfied within the same phase in which they have been introduced, or else inherited by a selected, sequential phase. This is accomplished via a memory buffer with the following characteristics:

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<sup>265</sup> This is the top-down equivalent of Chomsky’s (2001 [1999]) Phase Impenetrability Condition.



(264) *Content regulation of memory buffer*

- a. Every phase has its own memory buffer.
- b. The content of the memory buffer must be discharged through appropriate selection within the current phase or transferred to the memory buffer of the last selected phase.
- c. The memory buffer must be empty at the end of the derivation (success condition). (Chesi, 2015(22))

Given (264), long-distance dependencies are construed in this system as successive cyclic movements from superordinate phases to sequential phases. Note that subject, adjunct, and complex NP islands (Ross, 1985 [1967]) will all be nested phases, and thus the selection features of the superordinate phase cannot be discharged in these phases (given 264b), which Chesi notes derives island effects in at least these classes of islands.

Recently, den Dikken (2018:Chap. 2) has assessed both of these models critically, although the model he proposes is quite similar to Chesi's. For a derivation involving a long-distance filler-gap dependency, den Dikken's account is as follows (drawn from his §3.2): WH- phrases in bottom-up approaches are inserted in theta positions, and moved to positions in which their WH- features are checked. In a top-down derivation, Den Dikken proposes, a WH- phrase is instead inserted in the position which satisfies its WH- feature (which is also its scope position). However, it cannot be fully interpreted here, and so it produces a copy, which then moves to a theta position.

The first step in this process den Dikken refers to as "uploading a copy of the filler onto a pushdown stack." When an element is inserted into a position in which it

cannot fully be interpreted, it is added to a pushdown stack, which is similar to Chesi's (2007) memory buffer. The filler-copy is then downloaded to the edge of a node in what den Dikken refers to as a *predication structure*:

[T]he contents of pushdown stacks are *downloaded* onto the edge of the first predication structure encountered in the process of downward structure-building.

(den Dikken, *ibid.*:105)

The filler-copies are adjoined to a projection den Dikken calls a Relator Phrase (RP) (as proposed in den Dikken, 2006), such that the filler-copy downloaded first is adjoined higher than one downloaded later. In many cases, however, this is still not an interpretation site, in which case the grammar searches for a suitable site within the local domain, through a process den Dikken calls *tracing*. If this is successful, then we have a *direct* filler-gap dependency.

If this search is unsuccessful, it is either due to a strong island (e.g., an adjunct island) or a weak island (e.g., a WH- island). For the latter, this is due to an intervening element of the same type as the filler; for example, when the filler-copy of a WH- phrase is downloaded onto the edge of the same structure as another WH- phrase.<sup>266</sup>

The differences between the machinery involved in den Dikken's proposal and Chesi's appear to be relatively minor, and unlike Phillips, both attempt to incorporate phase theory into top-down structure building. However, I will admit that den Dikken (2018) was published and came to my attention rather late in the preparation of this

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<sup>266</sup> Den Dikken also discusses *re-uploading*, which applies to arguments only, and serves as a mechanism to avert the effects of weak islands in some cases.

manuscript,<sup>267</sup> and I have not had time to fully absorb it. I will therefore proceed in the next two sections to offer a sketch of my own preliminary top-down derivation model, one which should be functionally compatible, for the most part, with Chesi's and den Dikken's.

#### *5.4.3 The interpretive characteristics of phases*

In this section, I consider the relationship between the higher (CP) and lower (vP) phases in a simple sentence from the perspective of semantics. In §5.2.4, I argued that it is the precise formulation of Merge as a procedure that “takes two syntactic objects  $\alpha$  and  $\beta$  and forms the new object  $\gamma = \{\alpha, \beta\}$ ” (Chomsky, 2001:3) which implements the bias towards bottom-up structure building in the Minimalist Program (MP). But it does this (implicitly) in concert with another pillar of grammatical theory: Baker's (1988) Uniformity of Theta Assignment Hypothesis (UTAH), in which “identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure” (ibid.:46).<sup>268</sup> Although UTAH was couched in D-structure/S-structure terms, it was largely adopted into the MP with the understanding that it now referred to the positions in which items are introduced by External Merge.

In combining these two central features of the language faculty, we end up with a picture in which lexical items are inserted into standard structural positions within the tree; these positions uniformly assign thematic roles to DPs, which are then subsequently

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<sup>267</sup> It is therefore only incidentally mentioned in Merchant (2019b).

<sup>268</sup> See §1.3.1 above for assumptions of this derivation concerning UTAH.

displaced to higher positions where necessary for functional (Case, EPP<sup>269</sup>) or discourse-related reasons (Questions, Force, Focus), or for the purposes of scope. Generally speaking, it is these higher positions which 1) are language-specific and/or 2) interface with discourse-level features; the lower positions, or theta-positions, are (presumably) universal in both function and interpretation.<sup>270</sup>

A satisfactory division of labor follows arises from this. I submit that the vP layer is the locus of interpretation for the propositional core, consisting of the verb and all the arguments associated with the verb.<sup>271</sup> This is what I will call the *Simple Propositional Layer* (SPL) of the sentence. The higher shell, which is represented in the default case by CP and TP, consists of second-order information, in which the proposition is situated in time and modality and in the discourse context of the actual utterance of the proposition; I will refer to this as the *Functional/Discourse Layer* (FDL). In order to characterize these layers, I adopt the following definitions:

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<sup>269</sup> The EPP, or Extended Projection Principle (Chomsky, 1982), requires that the subject position of every clause be filled.

<sup>270</sup> At least at the level of generality represented by Dowty's (1991) proto-roles.

<sup>271</sup> An anonymous reviewer of Merchant (2019b) points out a complication with this generalization: in some theories, key features of interpretation are located outside the vP. Bianchi & Chesi (2014) argue that thematic subjects are interpreted in their theta positions at the interface, but that categorical subjects are interpreted in their derived position in the higher layer. The sort of "interpretation" that they seem to have in mind for categorical subjects, that of a presupposition of existence, seems to me to be additive with respect to the simple proposition; rather than being part of the interpretation of the proposition, the presupposition situates the proposition with respect to the discourse. Considering their (8a), *Firemen are altruistic*, the presupposition of the existence of firemen is the discourse-linked component, and the predication of altruism is the propositional component. Thus even if Bianchi and Chesi are entirely correct, I do not believe this to be an exception to the generalization that the *simple* proposition is interpreted within vP.

- (265) *Simple Proposition (SP)* : An interpretive complex consisting of a verb and its arguments, non-situated with respect to time and/or modality, in a non-language-specific configuration.
- (266) *Complex Proposition (SP)* : An interpretive complex consisting of a simple proposition, situated with respect to time, modality, and/or discourse, in a language-specific functional configuration.

In essence, a simple proposition, in which cognitively basic concepts<sup>272</sup> are arranged with respect to one another in a limited number of (non-linearized) configurations, is embedded into a layer that situates the simple proposition with respect to the larger discourse context, and thereby the force and modality of the proposition. To illustrate, consider (267a-e):

- (267) a. The President<sub>i</sub>  $T_{pres}$  [<sub>VP</sub>  $t_i$  eats steak with ketchup].  
 b. The President<sub>i</sub>  $T_{past}$  [<sub>VP</sub>  $t_i$  ate steak with ketchup].  
 c. The President<sub>i</sub>  $T_{pres}$  should not [<sub>VP</sub>  $t_i$  eat steak with ketchup]!  
 d. Which President<sub>i</sub>  $t_i$   $T_{pres}$  [<sub>VP</sub>  $t_i$  eats steak with ketchup]?  
 e. [Steak with ketchup]<sub>j</sub>, the President<sub>i</sub>  $T_{pres}$  [<sub>VP</sub>  $t_i$  eats  $t_j$ ]!!!

The basic proposition common to all these sentences is simply [*Det*] *President* [*eat*] *steak with ketchup*, and can be interpreted as such in all cases because of the uniformity of the structural positions in which the theta roles are assigned. In a strictly semantic

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<sup>272</sup> Presumably in the sense of Fodor (1998), although broaching that discussion here would take us too far afield.

sense, of course, sentences like (267a) and (267b) represent different propositions, as they have different truth conditions; one may be true while the other is false. By *simple proposition*, I refer merely to the non-time-situated proposition they have in common, i.e., ‘[Det] President [eat] steak with ketchup’. In (267a-e), this simple proposition is differently situated by the elements of the Functional/Discourse Layer: with respect to time by the Tense heads, with respect to modality in (267c) by the modal *should*, with respect to the discourse context in (267d-e) by the displacement of arguments into discourse positions, and in all cases with respect to language-specific features (here, the EPP)—by the displacement of the Agent into the derived subject position.<sup>273</sup>

The two domains of interpretation here are reminiscent of Chomsky’s (2007, 2008) discussion of the *duality of semantics*, and how Internal (IM) and External Merge (EM) correlate with the two aspects of interpretation, propositional and non-propositional:

[T]he two kinds of Merge should be expected to yield different interface properties. That is obviously true at the SM interface – the ubiquitous property of “displacement” – and appears to be true at CI as well. The two types of Merge correlate well with the duality of semantics. . . EM yields generalized argument structure, and IM all other semantic properties: discourse-related and scopal

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<sup>273</sup> Indeed, displacing an element for language-specific functional reasons is, in a certain sense, displacing it because of a “discourse context”: the context of the language in question. For an Irish-English bilingual, displacing the Agent into spec-TP occurs because the context is “English” (with presumably English-speaking interlocutors), whereas moving a verb to adjoin to T in Irish occurs because the context is “Irish.” Of course, these displacements are generally mandatory, whereas Topicalization (e.g.) is optional.

properties. The correlation is close, and might turn out to be perfect if enough were understood (Chomsky, 2007:10).

The Simple Propositional and Functional / Discourse layers I've characterized above correlate with EM and IM, in that (in a bottom-up theory), External Merge is responsible for introducing items into their theta positions, i.e., "generalized argument structure," and Internal Merge is responsible for displacement to discourse-related, functional, and scopal positions. In other words, the duality of semantics is represented not just in terms of the operations involved in structure building, but in the interpretive import of the two layers of the clause, whereby simple propositions become complex propositions. In the following section, I look at how the duality of semantics involved in these layers works in a top-down system.

#### *5.4.4 Towards a top-down, phase-theoretic model of sentence generation*

Given the fundamentally different nature of these two layers with respect to interpretation, it is not surprising that a wealth of phenomena point to a computational break between the construction of one and the construction of the other; this is the *phase boundary*. The interface between phases is known as the *phase edge*; this consists of the heads and specifiers of phase-triggering projections: CP and vP. When a phase edge is complete, everything but the edge is spelled out, i.e., submitted to the *sensorimotor* (SM) and CI systems for articulation and interpretation, respectively. At this juncture, the construction of another phase begins.

I demonstrate in this section that essentially this same infrastructure can be adopted in a top-down derivation; the key differences will be in what counts as an insertion site, and in the nature of syntactic movement. In this system, the FDL is (generally) the locus of Root *insertion*,<sup>274</sup> and the SPL the locus of Root *interpretation*. In the FDL, the insertion sites include 1) discourse positions (for DPs, spec-CP; for V, C<sup>0</sup>), and 2) language-specific, functional positions (for DPs, spec-TP; for V, T<sup>0</sup>). Roots are inserted from a lexical sub-array (LA) chosen phase-by-phase; the sub-array must be exhausted of non-null copies for a phase to be spelled out.<sup>275</sup> Note that the items inserted in these sites are not interpreted in these sites, but rather in the SPL. I refer to such items as *propositional elements*:

(268) *Propositional element (PE)* : the main verb of a clause, or one of its arguments, or a null copy of either.

PEs are inserted along with *Theta-Features*, drawn from a limited universal set of possible thematic relations: Agent, Experiencer, Theme, etc. If a speaker intends to utter a sentence in which *John* is the Agent, i.e. the “do-er” of the action, *John* will be inserted

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<sup>274</sup> Except for internal arguments, which in the default case are inserted in the SPL, either as complements to the verb or in an AgrO or Asp projection (for theories in which accusative Case is assigned there). By *root insertion*, I mean taking an element from the lexical array and inserting it into a node in the tree. I assume these roots are abstract in the sense that they have syntactic and semantic features but no phonological content, i.e., that they are N-Roots in the sense of Chapter 4. I am of course leaving a great deal out of this picture, such as how DPs are constructed, whether they constitute phases, etc.

<sup>275</sup> See Richards (2011) for related arguments. Richards argues in part for an approach in which the notion “phase head” is epiphenomenal, and phases are defined in terms of the exhaustion of an LA.



as [John<sub>AGENT</sub>]; if *John* is to be the Theme, i.e. the “undergo-er,” it will be inserted as [John<sub>THEME</sub>]. The AGENT feature can be checked only in a specifier-head configuration in the vP, and the THEME feature only in a head-complement configuration in the VP.<sup>276</sup> To accomplish this, we need movement; not of the PEs themselves, but of their null copies, or *twins* (c.f. “trace”):

(269) *Twin (t)*: A semantically complete copy of a propositional element.<sup>277</sup>

Twins are created wherever a propositional element is inserted outside of its interpretive position (for Chesi, 2007, this is an “unselected” position). If a PE is inserted directly in a theta position (such as will frequently be the case with Theme arguments), it can immediately check its theta-feature, and no twin is produced. If, however, it is inserted in a non-theta-position (anywhere in the FDL except the phase edge), it produces a twin, which then inherits its theta-feature. This twin is added to LA, then inserted at the phase edge, which acts as a data buffer between the FDL and the SPL.<sup>278</sup> In the SPL, the twin reaches its theta position and checks its theta-feature.

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<sup>276</sup> One might object that this picture involves an unnecessary “doubling” of theta features. However, this is no different from, say, WH- movement in a bottom-up model, in which a WH-word with a +WH feature is merged in a theta position only to be displaced in order to move to a specifier-head configuration with a +WH complementizer. The doubling of WH features here is what ensures this movement. I am proposing here that in a top-down derivation, this doubling of theta-features is what triggers movement from a functional or discourse position (such as spec-CP) to a theta position. In this model, “theta-assignment” happens at Numeration, consistent with a speaker’s intentions, not in a theta position (as in a bottom-up model). Rather, movement to a theta position happens for the purpose of propositional interpretation only.

<sup>277</sup> As I am assuming the post-syntactic insertion model described in Chapter 4 here, adding “phonologically null” would be redundant.

<sup>278</sup> As described in §5.4.1, Chesi (2015) uses a Memory Buffer separate from the LA, with the same basic restrictions (ibid.:80) as I ascribe to LAs, i.e., that each phase has its own memory buffer, and that for a phase to be spelled out, the content of the memory buffer must either be

This is where UTAH comes in (rather, its gritty reboot, *UTCH*):

(270) *UNIFORMITY OF THETA-CHECKING HYPOTHESIS (UTCH)*:

Identical thematic relationships between propositional elements ( $PE_x$ ) and ( $PE_y$ ) in sentences  $X$  and  $Y$  are represented by identical structural relationships between the respective copies of ( $PE_x$ ) and ( $PE_y$ ) at the level at which  $X_{VP}$  and  $Y_{VP}$  are transferred to the interfaces.

Feature-checking for a given theta role (e.g., THEME) will therefore always occur in the same structural configuration with respect to the verb; in a sense, this configuration *is* the (simple) proposition (for a transitive verb). In this model, UTAH/UTCH is the end goal of a derivation, one which begins with propositional elements scattered throughout the FDL. In other words, a derivation is a procedure that takes discourse-related elements arranged in a language-specific configuration and rearranges them into this universal configuration for the purpose of propositional interpretation; in this sense, both the SM and CI systems are satisfied.

#### 5.4.5 *A top-down, late insertion derivation*

In this section, I present a full derivation which combines the top-down structure building sketched out in §5.4.4 with the postsyntactic phonological insertion of Chapter 4. The

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exhausted or transferred to the memory buffer of a sequential phase. However, he assumes that copies are transferred directly to the memory buffer, with no need to remerge them at the phase edge. The assumption that they must be remerged at the edge is standard in mainstream phase theory, however, and I think may be necessary to account for WH islands (see §5.5).

provisional model that arises from this interaction I will refer to as *Late Insertion, Top-Down (LIT-D)*, to differentiate it from models involving other settings of the meta-parameters: *Late Insertion, Bottom-Up (LIB-U)*, *Early Insertion, Top-Down (EIT-D)*, and *Early Insertion, Bottom-Up (EIB-U)*.<sup>279</sup> The sentence I will derive will be that in (271):

(271) [Which book about himself]<sub>i</sub> did John<sub>i</sub> despise *t<sub>j</sub>*?

The derivation of (271) is as follows. For the sake of exposition, I assume that the DP *which books about himself* is preconstructed in a separate workspace, along the lines of Nunes and Uriagereka (2000); however, it might also be treated as a nested phase, as in Chesi (2015).<sup>280,281</sup>

**STEP ONE:** *Numeration of LA<sub>FDL</sub>.*

A lexical sub-array of the roots to be inserted in the FDL is enumerated; corresponding to the communicative intent of the speaker, the theta-feature <sub>AGENT</sub> is assigned to  $\sqrt{John}$ , and the theta-feature <sub>THEME</sub> is assigned to the DP *which books about himself*. The lexical array LA<sub>FDL</sub> is as follows:

LA<sub>FDL</sub>: <C<sub>[+WH, +Q]</sub>; T<sub>past</sub>;  $\sqrt{John}$ <sub>i/AGENT</sub>;  $\sqrt{despise}$ <sub>k</sub>;  
[*which book about himself*]<sub>j/THEME</sub>>

**STEP TWO:** *CP → spec-CP, C'.*

The root node (CP) branches into a specifier position (on the left) and a bar-level projection (C'). The DP *which book about himself* is inserted into spec-CP, along with the feature <sub>THEME</sub>. As this is not a theta-position where <sub>THEME</sub> can be checked, a twin, *t<sub>j</sub>*, is produced, and added to LA<sub>FDL</sub>. This twin inherits the <sub>THEME</sub> feature. The syntactic object SO and lexical array LA<sub>FDL</sub> are now as follows:

<sup>279</sup> I will have more to say about the differences between these models in Chapter 6, when I consider the future directions of the research program stemming from this dissertation.

<sup>280</sup> If this DP is a nested phase, we might also want to argue that it is spelled out before the construction of the superordinate phase continues.

<sup>281</sup> Note also I am assuming an N-Root  $\sqrt{John}$ , and do not intend to open the can of worms involved in the lexical semantics of proper nouns. This is a problem for early insertion theories as well, of course.

SO: [CP [DP *which book about himself*] C']

LA<sub>F</sub>DL: <C<sub>[+WH, +Q]</sub>; T<sub>past</sub>;  $\sqrt{\text{John}}_{i/\text{AGENT}}$ ;  $\sqrt{\text{despise}}_k$ ;  $t_j/\text{THEME}$ >

**STEP THREE:**  $C' \rightarrow C, TP$ .

Here C' branches into C<sup>0</sup> and TP, and the complementizer C<sub>[+WH, +Q]</sub> is inserted into C<sup>0</sup> (to be realized as 'did' at the SM interface).

SO: [CP [DP *which book about himself*] [C' [C<sub>[+WH, +Q]</sub>] TP]]

LA<sub>F</sub>DL: T<sub>past</sub>;  $\sqrt{\text{John}}_{i/\text{AGENT}}$ ;  $\sqrt{\text{despise}}_k$ ;  $t_j/\text{THEME}$ >

**STEP FOUR:**  $TP \rightarrow \text{spec-TP}, T'$ .

Now TP branches into spec-TP and a bar-level projection (T'). In the specifier, we insert the DP  $\sqrt{\text{John}}_{i/\text{AGENT}}$ , along with the feature AGENT. As this is not a theta-position where AGENT can be checked, this DP produces a twin:  $t_i$ ; this is added to LA<sub>F</sub>DL. This twin inherits the AGENT feature.

SO: [CP [DP *which book about himself*] [C' [C<sub>[+WH, +Q]</sub>] TP [[DP  $\sqrt{\text{John}}_i$ ] T']]]

LA<sub>F</sub>DL: T<sub>past</sub>;  $\sqrt{\text{despise}}_k$ ;  $t_j/\text{THEME}$ ;  $t_i/\text{AGENT}$ >

**STEP FIVE:**  $T' \rightarrow T, vP$ .

The bar-level projection (T') then branches into T<sup>0</sup> and vP, and the tense head T<sub>past</sub> is inserted into T<sup>0</sup>.

SO: [CP [DP *which book about himself*] [C' [C<sub>[+WH, +Q]</sub>] TP [[DP  $\sqrt{\text{John}}_i$ ] T' [[T<sub>past</sub>] [vP]]]]]

LA<sub>F</sub>DL:  $\sqrt{\text{despise}}_k$ ;  $t_j/\text{THEME}$ ;  $t_i/\text{AGENT}$ >

**STEP SIX:**  $vP \rightarrow \text{spec-vP}, v'$ .

Now begins the construction of the phase edge, where vP branches into a spec-vP and a bar-level projection (v'). The AGENT twin ' $t_i/\text{AGENT}$ ' is inserted into spec-vP. This is its theta-checking position, so no new twin is produced.

SO: [CP [DP *which book about himself*] [C' [C<sub>[+WH, +Q]</sub>] TP [[DP  $\sqrt{\text{John}}_i$ ] T' [[T<sub>past</sub>] [vP  
[[DP  $t_i/\text{AGENT}$ ] [v']]]]]]]]

LA<sub>F</sub>DL: < $\sqrt{\text{despise}}_k$ ;  $t_j/\text{THEME}$ >

**STEP SEVEN:**  $v' \rightarrow v, VP$ .

At this point,  $v'$  branches into  $v^0$  and VP, and  $\sqrt{despise}_k$  is inserted into  $v^0$ . This is not its interpretive position, however, so a twin  $t_k/VERB$  is produced, and added to  $LA_{FDL}$ .

SO:  $[_{CP} [_{DP} \textit{which book about himself}] [_{C'} [_{C[+WH, +Q]}] TP[[_{DP} \sqrt{John}_i] T'[[_{T_{past}}] [_{vP} [[_{DP} t_i/AGENT] [_{v'} [_{v} \sqrt{despise}_k] [_{VP}]]]]]]]]]$

$LA_{FDL}$ :  $\langle t_k/VERB; t_j/THEME \rangle$

**STEP EIGHT:** *Transfer of FDL to the interfaces.*

The phase edge, consisting of the specifier and head of vP, is complete, and so the structure created in the FDL (minus the phase edge) is sent off to the interfaces.<sup>282</sup> This leaves only twins to be inherited by the lower phase, i.e., transferred from  $LA_{FDL}$  to  $LA_{SPL}$ ; the only N-Root that has not been expounded<sup>283</sup> at this juncture is  $\sqrt{despise}$ , as it was inserted at the phase edge. Note that only null copies can be inherited by the LA of a lower phase; the first copy of a chain of twins is always *pronounced* in its insertion site,<sup>284</sup> even though it will be *interpreted* (with respect to the simple proposition) in a lower position.<sup>285</sup>

<sup>282</sup> In this derivation, I assume the twins left in  $LA_{FDL}$  are transferred directly to  $LA_{SPL}$ , ignoring the question of whether they must first be remerged at the phase edge (in den Dikken's (2018) terms, whether they are downloaded and then uploaded again). If indeed they must be remerged, we have a problem, as the Agent twin occupies spec-vP, and there is no intermediate landing site for the Theme twin. Possible solutions include positing that vP has multiple specifiers (as sometimes proposed for CP, e.g., Lahne, 2009), or that a separate v-type projection such as VoiceP dominates vP and is also part of the phase edge (as Rizzi, 1997, proposes for CP, and Labelle & Doron, 2010, propose for vP). Standard phase theory, of course, has the same problem when a Theme WH- DP needs to escape vP.

<sup>283</sup> That is, the only abstract root that has not been realized by a phonological exponent; see §4.4.

<sup>284</sup> As for postverbal subjects in (e.g.) Romance, I assume that they are inserted into spec-vP and remain *in situ*, and are spelled out when the SPL is complete (along with any VP-internal object). However, the *in situ* analysis is not universal; Zubizarreta (1998) argues that they occupy a position outside VP; see Gupton (2010) for discussion.

<sup>285</sup> I do not consider Quantifier Raising (QR) here (May, 1977, 1985; Fox & Nissenbaum, 1999), but note that although quantifiers may sometimes be interpreted higher than their insertion positions for purposes of scope, they are interpreted with respect to the simple proposition within vP. For a top-down look at QR phenomena, see Bianchi & Chesi (2010).

SO: [CP [DP *which book about himself*] [C' [C *did*] TP [[DP *John* <sub>i</sub>] T' [[T<sub>past</sub>] [VP  
[[DP *t<sub>i</sub>/AGENT*] [V' [V  $\sqrt{\text{despise}}_k$ ] [VP]]]]]]]]]  
LA<sub>FDL</sub>: <*t<sub>k</sub>/VERB*; *t<sub>j</sub>/THEME*>

**STEP NINE:** *Numeration of LA<sub>SPL</sub>.*

In this case, no overt elements are enumerated in LA<sub>SPL</sub>, although in principle, any number of elements could be added here. Only the twins inherited from the FDL are in the subarray:

SO: [CP [DP *which book about himself*] [C' [C *did*] TP [[DP *John* <sub>i</sub>] T' [[T<sub>past</sub>] [VP  
[[DP *t<sub>i</sub>/AGENT*] [V' [V  $\sqrt{\text{despise}}_k$ ] [VP]]]]]]]]]  
LA<sub>SPL</sub>: <*t<sub>k</sub>*; *t<sub>j</sub>/THEME*>

**STEPS TEN and ELEVEN:** *VP* → *spec-VP*, *V'*; *V'* → *V*, *DP*.

The construction of the SPL begins with VP, which branches into spec-VP, and a bar-level projection (*V'*).<sup>286</sup> Then *V'* branches into *V*<sup>0</sup> and DP, and the twin of the verb (*t<sub>k</sub>/VERB*) is inserted into *V*<sup>0</sup>.

SO: [CP [DP *which book about himself*] [C' [C *did*] TP [[DP *John* <sub>i</sub>] T' [[T<sub>past</sub>] [VP  
[[DP *t<sub>i</sub>/AGENT*] [V' [V  $\sqrt{\text{despise}}_k$ ] [VP [V' [V *t<sub>k</sub>/VERB*] [DP]]]]]]]]]]]  
LA<sub>SPL</sub>: <*t<sub>j</sub>/THEME*>

**STEP TWELVE:** *Transfer of SPL to the interfaces.*

Here the twin of the WH- phrase (*t<sub>j</sub>/THEME*) is inserted into the DP node. This is its theta-checking position, so no new twins are produced. LA<sub>SPL</sub> is now exhausted, and so the structure is transferred to the interfaces; where the N-Root  $\sqrt{\text{despise}}_k$  is expounded by the E-Root *despise*, and the derivation is complete.

SO: [CP [DP *which book about himself*] [C' [C *did*] TP [[DP *John* <sub>i</sub>] T' [[T<sub>past</sub>] [VP  
[[DP *t<sub>i</sub>/AGENT*] [V' [V *despise*<sub>k</sub>] [VP [V' [V *t<sub>k</sub>/VERB*] [DP [*t<sub>j</sub>/THEME*]]]]]]]]]]]  
LA<sub>SPL</sub>: < >

<sup>286</sup> I assume vacuous branching here, but nothing turns on it; if no roots are to be inserted into spec-VP in a given derivation, then no specifier position or bar-level projection is strictly necessary.

Note that the anaphor's twin is now at the foot of a chain and in place for Binding Condition A to apply, at "the outer edge of the C-I interface" (Chomsky, 2008:8).

### *5.5 Island phenomena and concluding remarks*

The brief sketch presented thus far should hopefully demonstrate that at least some of the machinery of bottom-up approaches can be incorporated into top-down derivations; it is of course an open question whether other elements of the theory can be similarly incorporated.<sup>287</sup> This awaits further research, but my contention is that any syntactic mechanism that can be described in a bottom-up system powered by Merge can be described in a top-down system powered by Branch. For example, WH- islands can be accounted for in terms of the interaction between the buffer (see also fn. 51) and the lexical sub-arrays, where the "island" is a restriction on adding a WH- element to the LA where the buffer already contains one. Consider the partial derivations of (272a) and (272b) in (272c-f):

(272) a. \* Which dog did Mom think who adopted?

b. Which dog did Mom think Ed adopted?

Step (i):        [which dog]<sub>i</sub> did Mom think [CP. . . .

LA<sub>SPL</sub>: *t<sub>i</sub>*

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<sup>287</sup> For one thing, we need a theory of how linearization works top-down, whether it is an artefact of the SM interface (as assumed in much of Chomsky's work, e.g., Berwick & Chomsky, 2016) or is specified in narrow syntax per Biberauer, Holmberg, & Roberts (2009). I assume that it is probably calculated cyclically, perhaps along the lines of Pesetsky & Fox (2005), although this will of course look somewhat different in a top-down derivation.

Step (iia)      [**which dog**]<sub>i</sub> did Mom think [<sub>CP</sub> *t<sub>i</sub>* . . .

LA<sub>FDL</sub>: √Ed<sub>j</sub> √adopted

Step (iib):      \*[**which dog**]<sub>i</sub> did Mom think [<sub>CP</sub> *t<sub>i</sub>* . . .

LA<sub>FDL</sub>: \*√who<sub>j</sub> √adopted

Step (iia):      [**which dog**]<sub>i</sub> did Mom think [<sub>CP</sub> *t<sub>i</sub>* [<sub>TP</sub> Ed<sub>j</sub> [<sub>VP</sub> *t<sub>j</sub>* adopted*t<sub>i</sub>* ]]]

In Step (i), *t<sub>i</sub>* (the null copy of [*which dog*]<sub>i</sub>) is the last remaining element from the previous LA, and can now be remerged into the specifier of the embedded CP, which is part of the phase edge. In the case in Step (iib) where *who* is chosen for LA<sub>FDL</sub> (the sub-array for the embedded CP), its only possible insertion site is already occupied. As a result, the derivation will crash, as LA<sub>FDL</sub> will never be exhausted if *who* cannot be inserted.<sup>288</sup> In Step (iia), however, we see that choosing a DP without a WH feature allows its insertion in spec-TP, and the movement of its twin to spec-vP for propositional interpretation in Step (iia). The result of this is that when a WH element (or one of its copies) is inherited by another phase, other WH elements cannot be added to the same LA; this has the flavor of a general restriction on lexical sub-arrays.<sup>289</sup>

Other island phenomena will hopefully yield to successful top-down analyses, and indeed Chesi, den Dikken, and others have made significant progress in this regard. Ideally, of course, island phenomena should be reducible to general computational

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<sup>288</sup> The derivation will crash for an additional reason, as *who* will be enumerated along with the feature [<sub>AGENT</sub>], a feature that is then stranded in LA and never introduced into the structure. The proposition associated with the embedded vP will be uninterpretable without this feature (i.e., without a copy of the Agent in spec-vP).

<sup>289</sup> For languages which allow overt raising of multiple WH- phrases (e.g., Bulgarian; see §5.3.2), this analysis would have to be modified.



constraints, the goal being for the theory to “deliver the ‘syntactic archipelago’ on a silver plate” (den Dikken, 2018:103). I leave elaboration of this model, along with the incorporation of other components of the grammar, to future work. I hope to have planted a seed, however, and I do think we shall see in the end that trees grow from their roots, not their leaves.

## CHAPTER 6: CONCLUSION

### 6.1 Overview

In this dissertation, I have considered two fundamental questions about the architecture of the grammar, arguing that in order for linguistic theory to be interpretable at its interfaces with other disciplines in the cognitive sciences, we must first have answers as to the proper settings of what I refer to as *meta-parameters*: parameters not of variation between human languages, but rather of variation with respect to how formal systems might be biologically instantiated.<sup>290</sup> The first meta-parameter concerns the timing of phonological insertion; does the computational component of the grammar operate on “words” with associated phonological content, or on abstract roots? The second meta-parameter concerns the directionality of derivations: are sentences generated by a series of incremental applications of Merge, beginning with the most deeply embedded terminals, or by incremental applications of Branch, beginning with the root node of a structure?

In Chapters 2 to 4 above, I have sought to demonstrate that a close analysis of the syntactic and semantic properties of phrasal idioms leads to the conclusion that their phonological forms are not present in narrow syntax. Idioms such as *kick the bucket*, *buy*

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<sup>290</sup> Thus although I have argued here that the human language faculty is set to Late Insertion and Top-Down, a language spoken on (e.g.) the exoplanet Proxima Centauri b might have different settings with respect to these or other meta-parameters. What we refer to as Universal Grammar might therefore not be truly universal, as other biological instantiations may be possible; I see this as an empirical issue for which data are not likely to be available in the near future.

*the farm*, and *bite the dust*, I have argued, represent phonological exponents (Roots-as-exponents, or E-Roots) inserted into unaccusative structures, in which the argument in subject position bears an internal theta role: Proto-Patient, in Dowty's (1991) terms. If this is so, then the pronounced components of an idiom cannot be the representation involved at the level of the derivation at which theta role assignment occurs, as no theta role would be available for *the farm* / *the bucket* / *the dust*.

The impetus for this analysis, then, came in part from theta-theoretic considerations, but also from the observation that idioms vary in their syntactic mobility, i.e., the extent to which their figurative interpretations are available in varying syntactic configurations; this was the focus of Chapter 2. In (2a), repeated here as (273a), we can assign *bought the farm* either a figurative or a literal interpretation, but in (2b-c), repeated as (273b-c), only the literal interpretation is available:

- (273) a. [ID/LIT] The old man finally bought the farm.  
       b. [\*ID/LIT] The farm was finally bought by the old man.  
       c. [\*ID/LIT] I was sad to hear about the farm which the old man bought.

Once we assume postsyntactic insertion of phonological exponents, we can easily account for why *buy the farm*, along with *bite the dust* and *kick the bucket*, cannot passivize, relativize, etc. Neither *the farm*, nor *the dust*, nor *the bucket* is present in the derivation until after such operations apply, and so they're not subject to displacement. Under this account, the derivations for *kick the bucket* and *die* are identical, with precisely isomorphic structure-building up to the point of postsyntactic phonological

insertion, when either the literal or the figurative exponent can be chosen. Both derivations are disjunct, however, from derivations involving *kick the [literal] bucket*, a transitive predicate with an external theta role to assign.

In addition, I argued in Chapter 2 that the normal interpretations associated with an idiom's phonological components under a literal reading are inert in the context of sentence generation. I formalized this as the Principle of Semantic Inertness in (86), repeated here as (274):

- (274) *Principle of Semantic Inertness (PSI): Only the intended conceptual structure of a predicate is relevant to the computational and interpretive component of the grammar; other conceptual structures associated with the same phonological forms are semantically inert in the context of language production.*

Apparent counterexamples to this principle proposed by Arseneault (2014) and Egan (2008) include *figurative extensions*, in which the normal interpretations of an idiom's phonological components under a literal reading are explicitly referred to in the surrounding context in which an idiom is used. I argued in §2.4 that such cases represent instances of metalinguistic creativity, a self-conscious process by which elements of the object language are exploited (usually for humorous effect).<sup>291</sup> Such metalinguistic

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<sup>291</sup> For recent examples of this, see the *New Yorker* article “Idioms Updated for Climate Change” (Hogan, 2019), which includes metalinguistic extensions such as “You can lead a horse to a dried-up reservoir, but you can't make it drink dirt” (ibid.:25).

extensions, I argued, are motivated neither by the unconscious machinery of the grammar, nor by normal communicative intent.

Converging evidence for postsyntactic insertion came also from a close analysis of the aspectual properties of idioms. In Chapter 3, I demonstrated that inner aspect in idioms is compositional with respect to the components of an idiom's figurative interpretation, *not* with respect to the literal meanings of its phonological components (contra McGinnis, 2002, 2005). For example, note that *kick the bucket* and *kick the habit* involve the same verb and a definite, singular DP with a count noun. If they were compositional with respect to the literal meanings of their phonological components, they should evince the same aspectual properties. Instead, they show clear differences with respect to other elements with which they can co-occur: *kick the habit* in (3a) (repeated here as (275a) is acceptable with the progressive, but *kick the bucket* in (3b) (~275b) is not. Conversely, *kick the bucket* can co-occur with a punctual adverbial (276a), but *kick the habit* cannot (276b):

- (275) a. [ID] John was kicking the habit that summer.  
       b. [ID] \*John was kicking the bucket when we arrived.
- (276) a. [ID] John kicked the bucket at midnight last night.  
       b. [ID] \*John kicked the habit at noon yesterday.

If the phonological components of an idiom are present in narrow syntax only to have their meanings erased by an interpretive rule, as suggested in Chomsky (1980), nothing prevents durative *kick the habit* from occurring with a punctual adverbial, or punctual

*kick the bucket* from occurring with the progressive. If, however, the phonological forms of these idioms are inserted postsyntactically into contexts that are already either durative or punctual, we can account in a straightforward manner for their distribution. I provisionally accounted for this in Chapter 3 by assuming an inner aspect projection AspP (along the general lines of a proposal by MacDonald, 2008b), which must be aspectually nondistinct from other sentential elements with respect to telicity, durativity, and dynamicity.

Based on the results of these investigations, I proposed in Chapter 4 a model of the grammar in which there is not one syntax-lexicon interface, but rather two. The first interface I refer to as *Root Insertion* (R-Insertion); this is a process by which abstract Roots-as-nodes are chosen from the lexicon, enumerated in a lexical array, and incrementally inserted into a structure as it is being built. The second lexical interface I refer to as *Phonological Insertion* (P-Insertion); this occurs after the derivation diverges, with one branch going to the interpretive component and the other to the phonological component. In P-Insertion, the phonological forms of Roots-as-exponents (E-Roots) are inserted where their features are nondistinct from those of the abstract Roots-as-nodes (N-Roots) in the structure.

Note that although I refer to both of these interfaces as “lexical interfaces,” the lexical items they insert into a structure are not identical, and therefore the *lexicon* as such is not unitary, but rather distributed. The first component of this lexicon is what in Distributed Morphology is referred to as List 1; it is composed of abstract roots with semantic and syntactic features. At P-Insertion, the second component of the lexicon (List 2) is consulted, and here a speaker may choose to insert any form whose syntactic and

semantic features match all or a subset of the features of the root that already exists in the derivation. This may include a phrasal idiom such as *kick the bucket*, or a simple verb like *die*. I proposed in §4.4.2-3 that unlike simple verbs like *die*, idioms are *complex E-Roots*, offering the following definition for *idiom* in (227) (repeated here as (277)):

- (277) *Idiom*: A complex Root-as-exponent (E-Root), with one or more semantic components corresponding to one or more components of its phonological exponent, some of which may be inserted noncontiguously but all of which must be inserted simultaneously.

In this model, idiomaticity is a phenomenon associated with externalization only, imposed by the interface with the sensory-motor (SM) system.<sup>292</sup> As with phonological form generally, idiomaticity is irrelevant to both the computational component and the conceptual-intentional (CI) system, which require only syntactic and semantic features. This accords with the modern biolinguistic perspective, as in Berwick and Chomsky (2016:40), who write that the SM is “like the printer attached to a computer, rather than the computer’s CPU.”

In Chapter 5, I considered the other meta-parameter, which concerns the directionality of derivations. I argued there that if we view the grammar as an abstract model of the cognitive system we call language, other cognitive systems on which language necessarily depends cannot be extraneous to understanding its operation, and

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<sup>292</sup> Thus the title of this dissertation—*Idioms at the Interface(s)*—includes parentheses around the second plural, as although I consider both lexical interfaces here, my contention is that idiomaticity is a phenomenon associated only with the second lexical interface.

thus must be addressed even when considering language as an abstraction. Given this conclusion, I proceeded to look at the literature on limitations on temporary memory capacity, and consider how language production might be affected by these limitations, noting that for extremely long sentences, some “forgetting” is necessary in order for the system to operate. This “forgetting” is built into the version of the Minimalist Program (MP) known as *phase theory* (Chomsky 2001 [1999], 2008, etc.), which works on subsets of a derivation and cyclically transfers them to the interfaces, thus reducing the computational burden involved in generating a lengthy sentence. However, in the MP, this “forgetting” proceeds from the bottom-up, with the subsets of the sentence spoken *last* being the ones processed *first*, which I argued is simply not credible from a psycholinguistic perspective. I then looked at the operation Merge, which is the main generative engine in a bottom-up system, and contrasted it with the operation Branch, the analogue of Merge in a top-down system, arguing that the latter is far more plausible from the theory-external perspective considered here.

We are left, then, with top-down derivations as a desideratum. My preliminary research in this area has been published in squib form (Merchant, 2019b), on which I expanded somewhat in §5.4, incorporating the postsyntactic insertion model laid out in Chapter 4. In this combined model, derivations constructed by iterative Branch proceed top-down, with the cyclic transfer to the interfaces associated with phase theory. N-Roots are (generally) inserted and subsequently spelled out in language-specific functional and discourse sites (CP, TP). Copies of these N-Roots, which I refer to as *twins*, are inherited by the lexical subarray associated with the lower phase from the lexical subarray associated with the higher phase; this serves as a memory buffer between the phases.



These copies are thus displaced into the propositional layer (i.e., vP), where their theta-features are checked in local configurations. In this model, the equivalent of the Universal Theta-Assignment Hypothesis (UTAH; Baker, 1988) represents the end goal of a derivation, rather than its initial state.

In the remainder of this chapter, I lay out some limitations of the model proposed here, and discuss future research directions.

## *6.2 Limitations of this dissertation; further research*

In this section, I discuss some of the limitations of the research I've presented in this dissertation, as well as some possible directions for future study.

### *6.2.1 The syntactic and aspectual properties of phrasal idioms*

Although I considered a fairly wide range of idioms in this dissertation, in almost all cases they were drawn from English. The chief reason for this is simply that it is the only language in which I am fluent (or even close to fluent). Due to the subtleties involved in acceptability judgements generally, and in idioms specifically, I chose to limit my initial analysis to a language in which I could easily manipulate the material and consult my own judgements, as well as those of other native speakers. I have somewhat informally consulted speakers of Spanish and German on idioms in those languages that mean approximately 'die', and to date I know of no evidence that these idioms can appear in

the passive; this is however merely anecdotal, and so is largely unreported here. Going forward, this is an obvious direction for further rigorous research.

I will note here, however, some of the general difficulties with obtaining acceptability judgements on idioms. First, as many idioms are plausible under a literal reading, the necessary judgements are not grammaticality judgements per se, but rather judgements about whether a figurative interpretation is available, which is quite a bit more subtle of a question. In the domain of language comprehension (on which acceptability judgements depend), I suspect that there is frequently interference from the acceptability of the literal interpretation of an idiom, particularly for literally plausible idioms.<sup>293</sup> Therefore *the bucket was kicked* will not necessarily sound bad, even to a speaker who would never produce it. This is a problem which must be carefully controlled for, as although linguists are trained to keep multiple readings of the same form separate when considering its acceptability, most speakers are not.

A second difficulty with obtaining acceptability judgements on idioms was discussed in §2.6. Language performance is not a fully unconscious process, as speakers have metalinguistic awareness of the forms they produce, and are able to consciously manipulate them for humorous or aesthetic effect. I therefore agree with Schenck (1995:257-58), who argues that “the ability of people to play with words is outside the scope of a theory of idioms proper.” It is not entirely clear how to draw the line between “normal” and “metalinguistic” uses of idioms, however. At present, I cannot do much

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<sup>293</sup> I have of course claimed in the above that there is not interference in the context of sentence generation in language *production*.

better than former Supreme Court Justice Potter Stewart, who wrote in *Jacobellis v. Ohio*<sup>294</sup> the following about hard-core pornography:

I shall not today attempt further to define the kinds of material I understand to be embraced within that shorthand description [hard-core pornography], and perhaps I could never succeed in intelligibly doing so. But I know it when I see it, and the motion picture involved in this case is not that.

Metalinguistic language may be no different; indeed, I'm not certain as to whether a distinction can be clearly drawn. At the very least, one would need a theory of pragmatics, a theory of humor, and a theory of verbal aesthetics, in addition to a theory of the grammar, and would need to offer a careful analysis of how these modules interact.

Another limitation of this study has been my focus on acceptability in the passive as the main diagnostic for the syntactic mobility of idioms. Part of the reason for my focus on this is that it is one of the better-understood and more widely-agreed upon transformations. Relatively few of the transformations posited in the *Syntactic Structures* and *Aspects* (Chomsky, 1957, 1965) periods have survived unscathed, but I think most syntacticians would agree that the passive involves raising of an internal argument to subject position, which is fundamentally the same insight as is present in *Syntactic Structures*. Perhaps for this reason, much of the discussion in the literature on syntactic mobility in idioms begins (and sometimes ends) with the passive.

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<sup>294</sup> *Jacobellis v. Ohio*, 378 U.S. 184 (1964).

However, it may be that idioms show a wider range of syntactic mobility than my analysis here assumes. For Fraser (1970), there are at least six classes of idioms in this respect. Attempting to account for this apparent heterogeneity in the modern theoretical context would certainly be a worthwhile undertaking,<sup>295</sup> although I suspect that many of these distinctions are illusory, or artefacts of how transformations were formulated at the time. My analysis here incorporates the work of Newmeyer (1974), Nunberg et al. (1994), Jackendoff (1997), and Horn (2003), among others, but I think one could go a lot further in this direction; I believe that Horn's *thematic composition* is on the right track, and if there is more heterogeneity than I assume, it is probably due to variation in theta role assignment.

Finally, although I think that the aspectual model I adopt (largely based on Olsen, 1997) is descriptively correct with respect to the data, and is effective in accounting for which inherent aspectual properties of verbs are semantic and which are pragmatic implicatures, I remain open to the possibility that the three-feature system that Olsen proposes is not the whole picture, and that something like Pustejovsky's (1991) layered lexical semantics, where event structure (the locus of aspectual distinctions) is just one component, may be correct. To my knowledge, Chapter 3 of this dissertation is the most in-depth consideration of the aspectual properties of idioms that exists,<sup>296</sup> but I think much more remains to be explored on this topic, particularly with respect to outer/grammatical/viewpoint aspect.

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<sup>295</sup> As noted above (fn. 23), Nuger (2016:218) reformulates this hierarchy in Distributed Morphology terms, replacing (e.g.) L5's "Permutation" with "Category Changes."

<sup>296</sup> MacDonald (2008b:Chap.4) is also quite in-depth, although its focus is mostly on the syntax of inner aspect.

### 6.2.3 *Late Insertion, Top-Down (LIT-D)*

In Chapters 4 and 5, I proposed a model in which syntactic structures consisting of abstract roots are built top-down by iterative Branch and cyclically transferred to the interfaces, with phonological exponents added postsyntactically at the level of Phonological Form. As noted above, I refer to this model as *Late Insertion, Top-Down (LIT-D)*. Unlike the extensive consideration of the data that preceded it, much of this model is preliminary, and much remains to be fleshed out. In this section, I note only a few of the many remaining issues.

For Chapter 4, the main point of concern for some might be my arguments that idioms which are syntactically mobile have multiple semantic components, which therefore allow them to be syntactically mobile, and that idioms which only appear in punctual environments therefore have punctual semantic components, which constrain them from appearing in nonpunctual environments. One might therefore object that these are merely “just so” stories, stipulations, or even cases of circular reasoning (e.g., the idiom has a punctual semantic component because the theory needs it to). Given that my claim that *kick the bucket* has a punctual semantic component is drawn from empirical observations (see §3.4.3 above), and that the claim that *kick the bucket* otherwise has the same semantic representation as *die* because it has the same *meaning* as *die* is almost a tautology, I don’t really think such objections hold water. My claim is that these semantic representations drive the syntactic behavior of these idioms precisely because the semantic representations are what’s processed by the syntax, not the idioms themselves.

As to whether this model is tenable in other respects, that will be an empirical question. For idioms, the question will be that if a component such as *the bucket* in *kick*

*the bucket* is not present in narrow syntax, how are Case, tense, and  $\phi$ -features realized on idioms? In the past tense, we have the form *kicked the bucket*, not *\*kick the bucketed*, and in the 3<sup>rd</sup> person present, we have *John kicks the bucket*. Thus in the phonological component, there must be some procedure for recognizing that *kick* is to be inflected like a verb, even though the claim here is more or less that *kick the bucket* is inserted into a  $V^0$  node *en bloc*.

Similarly, although morphological case exists in English only for pronouns, in languages where abstract Case is realized phonologically, there must be some procedure for realizing this on idioms. It may be that for “frozen” idioms, morphological case is simply frozen as part of the idiom. For example, in the German idiom *den Löffel abgeben*,<sup>297</sup> which like *kick the bucket* means ‘die’, *Löffel* ‘spoon’ is always marked for accusative case, and can never appear in the passive (where it would otherwise get nominative case):

(278) a. Er hat den Löffel abgegeben.

he has the-ACC spoon given

‘He has died’

b. \*Der Löffel wurde abgegeben.

the-NOM spoon was given

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<sup>297</sup> Literally ‘to give [or ‘hand in’] the spoon’. I thank Sandra McGury for the judgements in (278).

I assume that for such idioms, morphological case is simply a part of the idiom's phonological form,<sup>298</sup> and is not a reflex of abstract Case. As with *the bucket* in English, I would suggest that *den Löffel* is not present during narrow syntax, and is added only postsyntactically.

Finally, as for the top-down structure building I propose in Chapter 5, there are innumerable modules of the grammar that need to be incorporated, several of which I mentioned there. I assume that Agree works along the general lines suggested by Chesi (2015) and den Dikken (2018), but other features of how derivations work have yet to be addressed. For example, we need a theory of how linearization works top-down (see fn. 287 above), as well as a conception of how phrases are related to their heads (i.e., with respect to notions such as labelling, endocentricity, etc.); see fn. 243. And as I note at the end of Chapter 5, any phase-theoretic system, including a top-down system, should be able to provide a coherent account of syntactic locality: ideally island phenomena should be reducible to general computational constraints, the goal being for the theory to “deliver the ‘syntactic archipelago’ on a silver plate” (den Dikken, 2018:103).

Overall, I view the research program sketched out in Chapter 5 as something akin to Chomsky's Minimalist Program (MP): not a theory *per se*, but rather a new methodological perspective. In the MP, Chomsky posits the Strong Minimalist Thesis: What if language is an optimal solution to interface conditions? What if we start with something simple like Merge, formulate it in such a way that it's maximally applicable to a range of phenomena, and then proceed to re-assess everything we've already described

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<sup>298</sup> Presumably idioms begin as metaphors, before becoming conventionalized; I would expect this would be when morphological case is frozen as part of the idiom. Note also that this would not be the case for all idioms; for the German equivalent of *spill the beans*, I would expect that the DP corresponding to *the beans* could appear with any case inflection.

from this minimalist perspective? The research program that I begin to sketch out in Chapter 5, I think, is situated similarly to the mainstream of linguistic theory,<sup>299</sup> in that it explores whether all the machinery associated with decades of research by the most brilliant minds on the planet can be reconstrued in terms of a cogent, theory-external perspective. For the MP, this theory-external perspective is what is now known as biolinguistics. For the research program initiated here, the theory-external perspective is psycholinguistics and cognitive psychology generally, along with the simple intuition that speakers construct sentences beginning with the first word, and proceeding to add more and more words until they have a sentence.<sup>300</sup>

### *6.3 Experimental confirmation; parting thoughts*

Establishing that LIT-D is theoretically plausible will be no small task, but I see it as insufficient; I also intend to build the strength of my case theory-externally, and part of my research program going forwards will involve testing the predictions of this model experimentally. As a first step, I have designed a cross-modal lexical priming study whose goal will be to probe the theoretical hypothesis that idioms with unaccusative M<sub>1</sub>s

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<sup>299</sup> The main difference being that I am not Noam Chomsky.

<sup>300</sup> Credit of course to Phillips, Lewis, Richards, Zwart, Bianchi, Chesi, den Dikken, and others who at some point must have had the same flash of insight as did I on the evening of July 29, 2017, while listening to cicadas and to R.E.M.'s "You Are the Everything" on my Athens, GA porch: viz., a top-down system is conceivable if we're willing and able to look at everything we think we know with a fresh perspective.



are represented mentally by unaccusative structures, and in particular, that the grammatical subjects of these sentences check their theta features internal to the VP.<sup>301</sup>

The experimental paradigm will be that of crossmodal lexical priming, in which subjects listen to recorded sentence primes and decide whether visually presented probes are words or nonwords. Similar work on empty category processing has been done by Bever and McElree (1988), Bever and Sanz (1997), Featherston (2001), and Friedmann, Taranto, Shapiro, and Swinney (2008), and is similar to the paradigm used in an ongoing study on empty category processing in Brazilian Portuguese here at UGA (Gupton, Merchant, & Olsen, in progress). The advantage of crossmodal over unimodal priming is that online activation can be detected if probes appear *during* the processing of a sentence, instead of *afterwards*; thus, variation in activation over the course of a sentence can be observed.

In these sorts of paradigms, the null copies of arguments which are pronounced in the functional/discourse layer serve to reactivate the arguments; as such, subjects tend to recognize either repeated words (as in the Bever studies) or semantic associates (as in Friedman et al.) more quickly when the probe word appears after the structural position of the null copy. This is known as repetition priming (in the first case) or simply semantic priming (in the second). If the subject arguments of unaccusative idioms such as *buy the farm* really bear an internal theta role, then we should see reactivation of the subject compared to a sentence that includes a transitive predicate such as *buy the house*, where no postverbal null copy is predicted to exist.

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<sup>301</sup> See section §5.4.4 for “theta-feature” checking; this is equivalent to saying, in a bottom-up model, that these arguments are inserted in a position where they are assigned an internal theta role, before subsequently moving to subject position.

Friedman et al. (ibid.) found a greater facilitation for semantic associates of the heads of subject DP chains in unaccusative sentences than in unergatives. This proposed experiment will build on that work, testing whether prime sentences with idioms like *kick the bucket* (as in (280) below) show a similar facilitatory effect as sentences with literal unaccusative verbs, as in (279):

(279) [The **plumber** \* with the big back yard]<sub>i</sub> suddenly died  $t_i$  \* last Tuesday\*

*Probe:* PIPES

(280) [The **mechanic** \* I like]<sub>i</sub> suddenly kicked the bucket \*  $t_i$  last week\*

*Probe:* AUTO

The asterisks here indicate probe points, which will vary by trial; the third probe point will be 750 ms after the second, in keeping with Friedman et al.'s methodology.<sup>302</sup> The expectation is that in both cases, a probe word appearing after the structural position in which the null copy ( $t_i$ ) appears (i.e., at the second or third probe point) will be recognized faster than an unrelated word. However, we would expect no such effect for unergatives, as in (281) and (282), as no postverbal null copy exists to reactivate the argument.<sup>303</sup>

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<sup>302</sup> Based on findings of Osterhout & Swinney (1993) with respect to downstream activation in passives.

<sup>303</sup> Note that the theory predicts there to be a null copy in the external theta position (spec-vP), but it would be preverbal. Friedman et al. found no reactivation due to this copy.

(281) [The **professor** \* who loves poetry]<sub>i</sub> pulled some strings \* for his niece\*

*Probe:* CLASS

(282) [The **guitarist** \* with the weird hair]<sub>i</sub> kicked \* the beehive out back\*

*Probe:* MUSIC

Facilitation at probe points 2 and 3 will be judged with respect to facilitation at point 1, which should show maximum activation compared to an unrelated word. In unergatives, this activation is expected to decay over the course of a sentence, but in unaccusatives, the null copy in the gap is expected to reactivate the argument.

Note that in (279) and (282), *kicked the beehive* and *kicked the bucket* are, according to theories in which idiom components are inserted presyntactically, predicted to have the same structure. Under the model I propose, however, *kick the bucket* is unaccusative, but *kick the beehive* is unergative. Thus the derivations for the unaccusatives in (279) and (280) should be identical, but (279) and (282) should be distinct, despite the superficial similarity. The unergatives in (281) and (282), on the other hand, should have identical structures.

If the expected results are borne out, we can conclude that at least in language comprehension, the parser makes use of null copies in the course of structure building in order to interpret a proposition with respect to a verb, and that the grammatical subjects of unaccusatives are in fact interpreted as internal arguments, i.e., Proto-Patients (Dowty, 1991). Furthermore, if similar facilitation is seen at the 2<sup>nd</sup> and 3<sup>rd</sup> probe points in sentences like (279) and (280), but no facilitation is seen in sentences like (282) at those points, we can conclude that idioms like *kick the bucket* are interpreted by the parser as

unaccusative. This will constitute good indirect evidence for postsyntactic insertion, in which, e.g., unaccusative structures are built from abstract roots, which can be matched at Phonological Insertion by either figurative or literal exponents.

I will close by noting that attempting to construct a psycholinguistically grounded theoretical model may seem a bit quixotic, and I'm cognizant of Carl Sagan's maxim that "extraordinary claims require extraordinary evidence." Indeed, Tom Bever has cautioned me that "the history of attempts to unify performance and the grammar is littered with elegant failures" (p.c., 2018). So I'm aware of the headwinds. But I do think it's a necessary quest, and I maintain the urgency of my central thesis: linguistic theory must construct models that are legible at the interfaces with other disciplines, and which make not only theory-internal predictions, but theory-external predictions as well.

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