

Nominal Roots as Event Predicates in
English Denominal Conversion Verbs

by

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ABSTRACT

Despite the high productivity in English of denominal verb formation by conversion, a constraint on possible interpretations is identified: intransitive denominal conversion verbs are infelicitous where the source nominal is intended to be an incremental theme (*#apple* ‘eat apple’), a patient (*#shirt* ‘wear shirt’), or the holder of a result state (*#window* ‘open window’). This little-studied constraint is compared to a well-known constraint on denominal conversion verbs in which the source nominal is intended as an agent or cause (*#it cowed a calf* ‘the cow had a calf’, (Hale and Keyser, 1993)), accounted for in previous literature by a prohibition on incorporation in sublexical syntax from specifier position. To account for both constraints it is proposed that nominal roots in English denominal conversion verbs do not originate in argument position, but adjoin directly to subeventual heads, and are interpreted as predicates of events. A prediction is made that English denominal conversion verbs should exhibit the same argument and event structure possibilities as verbs built from verbal roots, which is confirmed by a corpus study of 250 verbs from each class. Nominal roots, however, have a significantly higher likelihood of being lexicalized as transitive verbs than verbal roots do. A study is further undertaken of the semantics of English denominal conversion verbs, resulting in a reformulation of Kiparsky’s (1997) Canonical Use Constraint; specifically, it is proposed that a canonical event type associated with a nominal root can be a default interpretation

for a denominal conversion verb if and only if the argument structure template of the canonical event type can be unified with the arguments of the denominal verb. The role of pragmatics in the interpretation of English denominal conversion verbs is considered, and it is suggested that apparent exceptions to the constraint on themes, patients, and result states can be attributed to re-interpretation of the verb as an agent-oriented manner verb.

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INTRODUCTION

The phenomenon of noun-to-verb conversion is very common in English. The notion of “conversion” assumes that words belong to grammatical categories such as noun, verb, and adjective, and refers to the use of a word belonging to one category in the natural environment of another – in this case, nouns that appear to be used as verbs. Denominal conversion verbs range from well-established formations like those in (1) to innovative, yet readily understandable, formations like those in (2).

- (1)
- a. I have a Jersey milk cow that calved yesterday about noon.
 - b. If I mopped the floor with a solution of water and bleach, do I need to rinse the floor with just water?
 - c. Blanketing the soil surface with mulch will help conserve and protect water, save time and money, and improve overall appearance of your landscape.
 - d. It all began on the Yves Saint Laurent catwalk in October when designer Stefano Pilati accessorised his spring/summer '09 collection with a crafty, new shoe-boot that ‘caged’ the models’ feet behind an intricate trellis of woven leather and metal.
- (all from WWW)
- (2)
- a. Could you please PDF this document and re-send it?

- b. Thrill-seekers are “tombstoning” from a bridge, putting themselves and river users in danger.
 - c. In general, I have not experienced any difficulties with academics in terms of getting interviews + jobs (still post-docing though).
 - d. One vote for Richmond, VA, & another for DC (because I can totally metro home drunk).
- (all from WWW)

The goal of this dissertation is to address some questions regarding how English denominal conversion verbs, both established and innovative, are built from the morphosyntactic building blocks of English, in comparison to verbs that are not denominal, and to investigate the interpretations that can be assigned to English denominal conversion verbs.

1.1 Background

Historically, conversion has been conceived as a category-changing operation, or as a derivational morphological process involving a null affix. Many modern linguistic theories, however, take a more nuanced view of the conversion phenomenon. There is good evidence that there are semantic and morphosyntactic building blocks below the word level, and it is believed that these are implicated in the examples seen in (1) and (2).

The key question is how they are implicated, and there are currently two major strands of theory – incorporation and underspecification – which take different views. According to incorporation theories (Hale and Keyser, 1993, 1997a, 1998, 2000, 2002; Harley, 1999, 2005; Mateu, 2001; Mateu and Rigau, 2002; Mateu, 2002, 2008, 2009; Haugen, 2009), in at least some cases the nominal element originates in an argument position and undergoes a syntactic operation allowing it to “fill in” for a null verb. The original argument position as well as the subsequent movement influence the ultimate interpretation of the denominal verb. According to underspecification theories (Halle

and Marantz, 1993, 1994; Farrell, 2001; Arad, 2003, 2005; Borer, 2005a,b), on the other hand, the existence of a homophonous, semantically related noun-verb pair points to their both being formed from the same uncategorized “root”, a basic core element of semantics, syntax, and phonology. I will make a proposal for English denominal verbs within the general underspecification approach, arguing that the nominal root involved in conversion verbs is interpreted as an event predicate and not as an argument.

1.2 Key Data and Proposal

Throughout this dissertation I focus on two key pieces of data. The first is an observation about the interpretation of intransitive denominal conversion verbs in English: they are infelicitous when the nominal is intended to be interpreted as an incremental theme (3a), a patient (3b), or a holder of a result state (3c) – in general, an object – even when the intended meaning is a canonical event type for the nominal.

- (3) a. # Mary was appling at lunch today.
intended: ‘eating apples’
- b. # Beth was hatting when I saw her.
intended: ‘wearing a hat’
- c. # It was stuffy in the room, so Susan went around windowing.
intended: ‘opening windows’

The infelicity is especially surprising in the theme cases, where the canonical event reading is readily available in complement coercion, cf. *Mary finished/enjoyed the apple*. The absence of theme, patient, and resultee interpretations in intransitive denominal conversion verbs in English has received little discussion in previous literature and has not previously been studied from a formal perspective. I will compare it with a well-known constraint against interpretation of the nominal in denominal conversion verbs as an agent or cause (4), which has been analyzed in previous literature as a prohibition on

Class	Examples
Transitive activity	bait, dredge, parade
Intransitive activity	crayon, farm, motor
Accomplishment	barbecue, plough, smoke
Achievement	carpet, corral, pawn

Table 1.1: Denominal conversion verbs across Vendler aspectual classes, with example verbs from the British National Corpus.

incorporation from a specifier position.

(4) # It cowed a calf.

intended: ‘the cow had a calf’ (Hale and Keyser, 1993)

The second key piece of data is the observation that English denominal conversion verbs occur in the same argument and event structure constructions as verbs which are formed from verbal (rather than nominal) roots. For example, denominal conversion verbs occur in all Vendler aspectual classes (Table 1.1). This is not predicted by all previous theories, and in fact little attention has been paid to the argument and event structure possibilities of denominal conversion verbs from an output-oriented perspective. This dissertation verifies the full range of possibilities with a corpus study, while also finding that denominal verbs are significantly more likely to be used in transitive constructions than verbs formed from verbal roots are. Thus both pieces of data on which I focus are related in some way to intransitive conversion verbs in particular: their frequency, and their interpretation with respect to the nominal element they contain.

Throughout, I make the assumption that, if possible, it is preferable to have a unified analysis of denominal conversion verbs rather than attributing different subclasses (e.g. location versus instrumental verbs) to different syntactic mechanisms.

I make the proposal that denominal conversion verbs are never in argument position at any stage of sublexical syntax, but rather are the result of a nominal root adjoined

to a verbal subeventual head in a process of lexical subordination, and are interpreted as event predicates. I argue that this approach accounts for the constraints on theme, patient, resultee, agent, and cause interpretations, as well as a range of semantic facts about denominal verbs. One result is a re-examination of the well-known Canonical Use Constraint (Kiparsky, 1997), which says that the meanings of denominal verbs always involve canonical event types associated with the nominal; I argue that this is true only to the extent that the argument structure template of the canonical event type is consistent with the observed argument structure of the denominal verb.

1.3 Structure of the Dissertation

This dissertation is structured in four major chapters. Chapter 2 presents a review of the literature on denominal conversion verbs, focusing mostly on recent incorporation and underspecification approaches. Chapter 3, Argument Structure Possibilities for Denominal Verbs, and Chapter 5, Denominal Verbs and Event Predication, are intended to be easily turned into standalone papers which will be submitted as journal articles. For this reason some introductory and background material along with the main proposal is repeated in these two chapters, although the literature review is consolidated in Chapter 2. Chapter 3 relies heavily for its conclusions on evidence from Chapter 4, Corpus Study, and it is intended that a condensed version of Chapter 4 be included in the journal submission. However, the corpus study has been presented as a separate chapter of the dissertation, in order to allow for a more detailed description of the methods used.

1.4 Terminological Notes

Throughout, I use the term “conversion” as a non-technical, atheoretical label for the phenomenon under discussion. The only potential conflict with this convention is in Section 2.3, which discusses the actual morphological theory known as conversion, in

contrast to zero-derivation. I believe it will be clear what I mean in this section, but when it is necessary to clarify, I use the term “true conversion” or “functional shift” for the theory.

For convenience, I use the terms “conversion verb” and “denominal verb” interchangeably throughout to refer to denominal conversion verbs. Since the dissertation focuses on these verbs, and not on overtly derived denominal verbs (e.g. *demon-ize*, *sign-ify*) nor on conversion verbs formed from other categories (e.g. deadjectival verbs), I trust this will cause no confusion.

I sometimes refer to the nominal root involved in conversion as the “source nominal”, since it is the source of the conversion verb; this is similar to the “parent noun” of Clark and Clark (1979).

LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of previous approaches to conversion in English, particularly noun-to-verb conversion. The literature in this area is vast and I do not attempt to cover it all; instead I try to give the flavor of some major approaches, focusing on two of the most recent and influential, incorporation (Section 2.5) and underspecification (Section 2.6).

A potentially relevant area of literature which I nevertheless do not attempt to treat here is that which seeks to define the nature of grammatical categories, in either semantic or syntactic terms (e.g. Baker, 2003). I also do not specifically address pragmatic accounts of denominal conversion verbs, but take it as given that pragmatics plays a significant role in the interpretation of denominal verbs, especially of novel coinages. As described in the Innovative Denominal Verb Convention of Clark and Clark (1979), a wide variety of meanings can emerge for any noun used as a verb, as long as the meaning is in the common ground of speaker and hearer and the speaker obeys Gricean conversational maxims with the coinage. Aronoff (1980) similarly takes up the notion of conversion verbs as “contextuals”, i.e. semantically impoverished verbs whose meaning is always negotiated in context. I note, however, that pragmatic factors alone are not

enough to explain the systematic constraints on denominal verb meanings which I investigate in this dissertation, since the missing interpretations are ones which could be expected to be in common ground.

2.2 Historical Observations

Conversion has long been recognized as a productive word-formation process in English (e.g. Sweet, 1898; Bladin, 1911; Koziol, 1937; Biese, 1941; Bloomfield, 1933; Jespersen, 1942; Marchand, 1969, and many others). The term “conversion” itself is thought to be due to Sweet (1898). It has sometimes encompassed a wide variety of phenomena involving uses of words outside their primary category, including so-called “partial conversion” cases like the adjective *poor* in the NP *the poor*, or the modifying noun in N-N compounds like *stone wall* (Sweet, 1898, I, p.39; Kennedy, 1935, p.318; Zandvoort, 1972, p.266). Conversion has also been held by some to include shifts within a grammatical category, e.g. from proper to common noun (Kennedy, 1935, p.317), which Bauer (1983) calls nonmajor shift (within a grammatical category) as opposed to major shift (different grammatical category). Over time conversion has come to exclude the partial and nonmajor conversion cases, which are attributed to other mechanisms, such as coercion.

Conversion first came into wide use around the beginning of the 13th century (Biese, 1941). Historically, conversion is thought to have been encouraged by several facts about English. First, Old English had a large number of nouns and verbs with shared roots, e.g. *caru* (n.) / *carian* (v.) ‘care’. When inflections were leveled in Middle English, the forms fell together (Jespersen, 1942; Cannon, 1985). Jespersen (1956) notes that this phenomenon not only created a ready-made inventory of homophonous nouns and verbs, but may have encouraged the formation of new denominal conversion verbs by analogy. Second, the frequency of conversion may have been encouraged by borrowings, as some French items were borrowed as both nouns and verbs prior to 1300, e.g. *comfort*,

doubt, dance, poison. French loanwords began to participate in conversion after 1300, again perhaps influenced by analogy (Marchand, 1969, p.365; Jespersen, 1942, p.91; Biese, 1941, p.299ff). Finally, the relative poverty of derivational resources for creating denominal verbs in English, presumably a historical accident, may have played a role. With *-ate, -ize, -ify* all somewhat restricted in meaning and register, there have been few morphological processes competitive with conversion (Marchand, 1969, p.364).

One reason for focusing on denominal verbs as a subcategory of conversion is that it is one of the most productive categories of conversion (Stevick, 1968, p.251; Marchand, 1969, p.361-373; Cannon, 1985). Prasada and Pinker (1993) have estimated that approximately 20% of all verbs in English are formed by conversion. In an extensive study of some 9,000 denominal verbs in the Oxford English Dictionary, encompassing both conversion and overt derivation, Gottfurcht (2008, p.103) finds that conversion accounts for about 66%.

2.3 Conversion and Zero-Derivation

One early concern for research into the phenomenon of conversion was deciding whether it was true conversion, also known as “functional shift”, which involves a temporary or permanent recharacterization of a word’s grammatical category without any regular derivational process involved; or whether it was “zero-derivation”, a regular derivational process which happens to involve one or more phonologically null affixes. The key question here is to what extent conversion shows parallels with overt morphology. I give a brief overview of the issue here; for a fuller review see Bauer (1983, p.226-30), Štekauer (1996), Plag (1999, p.219-25), and many others.

Proponents of zero-derivation include Bloomfield (1933); Jespersen (1942); Marchand (1969); Adams (1973), and Kiparsky (1982). Bloomfield (1933) likened the supposed zero element to other zero elements in morphosyntax, such as zero plurals (*sheep*), past

tenses (*bet*, *cut*), and formation of compound agent nouns (*bootblack* with zero *-er*). Interestingly, the overt analogue criterion (Marchand, 1969; Sanders, 1988), i.e. the notion that zero elements can be posited only when there is a non-zero element with the same function (in the same or another language), has been used both in favor of zero-derivation and against it. Marchand (1969) invoked the overt analogue criterion in favor of zero-derivation, pointing out the semantic parallels between overtly marked and converted verbs, e.g. *atomize* and *cash* both following the template ‘convert into N’, or *alcoholize*, *camphorate*, *paraffin*, and *sugar* all following the template ‘prepare, treat with N’ (p.359-360).

Proponents of conversion, on the other hand, include Koziol (1937); Strang (1968); Zandvoort (1972); Bauer (1983); Lieber (1980, 2004) and Plag (1999, 2003). Against the idea of zero-derivation it is argued that the semantic range of conversion verbs is much wider than that found with overt affixation (Plag, 1999, 2003; Lieber, 2004). Plag (2003, p.112-3) cites examples such as *eel* ‘fish for eel’ or ‘move like an eel’, and *crew* ‘act as a (member of a) crew’ or ‘assign to a crew’. The wide semantic range suggests that conversion fails to meet the overt analogue criterion, since there is no overt affix with equal flexibility. Lieber (2004) argues that the overt denominal affixes in English can be represented by a single Lexical Conceptual Structure (LCS) (Jackendoff, 1983), with the addition of some sense extensions, but that no single LCS will suffice to cover all the possible meanings of denominal conversion verbs. In addition, again from the point of view of the overt analogue criterion, it is not clear that a single zero-suffix would suffice; Plag (1999, p.224-5) argues that in addition to a zero-suffix with a “general verbal” meaning, it would be necessary to have a zero-prefix with a meaning similar to *en-* and *be-*, and a distinct privative zero-prefix analogous to *un-*, *de-*, and *dis-*, since privative meanings also emerge in conversion verbs. The proliferation of potential zero-affixes is taken to be evidence against zero-derivation (though in fact I believe that a “general” verbal affix could cover these cases, since there is no requirement in the overt analogue

criterion for a zero analogue of all the overt affixes).

These days the question of conversion vs. zero-derivation has largely fallen by the wayside. Theories of both conversion and zero-derivation assume that a word is stored in a lexicon as a monolithic unit with accompanying category information. More recent theories that account for denominal verbs (e.g. Distributed Morphology (Halle and Marantz, 1993, 1994) and lexical syntax (Hale and Keyser, 1993, 1997a, 1998, 2000, 2002)) have shown evidence for sublexical units of meaning and sublexical syntactic operations, providing more complex options for the relationship between a noun and a verb that share a morphological root, and making it possible to explain the conversion phenomenon in morphosyntactic terms without the need to posit a set of zero affixes. In addition, the idea has been advanced that morphological roots are uncategorized until they combine with functional material in syntax (Halle and Marantz, 1993, 1994; Borer, 2005a,b), an approach that makes the notion of functional shift obsolete, since apparent conversion would be an epiphenomenon of using the same root with different functional material. However, even now some reflections of the historical debate can be seen. Lieber’s 2004 theory of “re-listing”, for example, which amounts to adding a lexical entry each time conversion takes place, is fundamentally a conversion theory (and has its own problems, specifically a proliferation of lexical entries for every polysemous root, something that underspecification theories seek to avoid). Moreover, the wide semantic range of conversion verbs, used as evidence against zero-derivation, is still an important factor in understanding conversion, and one I will return to in Sections 2.4 and 3.9.

2.4 Semantic Decomposition and Semantic Classes

From the earliest descriptive accounts of conversion, it quickly became clear that there are some semantic regularities which can define subclasses of denominal verbs. These regularities have been captured with labels such as *locatum* and *instrumental* (Jespersen,

1942; Marchand, 1969; Adams, 1973; Clark and Clark, 1979; Štekauer, 1996, a.o.). The labels refer to the relation between the source nominal and the event described by the resulting verb. Generally these are semantic relations, although some work has referred to grammatical functions such as argument and adjunct in the class definitions (e.g. Marchand, 1969).

It is a hallmark of semantic class approaches that the class definitions are accompanied by paraphrases of verb meaning, typically informal templates such as ‘provide or furnish with X’; but sometimes making use of more formal structures including a variety of semantic primitives, such as causation. These are claims about semantics only; no claim is made that the noun originates in a corresponding position in syntax. Unsurprisingly, the nouns themselves often exhibit natural classes corresponding to the verb classes: instrument verbs are often built on instrument nouns such as *hammer*; transportation verbs on vehicles such as *bicycle*; etc. Presumably nouns with similar semantics tend to form similar verbs, reinforced by the tendency of the the verb classes themselves to be extended by analogy (cf. Kelly (1998)).¹

Most work that proposes a set of verb classes with semantic templates acknowledges that the paraphrase is only an approximation and does not capture the full meaning of all the verbs in the class. Jespersen (1942), for example, while providing a set of semantic classes, also notes: “It is difficult to give a general definition of the sense-relation between substantives and de-substantival verbs. The verb may designate any action or state that bears a relation to the substantive in question” (93). Polysemy can also result in multiple class membership for a given noun; Jespersen gives as an example *stone a man* ‘kill by throwing stones’ and *stone cherries* ‘remove the stones from’.

There are many commonalities among the semantic class schemes, although each one has its own idiosyncrasies. To give a flavor of the approaches, selected semantic classes from some of the schemes are shown in Tables 2.1-2.6. Plag (1999) provides a summary

¹This idea is perhaps reminiscent of the notion that verbs with similar semantics tend to cluster in syntactic classes (Levin, 1993).

of classes from across various schemes, which is in Table 2.7; I give the equivalent class labels from Clark and Clark (1979) there as well, since these are commonly used in the syntactic literature, and I use them throughout the rest of the dissertation.

The semantic classes are useful descriptive tools and clearly capture some generalizations, as well as making it possible to measure the relative size and productivity of various subclasses of denominal verbs. Another potential advantage is that, to the extent that the semantic decomposition in the proposed meaning templates aligns with (sublexical) syntax, the classes provide a guideline for syntactic analysis; e.g. location and locatum verbs in the theory of Hale and Keyser (1993) have a syntax which aligns closely with some of the proposed semantic templates, though this was not necessarily the intention of the original classifications.

A notable disadvantage, however, is that classifying *attested* denominal conversion verbs does not help with identifying gaps where denominal conversion is constrained in English. This is the case for the infelicitous intransitive patient/theme/resultee/agent/cause examples, which are, naturally, absent in the various denominal verb classification schemes.

A second disadvantage is the input-orientation of these approaches. They focus on the relation between the noun and the event, but not the form of the surface verb. An alternative would be to use traditional verb classes such as argument structure classes or Vendler aspectual classes (Vendler, 1957) to categorize the verbs. It turns out that denominal verbs occur in all the Vendler classes, as shown in Table 2.8, a fact which has not been noted in previous literature except in passing by Lieber (2004). Most of the semantic classification schemes for denominal verbs devote little attention to argument structure, grouping transitives and intransitives together, for example.

A third major disadvantage is the size of the “miscellaneous” class. In the examples collected by Clark and Clark (1979), there were more verbs in the miscellaneous class than in three of the named classes; see Table 2.9.² Plag describes a “growing consensus

²It should be noted that theirs was an ad hoc collection, so no statistical significance can be attached to the size of the miscellaneous category.

Class	Examples
‘put in a place’, with nouns indicating a place	bed, book, bottle, can, church, cloister, cupboard, corner, floor, focus, island, jug, nursery, pillory, pocket, quod, sidetrack, sky, slate, tree, window
‘provide or furnish with sth, put on a garment, etc’	arm, diet, dress, flesh, gas, handcuff, harness, horse, initial, pension, pomatum, ring, shawl, summons, subpoena, wire
‘action for which implement is meant’, from names of implements	cable, nail, screw, wire, axe, bomb, cane, ruler, chain, chalk, cork, dynamite, hammer, hook, key, knife, lever, ransom, sandbag, sandpaper, taxi, torpedo, toy, tree, wire, x-ray, Zeppelin
names of drinks: implements in a widened sense	liquor, tea, wine
parts of the body, used as a kind of implement	arm, beard, body, breast, cheek, chin, ear, elbow, eye, face, finger, fist, foot, front, hand, head, jaw, knee, limb, lip, nose, paw, shin, shoulder, stomach, thumb, toe, tongue, sense, wing
‘spend the time indicated by the substantive’ for periods of time, weather	honey-moon, winter, week-end, mist, frost
‘action or state that resembles the thing in shape’	cave, elbow, honeycomb, mushroom, sandwich, tail, queue, spread-eagle, telescope, silver, freckle
resemblance to that which is done with or by the thing	cloud, Copenhagen ‘sink without warning’
names of persons occupied a certain way	cook, nurse, agent, beggar, butcher, captain, clerk, doctor, general, nursemaid, laundress, recruit, shepherd, soldier, star, tailor, tutor, valet, vet
verbs from words denoting a mass of persons	people, mob
verbs formed from derived action-nouns; new verb generally has a special application, or no native verb in English, or noun and verb have become isolated from each other in meaning	allowance, dinner, drift, sight, action, caution, commission, condition, function, mention, motion, partition, pension, petition, proportion, requisition, sanction, station, suspicion, capture, feature, pleasure

Table 2.1: Selected semantic classes from Jespersen (1942, p.93-100). Note some examples are obsolete as verbs.

Relation	Meaning	Subgroup	Examples
Predicate–Subject Complement	‘be, act as, play the –’	personal	bully, buther, captain, chaperon, father, mate, model, mother, nurse, pilot, pimp, pioneer, pirate, referee, rival, tutor, umpire, usher, witness
		animal	ape, buck, crane, dog, fox, monkey, parrot, snake, wolf
		inanimate	bolt, bulge, dart, flock, hulk, jack-knife, needle, queue, shadow, skyrocket, snowball, steam, swarm, tail
Predicate–Object Complement	‘make into, put in the form of, give the form of, con- vert into –’	inanimate	arch, bale, bundle, cash, fraction, group, heap, lump, malt, phrase, pool, ration, scrap, zone
		personal	beggar, cripple, cuckold, dwarf, fool, knight, martyr, outlaw
	‘treat as’	personal	baby, badger, cosset, gull, pet
Predicate– Adverbial Comple- ment	ornative: ‘provide with’	concrete or ab- stract	anger, awe, barb, belt, cloak, com- mission, document, earmark, finger, flavor, flounce, frill, handcuff, heat, label, mask, muzzle, picket, scent, shame, tag
			‘coat with’
	instrumental	instruments and tools	brake, brush, comb, file, filter, ham- mer, mop, plane, shovel, bugle, fiddle, guitar, trumpet
			body parts
	‘fasten with’		anchor, belt, bolt, button, buckle, chain, clamp, hook, lash, nail, pad- lock, rivet, rope, screw
transportation		barge, broadcast, cable, cart, lighter, mail, parachute, ship, sled, sledge, taxi, truck, van, wheel, wire, bike, ca- noe, ski, skate	

Table 2.2: Selected semantic classes from Marchand (1969, p.368-371).

Class	Meaning	Trans	Examples
Noun is object	‘to hunt, catch, pick, collect’	intr	fish, blackberry, fowl, whale
		intr	bloom, bud, flower, seed, foal, lamb, litter, whelp, echo, foam, lather, smoke, steam, thunder, coin, knot, pattern, tunnel, gesture, grimace, joke, scheme, wisecrack
	‘to produce, make, give birth to, the entity denoted by the noun’	trans	experience, pity
	‘to feel, experience, suffer, what the noun denotes’	intr	hunger, lust, panic, thirst
Noun is complement	‘to take on the role denoted by the noun’	trans	captain, chaperon, father, pilot, rival, tailor, tutor, umpire, witness
		trans	boss, butcher, doctor, dwarf, lord (it), master, mother, queen (it), shepherd, usher, ape, dog, ferret (out), hog, parrot, pig (it), squirrel, wolf, worm (one’s way), bridge, cushion, flood, ghost, head, shadow, shield, snow, spirit (something away)
	‘to behave in the manner of, to act as, to resemble, the person, animal or object denoted by the noun’	intr	bum (around), clown, fool (around), slave, soldier (on), star, chicken (out of), clam (up), horse (around), monkey (with), snake, balloon, cannonball (into someone), cave (in), fork, jack-knife, mushroom, ooze, rocket, snowball, spiral, sponge (on someone), tail (off), tower (up)
Instrumental	‘to perform an action by means of what the noun denotes’	trans	axe, brake, cart, hammer, ink, mirror, mail, sandpaper, screw, soft-soap, x-ray, blue-pencil, bomb, catapult, gas, guillotine, knife, plague, shell, stone, blanket, fence, handcuff, padlock, ring, rope, strap, elbow, eye, face, finger, paw, voice, ransom, signal, subpoena, veto
		intr	bicycle, catapult, labour, ski, steam, toboggan

Table 2.3: Selected semantic classes from Adams (1973).

Meaning	Examples
CAUSE vb GO TO object	water the lawn, air the room
CAUSE vb COME FROM object	peel an orange, bone a chicken
CAUSE object BE+LOC vb	crate books, pocket a pen
BE (LIKE) vb TO object	father a child, mother a child

Table 2.4: Selected semantic classes from Rose (1973).

in the linguistic literature that the variety of meanings that can be expressed by zero-affixation is so large that there should be no specific meaning attached to the process of zero-derivation at all”.

Cannon (1985) notes “the difficulty in attempting to force more than a third of the 202 new verbs [in a dictionary study] into Quirk’s et al.’s seven semantic groups”, giving as examples *blindsided*, *revved*, and *redshirted*. Davies (2004) cites examples like *Cameroon* (5), which is very difficult to fit into any semantic template, but acceptable in context.

- (5) Robbie Fowler, Jamie Redknapp, Erik Meijer and Veggard Heggem are crocked however and Rigobert Song is Camerooning in the African Nations Cup.
(Davies (2004), originally from Guardian online, in a discussion of a football team unable to field enough players)

Gottfurcht (2008), in an examination of some 12,000 potential conversion verbs resulting from a search of the Oxford English Dictionary, also notes the need for an “other” category, in which she included the conversion verbs *rubber* ‘to listen or listen in (on a party telephone line)’, *snooker* ‘to place in an impossible position; to balk, “stymie”’, and *total* ‘to damage beyond repair (esp. a motor vehicle, in an accident)’ (p.101). In other words, the classifications of English denominal verbs into semantic classes represented by meaning templates tend to “leak”, which means that the classes are neither comprehensive nor explanatory; and an approach that accounts for the verbs in the miscellaneous category in a principled way – without denying the existence of subregularities in denominal verb

Class	Meaning	N Class	Examples
Locatum	'cause it to come about that something has N on/in it'	Coverings:	blanket the bed, bedspread the bed, slipcover
		Tempo- rary	the cushion, carpet the floor, newspaper the shelves
		Permanent Solid	roof the house, cobblestone the road, tarmac the road, gravel the driveway, pad the cell, panel the room
		Fuels	gas the car, Quaker State the car [ad], fuel the 747, coal the ship, fire the kiln
		Viscous	marmalade the toast, butter the bread
Location	'cause it to come about that something is in/on N'	Storage	ground the planes, beach the boats, land the boat, bench the players, doormat the boots, shelve the books, spool the thread, rack the plates
		Places	
		Strings	string the beads, spit the chicken, skewer the meat, tender the balloon, leash the dog
		Habitat	headquarter the troops, bivouac the soldiers, lodge the guests, bed the stones in mortar
		Containers	pot the begonias, can the fruit, tin the peaches, jug the hare, creel the trout, sack the potatoes
Agent	'do the act that one would normally expect N to do'	Occupations	butcher the cow, jockey the horse, referee the game, umpire the match, nurse the patient, doctor the victim, nursemaid the baby, tutor the boys, valet the squire, soldier, maid, butler, clown
		Special Roles	monitor an exam, referee the game, champion the cause, partner the host, usher the people to their seats, flunk for someone, soprano, fool around
Goal	'cause it to come about that something is N'	Human Roles	fool the man, orphan the children, baby the student, knight Gawain, sucker the public
		Groups	group the actors, pod the seals, regiment the crowd, parade the troops, line up the class, sequence the lessons, array the jewelry
Miscellaneous		Meals	lunch, luncheon, breakfast, brunch, snack, cheeseburger, supper, picnic, banquet, feast (somewhere on something), nightcap, liquor, grub, nosh
		Parts	His ball lipped the cup (failed to go in, golf), the shot rimmed off the basket (basketball), wing the bird, kneecap the businessman, rim the glass with salt, bean the catcher (baseball)

Table 2.5: Selected semantic classes from Clark and Clark (1979).

Meaning	Examples
‘To put in/on N’	bottle, carpet, corner, catalogue, floor, garage, position, shelve
‘To give N, to provide with N’	butter, coat, commission, grease, mask, muzzle, oil, plaster
‘To deprive of N’	core, gut, peel, skin, top-and-tail
‘To ... with N’ (‘to use the referent of the noun as an instrument for whatever activity is particularly associated with it’)	brake, elbow, fiddle, hand, finger, glue, knife
‘To be/act as N with respect to...’	chaperon, father, nurse, parrot, pilot, referee
‘To make/change ... into N’	cash, cripple, group
‘To send/go by N’	mail, ship, telegraph, bicycle, boat, canoe, motor

Table 2.6: Selected semantic classes from Quirk et al. (1985).

Class	Clark and Clark (1979) Class	Meaning	Examples
locative	location	‘put (in)to X’	jail
ornative	locatum	‘provide with X’	staff
resultative	goal	‘make into X’	bundle
performative	—	‘perform X’	counterattack
similative	agent	‘act like X’	chauffeur, pelican
instrumental	instrument	‘use X’	hammer
privative	locatum	‘remove X’	bark
stative	experiencer/agent	‘be X’	hostess

Table 2.7: Semantic classes from Plag (1999), with equivalent class names from Clark and Clark (1979).

Class	Examples
Transitive activity	bait, dredge, parade
Intransitive activity	crayon, farm, motor
Accomplishment	barbecue, plough, smoke
Achievement	carpet, corral, pawn

Table 2.8: Denominal conversion verbs across Vendler classes, with examples from the annotated BNC data (see Chapter 4).

Class	Total	Examples
Instrument	412	bicycle, nail, mop the floor, trap the gopher
Locatum	335	blanket the bed, sugar the tea, pit the cherries
Location	186	ground the planes, headquarter the troops, quarry the marble
Goal	164	orphan the child, pile the money, powder the aspirin
Agent	151	butcher the cow, referee the game, parrot every word
Miscellaneous	45	lunch, blackberry in the woods, rain
Duration	13	summer in France, moonlight as a watchman
Experiencer	3	witness the accident, boycott the store
Source	3	piece the quilt together, word the sentence

Table 2.9: Number of verbs in denominal verb classes for Clark and Clark (1979). Total is the total number of examples cited by Clark and Clark (1979) in each class.

meaning – would be desirable. Moreover, there is a big potential disadvantage in basing syntactic theories on the templates – which often occurs, implicitly or explicitly – if the set of templates is not comprehensive.

A somewhat more minor issue with semantic classes is that the verbs in the classes are often quite heterogeneous, and the paraphrases used in the semantic templates are inexact. It is well-known that e.g. *cage* does not just mean ‘put in a cage’ but also evokes ‘capturing’; and *mask* does not just mean ‘put a mask on’ but evokes ‘disguising’. If this were the only objection to semantic classes, it would not be serious, but joined with the other issues it further points to the fact that the semantic classes should not be the sole basis for a formal analysis.

2.5 Incorporation Approaches

One of the most influential recent approaches to denominal verb formation is that of Hale and Keyser (1993, 1997a, 1998, 2000, 2002), which is known as the incorporation or conflation approach. (“Conflation” is a term used by Hale and Keyser for a particular subset of incorporation; I will use the more general term “incorporation”.)

Observing that denominal verbs are subject to certain constraints – that there are some meanings which never arise – they develop an account of these constraints in terms of word-formation operations that take place in lexical syntax, a subcomponent of syntax which follows normal rules of syntax but occurs within the lexicon. The incorporation approach has been revolutionary in accounting for just the types of systematic interpretation gaps which the descriptive partitioning of denominal verbs into semantic classes fails to identify, and doing so in a way that takes a step towards unifying the word-formation and syntax components of the language engine. I will argue, however, that the particular implementation presented in Hale and Keyser (1993, 1997a, 1998, 2000) and extended in subsequent literature, e.g. Harley (1999, 2005), incorrectly predicts the patient/theme/resultee readings of intransitive denominal verbs in English. In this section I give an overview of the incorporation approach and some of the major issues that have already been dealt with in the literature.

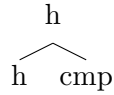
2.5.1 Overview of incorporation theory

The basic principle of Hale and Keyser’s incorporation theory is that denominal verbs are formed by incorporation of a noun into a null verbal head, possibly incorporating into a null preposition on the way; the noun thus provides the phonological material to a phonologically defective head (or set of heads, prepositional and verbal).

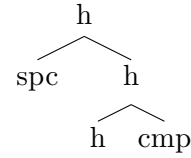
Hale and Keyser propose four basic syntactic configurations which make up lexical items, which in English correspond to the grammatical categories shown in (6). (The adjective configuration involves a special head, h^* , which requires its parent to project a specifier; we will not be concerned with that here.)

(6) Structural configurations

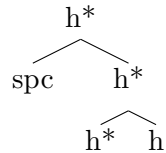
a. Verb (monadic)



b. Preposition (basic dyadic)



c. Adjective (complex dyadic)

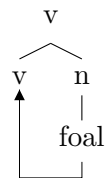


d. Noun

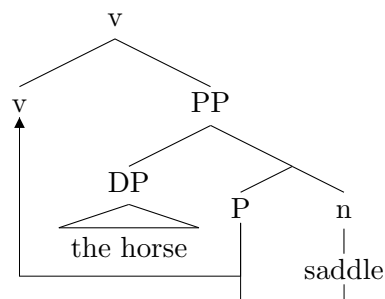


For denominal verbs, Hale and Keyser propose that the complement position of a null verbal head can be filled by either a nominal or a prepositional structure. Following incorporation, we then have (7) (for the verb *foal*) if incorporation takes place directly from a noun complement, creating an unergative verb; or (8) (for the VP *saddle the horse*) if incorporation takes place from within a PP complement, creating a location/locatum verb. The null verb in (7) receives a ‘do’ interpretation, while the null verb in (8) receives a causative interpretation. Note that the surface object in (8) originates as the specifier of the PP.

(7)



(8)



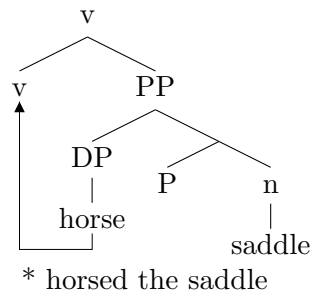
The operations involved in lexical syntax are assumed to be the same as those for post-lexical syntax, but notice that the incorporated nominal element is a bare noun or a nominal root; unlike post-lexical syntax there is no DP in the complement of P.

Note that for Hale and Keyser, the two analyses in (7) and (8) are the only syntactic structures which can be sources of denominal verbs. This means means that denominal verbs are effectively limited to unergatives and location/locatum verbs. Examples of unergatives generally fall into two categories: verbs of birthing, such as *foal* and *calve*; and activity unergatives that, by a criterion of historical precedence, would be considered verbs from verbal roots with corresponding deverbal nouns, such as *laugh*, *run*, and *dance*. Until Hale and Keyser (2002), where the activity unergatives are re-analyzed, much of the work of Hale and Keyser proposes that all unergatives are in fact denominal.

Regarding the structure in (8), note that it does not generate all change of state verbs, but specifically the ones which can be assumed to have an underlying PP. Examples are location verbs such as *corral*, *cage*, with a preposition of “terminal coincidence”, meaning ‘into/onto’; and locatum verbs such as *saddle*, *salt*, with a preposition of “central coincidence”, meaning ‘with’.

The incorporation approach to denominal verbs has been widely adopted; see e.g. Mateu (2001, 2002, 2008) for an adaptation to Romance languages. One of its major advantages is that it provides an explanation for some strong constraints on denominal verb formation, by appealing to general syntactic rules for incorporation (Baker, 1988). For example, the ungrammatical example in (9) (Hale and Keyser, 2002, p.51) is ruled out because incorporation is head-to-head movement, and incorporation from a specifier is prohibited; hence the nominal *horse* cannot incorporate from the specifier position of the PP. I will discuss other such constraints in Section 3.12.

(9)



intended: ‘saddled the horse (put the saddle on the horse)’

2.5.2 Problem: Cognate and hyponymous objects

One problem that has arisen for incorporation accounts is that of cognate and hyponymous objects. These are a problem for Hale and Keyser since they appear in the position from which incorporation is supposed to have taken place (10). In fact, this problem seemed so bad that Hale and Keyser (2002) renounced the incorporation account of activity unergatives.

- (10) a. I danced a dance. (cognate)
b. She slept the sleep of the dead. (hyponymous)
c. I danced a jig. (hyponymous)

The same analysis could lead to renouncing the location and locatum cases as well, since these have the same problem with hyponymous elements (in this case PPs) appearing in the location where the incorporated nominal should have originated (11).

- (11) a. Mary caged the tiger in a large cage.

Subsequent literature has provided some alternatives for rescuing the incorporation account from the cognate object problem; see e.g. Haugen (2009) who uses the “late insertion” principle to propose that feature bundles at both ends of a movement chain can be pronounced. I will not discuss this issue further, as I focus on other issues with the incorporation account of denominal verbs.

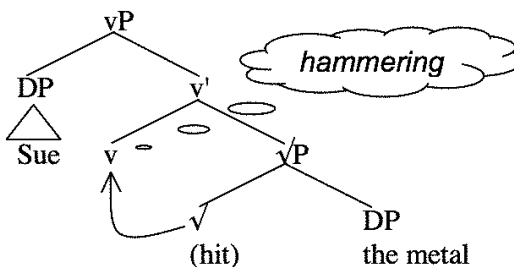


Figure 2.1: Manner incorporation. (Figure from Harley (2005).)

2.5.3 Problem: Instrument verbs

Another problem that has arisen for the incorporation account is the fact that Hale and Keyser’s framework does not predict transitive activity verbs, since the only transitive verbs predicted are the change of state verbs formed with a PP complement; yet among the transitive activity verbs are instrumentals, one of the most common subclasses of conversion verbs. This was observed and addressed by Harley (2005), who proposed a separate mechanism for instrumental verb formation. Harley proposed that instrumentals are formed by “manner incorporation”, the merger of a manner root – in this case a nominal root – directly with the verbal head. She represents the process schematically with a thought balloon as in Figure 2.1, standing in for the mysterious (as described in that paper) nature of the operation. However, the operation is essentially the same as lexical subordination (Levin and Rapoport, 1988; Spencer and Zaretskaya, 1998; Mateu, 2000, 2002, 2005; McIntyre, 2004, and others).

2.5.4 Problem: Double generation of location/locatum verbs

A third problem with the incorporation approach is a problematic prediction about location and locatum verbs, identified by Kiparsky (1997) and represented in Figure 2.2. The problem is that Hale and Keyser propose two abstract prepositions within the same

basic syntactic structure. The preposition of terminal coincidence derives location verbs, while the preposition of central coincidence derives locatum verbs. Hale and Keyser point out that, structurally, the infelicitous sentence *#Jill horsed the corral* cannot be derived from the tree in Figure 2.2 (a), because it would mean incorporating *horse* into the preposition from a specifier position. However, the structure in Figure 2.2 (c), with the preposition of central coincidence and the nouns in reversed positions, does allow this sentence to be derived; moreover, the meaning of the central coincidence relation should allow this as a reasonable representation of the situation where the horse is put into the corral. The reverse situation holds for the infelicitous sentence *#Jill housed the paint*, with the good sentence derived in Figure 2.2 (d) and the infelicitous one in Figure 2.2 (b). Essentially, the incorporation structure generates twice as many location/locatum verbs as it should, unless further constraints are applied.

Kiparsky (1997) proposes a semantic solution that constrains denominal verbs to refer to canonical event types associated with the nominals; this is discussed in detail in Section 5.3. Other work has addressed Kiparsky's observations within the general syntactic incorporation program. Mateu (2001) tackles the problem by proposing that there is only a single abstract preposition for both location and locatum denominal verbs, and indeed for goal verbs (e.g. *braid*, *powder*) as well. Mateu proposes that all telic change of state denominal verbs involve a terminal coincidence relation, thus having the structure in Figure 2.2 (a), and follows Labelle (1992) in the idea that the source nominal describes the end state of the denominal verb, where the end state could be the result of any change of state. This issue will be discussed further in Section 5.3.1.

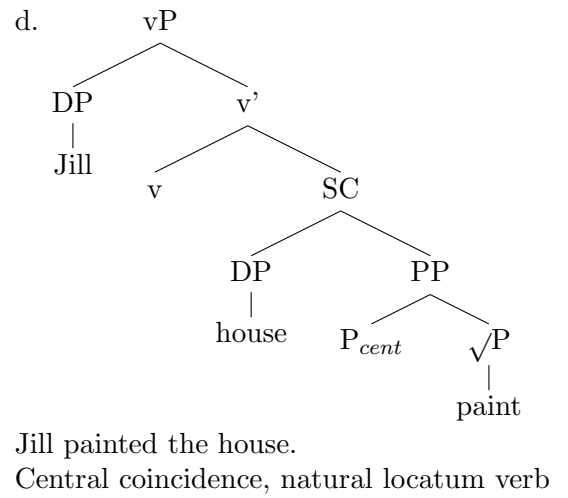
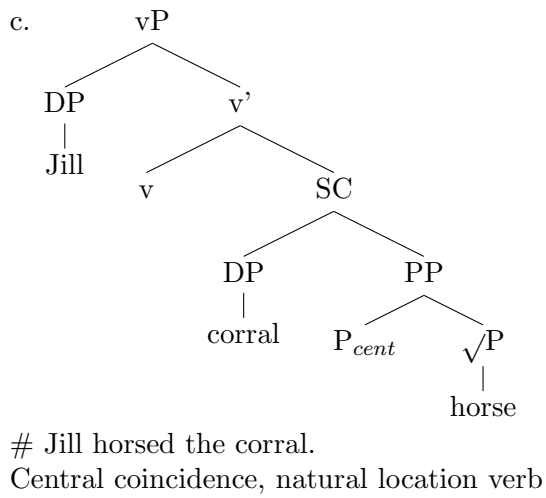
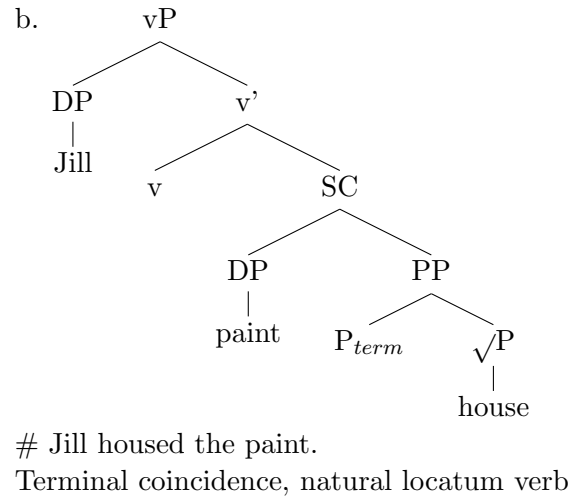
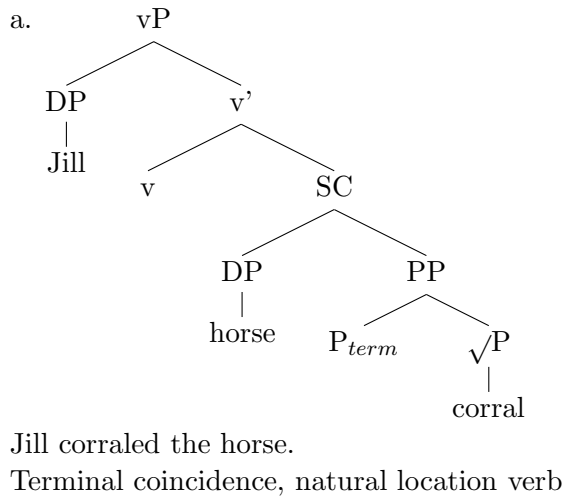


Figure 2.2: Overgeneration of location/locatum verbs in Hale and Keyser (1993) as pointed out by Kiparsky (1997).

2.6 Underspecification Approaches

The other major strand of current morphological theory which addresses the phenomenon of conversion is what I will call underspecification approaches. In this section I discuss some of these approaches along with their major advantages and disadvantages.

2.6.1 Overview of underspecification theories

Underspecification approaches hold that languages have inventories of category-neutral roots (Pesetsky, 1995), what Arad (2005) calls “semantic and phonological cores”. All grammatical categorization – what makes a word appear to be a noun, verb, or adjective – occurs in syntax, when the root is merged with category-specific functional structures. Another term for such approaches is “exoskeletal” (Borer, 2003), since the argument structure of a sentence is considered to be the skeleton into which the idiosyncratic information supplied by the root is made to fit, in contrast with “endoskeletal” approaches which project argument structure from the lexical item. In underspecification approaches, the meaning of a sentence results compositionally from the event and argument structure in the skeleton plus the idiosyncratic information supplied by the root. In such theories conversion is essentially an epiphenomenon, since a homophonous noun and verb in English are surface manifestations of the same uncategorized root being used in different morphosyntactic environments.

One of the major advantages of underspecification approaches is that they account quite clearly for root-and-pattern languages like Hebrew (Borer, 2005a,b; Arad, 2003, 2005), where the contribution of the uncategorized root is transparent, as in Table 2.10.³ Here, the consonantal root *bsl* has a semantic core which has to do with ripening or maturing. Note that verbs, nouns, and adjectives can all be formed from the root.

In languages like English, Borer points to two types of evidence for the exoskeletal

³There are languages without root-and-pattern morphology which nevertheless have very flexible roots. For example, Farrell (2001) discusses the case of Wintu, which has a large number of roots that can appear in both nominal and verbal environments.

Root	Pattern	Word
√ bšl	CiCeC (v)	bišel (cook)
√ bšl	hiCCiC (v)	hivšil (mature, ripen)
√ bšl	taCCiC (n)	tavšil (a dish of cooked food)
√ bšl	miCCaCa (n)	mivšala (brewery)
√ bšl	CaCeC (a)	bašel (mature, ripe)

Table 2.10: Root and pattern morphology in Hebrew (Arad, 2005).

approach. One is the large amount of flexibility that many items have with regard to their surface grammatical category, and the other is the absolute priority given to the syntax, both of which are illustrated in (12). Some of the sentences in (12) are only marginally acceptable, but the fact remains that the root (or in Borer’s terms, “listeme”) $\sqrt{\text{boat}}$, when preceded by a determiner *the*, can only be interpreted as a noun, and when followed by tense marking *-ed*, can only be interpreted as a verb. Even if the hearer cannot easily match the sentence to any real-world events, there is no doubt about which grammatical categories were intended. Borer also draws parallels between grammatical categorization and other cases where structure determines interpretation, e.g. coercion of mass to count nouns in the presence of appropriate functional material.

- (12) a. (the) *dog boat(ed)* (three) *sink(s)*
b. (the three) *sink(s) boat(ed)* (some) *dog(s)*
c. (the) *sink(s) dog(ged)* (the) *boat*

Borer (2005b)

Farrell (2001) also advocates underspecification from a cognitive grammar perspective (Langacker, 1987a,b, 1991, 1999). From this point of view, roots are conceptually represented by event schemas. Categorization occurs in the syntax and causes a certain aspect of the schema to be “profiled”, with nouns and verbs having characteristically

different profiles. For example, \sqrt{kiss} is represented by an event schema of an occurrence of a kiss; when used in a verbal context it receives a “process construal”, but in a nominal context a “things construal”, which in the case of *kiss* refers to the overall event. For \sqrt{bag} , the event schema involves putting items in a bag; the process construal refers to the process of putting in, but the “things” construal refers to the bag itself.

An obvious issue is why some roots are construed as whole events in nominal environments, while others are construed in terms of salient participants – just in the cases that are more traditionally analyzed as deverbal nouns vs. denominal verbs. Farrell proposes that the event schema for \sqrt{bag} contains a salient object, the bag itself, whereas the only salient objects in the schema for \sqrt{kiss} are the participants; as the participants are profiled by derivational morphology such as *-er*, *-ee*, the salient object interpretation is blocked for the bare noun *kiss*. However, kisses do involve some salient objects such as lips, so it is not clear why *a kiss* does not refer to e.g. a pair of lips. Another question, which Farrell does not discuss, is why the \sqrt{bag} event schema involves putting something into the bag, rather than carrying the bag around – this relates to one of the general questions addressed in this dissertation, namely why transitive argument structures tend to be preferred. I believe this question can be more easily addressed in the framework of syntactic exoskeletal approaches such as those of Borer (2005a,b) and Ramchand (2008), which allow for a more nuanced sublexical syntax.

Distributed Morphology (DM) (Halle and Marantz, 1993, 1994; Harley and Noyer, 1999b; Barner and Bale, 2002; Arad, 2003, 2005) also falls under the umbrella of underspecification approaches. In DM, words and phrases are built using a single syntactic mechanism, in contrast to the distinct (sub)lexical syntax of Hale and Keyser. Vocabulary items containing phonological material undergo late insertion into syntactic terminals. Roots carrying idiosyncratic meaning are underspecified for category, and receive category only in the syntax by combining with functional material, which in Distributed Morphology includes not only material such as specifiers and tense marking but specific

categorizing heads known as little *v*, little *n*, and little *a*.

A factor that has received particular attention within a DM framework is the point at which the idiosyncratic contribution of the root becomes fixed. This is considered to occur upon merger with the categorizing heads, i.e. *vP*, *nP*, and *aP* are phases. Once categorized, the resulting structure can be merged with another little *v*, *n*, or *a*, thus recategorizing it – which may or may not involve an overt reflex – but at that point the meaning of the root in context has already been fixed. Again, this is illustrated clearly with Hebrew. In (13a) we see nouns and verbs formed from a single root, and in (13b) we see the result of forming a denominal verb from the already-categorized noun *misgeret*, ‘frame’. This suggests a distinction between “inner” (categorizing) and “outer” (category-changing) morphology, based on both phonological evidence – the consonant *m*- from the original nominalizing pattern is retained – and semantic evidence, namely that something which is actually a frame must be involved.

- (13) a. $\sqrt{\text{sgr}} \Rightarrow \text{CaCaC (v)} \Rightarrow \text{sagar (v, close)}$
 $\sqrt{\text{sgr}} \Rightarrow \text{hiCCiC (v)} \Rightarrow \text{hisgir (v, extradite)}$
 $\sqrt{\text{sgr}} \Rightarrow \text{CoCCayim (n)} \Rightarrow \text{sograyim (n, parentheses)}$
 $\sqrt{\text{sgr}} \Rightarrow \text{miCCeCet (n)} \Rightarrow \text{misgeret (n, frame)}$
- b. $\text{misgeret} \Rightarrow \text{CiCCeC} \Rightarrow \text{misger (v, to frame)}$
 (Arad, 2005)

For languages like English with less transparent morphology, conversion is also accounted for in DM by the syntactic categorization of underspecified roots, but the question remains of what size item is being merged with the categorizing head. Denominal conversion verbs could be the result of inner morphology (formed by categorizing a root) or outer morphology (formed by re-categorizing a noun). Arad (2005) argues that both cases occur in English, and attributes two subclasses of conversion to this distinction based on semantic evidence. It has long been proposed (see Kiparsky, 1982, 1997) that

there are two classes of denominal verbs with null morphology in English: those that can only be elaborated by a hyponymous NP (14a), and those that can be elaborated by any NP (14b). Arad proposes that (14a) is a good candidate for a noun-derived verb, because the meaning of the noun is fixed within the verb, while (14b) is a root-derived verb, since the meaning of the root is negotiated only as it becomes a verb.

- (14) a. *She taped the picture to the wall with pushpins.
b. He hammered the nail with a rock.

This distinction is not uncontroversial, however; see Section 5.4.

Don (2005) gives evidence for a distinction between root- and word-formed words in Dutch as well, based on morphological evidence. See also Barner and Bale (2002, 2005); Panagiotidis (2005) for an ongoing debate about the locus of grammatical categorization. I will be proposing that denominal verbs in English are root-derived, but this is not necessarily the case for all languages or grammatical categories.

2.6.2 Problem: Licensing and overgeneration

One issue with underspecification theories is that they skirt around the notion of licensing of roots. The most extreme versions of underspecification significantly overgenerate, at least for English, because it is not true that every root can occur in every syntactic environment. Even in languages such as Hebrew with inventories of very abstract roots, there are roots which surface only as a single grammatical category; Arad (2005) notes that these tend to be highly concrete, entity-denoting nouns such as *cat*.

Underspecification approaches thus tend to resort to various notions of licensing which in some cases look suspiciously like putting grammatical categories back into the lexicon. For example, Borer (2005b, p.355) discusses the possibility of storing some listemes, along with syntactic structure, as idioms, acknowledging at the same time that “subcategorization, of sorts, is introduced here through the back door, with the

introduction, in lieu of lexical syntactic annotation, of an articulated listed structure, called an *idiom*, which accomplishes, de facto, the same task”.

In DM, Harley and Noyer (1999a,b, 2000) propose that a vocabulary item must be licensed “by appearing in a syntactic context compatible with its requirements”. Harley and Noyer (1999b) propose that vocabulary items are stored with a schema expressing requirements for their context of insertion, for example (15). Harley and Noyer (2000) express the same idea using features for the context, e.g. $\pm v$, $\pm DP$, $\pm causation$. Regardless of the technical device used, the root is effectively stored with information about whether it can appear in nominal and/or verbal contexts, which is quite similar to having grammatical category, although it does allow any given root to be underspecified for category by being licensed in both +v and +DP environments.

- (15) signal \leftrightarrow context of insertion
 /kæt/ \leftrightarrow [DP *D* [LP————]]
 root \surd *cat* inserted in a nominal environment
 (Harley and Noyer, 1999b)

A different approach to the issue is taken by Barner and Bale (2002), who argue that there is no problem of overgeneration. They relegate apparent examples of infelicitous denominal verbs to issues of pragmatics and appropriate context. For example, they point out that (16a) is odd, while (16b) is fine, suggesting that it is correct for the syntax to generate a verb corresponding to every noun.

- (16) a. # John spidered yesterday.
 b. The agile climber spidered up the face of the mountain.
 (Barner and Bale, 2002)

Barner and Bale also follow Clark and Clark (1979) and others in attributing some apparent infelicity in denominal verbs to token-blocking, e.g. blocking of a putative

denominal verb *broom* by an established verb *sweep*, rather than to the generative mechanism for denominal verbs. This is an example of what Embick and Marantz (2008) call “synonymy blocking”, the blocking of a novel word by an established word with similar meaning but a different root. Embick and Marantz argue that synonymy blocking does not exist, but that in general such pairs must occupy different locations in semantic space; for example, *thief* does not block *stealer*, but rather *stealer* will tend to mean something different from *thief* (e.g. not habitual). On this view denominal verb examples like *broom* can also be considered, not as infelicitous, but as meaning something different from *sweep* and therefore possibly requiring a different context; see for example (17).

- (17) Well after a few site meetings the general concensus is that the concretor has broomed the concrete too early. Apparently this is why the white lines appear.
[WWW, spelling errors in original]

While acknowledging that context is highly important in the interpretation of denominal verbs, and that some verbs which seem infelicitous at first glance may be fully acceptable given the right context, we must not lose sight of systematic gaps in acceptability for denominal verb interpretations, or systematic patterns in lexicalization. As Panagiotidis (2005) notes, word-formation exhibits systematic issues of primacy: some roots (traditionally verbs, e.g. *kiss*) systematically have a full-event interpretation in nominal contexts, while others (traditionally nouns, e.g. *bag*) have a “thing” interpretation. Treating all such roots as synchronically underspecified for category would make such generalizations accidental, which is not fully satisfactory.

Underspecification theories as they stand have not yet been pushed to account for well-known systematic gaps in the interpretation of English denominal verbs, such as the impossibility of *#It cowed a calf* to mean ‘the cow had a calf’ (4), or the infelicity of *#horse the saddle* to mean ‘saddle the horse’ (9), which incorporation theories have

already addressed. I believe the underspecification approach provides the framework for doing so, but it is necessary to make some observations concerning the larger structure into which roots are inserted in order to provide a fuller account.

2.7 Experimental, Corpus-Based, and Other Approaches

There have been a relatively small number of experimental and corpus-based studies on conversion. Most of them have focused on various contextual, phonological, or (putative) blocking factors that make denominal verbs easier or harder to produce and interpret. None have focused specifically on argument structure possibilities, but there is support among the experimental approaches for the influence of syntactic context on the interpretation of denominal verbs. I will review the relevant studies here.

Kaschak and Glenberg (2000) performed a study that provides psycholinguistic evidence for the influence of syntactic context on the interpretation of denominal verbs. They compared double object with transitive constructions using novel denominal verbs. For example, subjects were given a scenario about Lyn and Tom in adjoining prison cells with a long, narrow crevice in the wall between. When presented with the sentence *Lyn crutched Tom her apple so he wouldn't starve*, they were more likely to choose a transfer meaning for *crutch*; but when presented with the sentence *Lyn crutched her apple so Tom wouldn't starve*, they were more likely to choose a meaning where Lyn acted on the apple. Goldwater and Markman (2009) obtained a similar result for novel denominal verbs in passive compared with middle constructions.

Kaschak and Glenberg (2000) also studied the affordances of the nouns, i.e. the ways individuals can interact with things in their environment, in this case with the item named by the source nominal. They found that the property of the noun which was most relevant to the scenario – e.g., for a crutch, being long or being sturdy – was more salient than the canonical property associated with the noun, namely being used when one has

an injured leg. Similarly, knowing whether a chair had broken wheels affected subjects' ability to interpret sentences like *Rachel chaired the scientist his mail*. Kaschak and Glenberg use the model of Glenberg (1997), Glenberg and Robertson (1999) to describe how affordances “mesh” with the syntactic constraints to determine the interpretation.

Kelly (1998) noted that among noun classes, some, like vehicles (*bicycle, sled, jet*) form denominal verbs with very regular meanings (in this case, ‘travel by X’); while others, like names of animals (*dog, bird, pig (out)*) are more idiosyncratic. He found that experimental subjects preferred to form sentences containing denominal verbs in what he calls the “rule-derived” (regular) classes, which included vehicles, musical instruments, dances, flavorings, colors, and dwellings. The idiosyncratically-derived classes included animals, body parts, building parts, kitchen utensils, tools, and furniture. Note that Kelly was not concerned with canonical uses of the nouns, but with the heterogeneity of the well-established denominal verbs formed from nouns in the same class.

It would be interesting to investigate the argument structure of the sentences produced by the subjects in Kelly (1998), but no overall analysis of the argument structure used by the subjects is provided, although there is a small sample of the sentences produced by the subjects (18).

- (18) a. (R) She chartreused the sheets.
b. (I) She dinnetted the living room.
c. (R) The tea was cinnamoned before it was served.
d. (I) The killer skeletoned his victim; flesh was everywhere.
e. (R) We elevatorod up to the fifth floor.
f. (I) Alligatoring along, it took her a very long time to complete her walk.
g. (R) She made her pizza spicy because she paprikaed it.
h. (I) Whenever he gets scared, he iguanas.

(Kelly, 1998, underlining mine; R = rule-based, I = idiosyncratic)

Hanna and Gerrig (2006) asked subjects to create sentences with novel denominal verbs, and measured transitivity preferences for individual verbs as well as for verb classes. For individual verbs, they found a range of preferences from strongly intransitive (*to cocktail, to sidewalk*) to strongly transitive (*to toothpaste, to bedtime-story*). The results presented on the transitivity preferences for classes such as location, locatum, goal, and instrument verbs are problematic, however, since Hanna and Gerrig assigned verbs to classes in advance of the study, without reference to the actual usage in the elicited sentences, whereas any given nominal can surface in different verb classes depending on context. For example, their locatum verb category includes *to tofu, to cocktail, to pajama*, and *to bedtime-story*, but it is not immediately obvious that all uses of these denominal verbs would be in the locatum class. Thus the only conclusion I draw from this study is that transitivity preferences vary across source nominals.

2.8 Conclusions

This chapter has reviewed some of the major previous work on English denominal conversion verbs and the predictions that are made about argument structure and denominal verb productivity. A satisfactory theory needs to walk a fine line between generating the full range of denominal verb possibilities, in terms of semantics and argument structure, and at the same time accounting for systematic constraints on interpretation of denominal verbs. I have suggested that an output-oriented approach to denominal verb classes is desirable for taking stock of argument structure and interpretation possibilities, and that an account of constraints on denominal verbs should be attempted within an underspecification framework.

ARGUMENT STRUCTURE POSSIBILITIES FOR
DENOMINAL VERBS

3.1 Introduction

Conversion of nouns to verbs – by which I mean the formation of verbs from nouns without overt morphology – is highly productive in English; Prasada and Pinker (1993) estimate that approximately 20% of verbs in English fall into this category.¹ Along with the well-established denominal verbs, formation of innovative denominal verbs is quite common. A well-known example (Clark and Clark, 1979) involves two friends who know that a third friend, Max, likes to rub people with teapots; one of the first friends can felicitously say “This time Max has gone too far: he tried to teapot a policeman.” For a comprehensive study of denominal verbs, including innovative uses, see Clark and Clark (1979). Similarly, in a recent study on productivity, Plag (1999) provides a list of some 450 denominal verbs added to the Oxford English Dictionary in the twentieth century, indicating the high productivity of the process – far greater than the number of new *-ize* verbs in the same time period.

Characterizing the possible meanings of denominal verbs is of interest because it can

¹In this chapter, I will use *conversion verb* and *denominal verb* as descriptive terms to refer to denominal verbs without overt derivational morphology. I imply no theoretical commitment with these terms.

provide clues about the underlying morphosyntax of these verbs. Identifying subregularities and constraints on denominal verb meaning is of particular importance. A number of previous studies (Adams, 1973; Clark and Clark, 1979; Quirk et al., 1985, and others) have focused on the semantic relation between the source nominal and the event picked out by the denominal verb to formulate semantic templates for various denominal verb classes. Such studies have resulted in taxonomies of possible roles – such as instrument, location, locatum, and goal – which can be played by the source nominal. The semantic templates for the resulting verb classes are formulated in the style of lexical conceptual structures involving the source nominal, the verb’s arguments, and some (often light) verbal material; for example, locatum verbs like *saddle* and *salt* might be represented as ‘provide OBJ with N’ (see Section 2.4 for a review). Though the semantic templates are not intended to be taken as a syntactic analysis, they are suggestive of a morphosyntax for denominal verbs that reflects the elements in the template.

Due to the prevalence of difficult-to-categorize examples like *lip* ‘in golf, fail to go in the cup’ (Clark and Clark, 1979) or *snooker* ‘to place in an impossible position’ (Gottfurcht, 2008), it has also been claimed that the possible interpretations of denominal conversion verbs in English are not expressible by a fixed set of templates, but rather are limited only by context and pragmatics. Clark and Clark (1979, p.783) say that conversion verbs “have an indefinitely large number of potential senses, and their interpretation depends on the context, especially the coöperation of the speaker and listener.” Aronoff (1980) says that “the meaning of the verb is limited only to an activity which has some connection with the noun”.² Bauer (1983, p.226) says that “if there are constraints on conversion they have yet to be demonstrated”, and Plag (1999, p.220) states that there is a “growing consensus in the linguistic literature that the variety of meanings that can be expressed by zero-affixation is so large that there should be no specific meaning attached to the process of zero-affixation at all.” Recent syntactic theories proposing

²Note that “activity” in Aronoff’s terminology refers to an event in general, with no aspectual implication.

that nouns and verbs are formed from uncategorized roots which receive a nominal or verbal interpretation from the syntactic context (Halle and Marantz, 1993, 1994; Borer, 2005a,b) also emphasize the high level of category flexibility of English roots, placing no particular restrictions on the possible meanings of roots in verbal contexts.

There are, in fact, some well-known constraints on denominal verb meaning in English that go beyond pragmatics. One of the most influential theories of denominal verb formation in the last two decades, the incorporation theory, proposes a structural source for denominal verbs in which they are derived in sublexical syntax by incorporation from specific syntactic configurations (Hale and Keyser, 1993, 1997a, 1998, 2000, 2002; Mateu, 2001; Harley, 2005). These configurations along with the standard assumptions about incorporation place limits on possible interpretations. This theory is able to account for certain systematic gaps, e.g. the fact that *#it cowed a calf* is not a legitimate way to express ‘the cow had a calf’.

In this chapter I address a little-studied constraint on the productivity of denominal verb formation. The constraint is related to intransitive conversion verbs, which are infelicitous when the intended interpretation has the source nominal as a theme, patient, or holder of a result state (19).

- (19) a. #Mary was appling at lunch today.
intended: ‘eating apple(s)’ (theme)
- b. #Pat has been booking all afternoon.
intended: ‘reading/writing book(s)’ (theme)
- c. #Amy finished lawning this afternoon.
intended: ‘mowing the lawn’ (theme)
- d. #Susan was shirting when I saw her.
intended: ‘wearing a shirt’ (patient)
- e. #Beth was catting in the afternoon sun.
intended: ‘petting/feeding/etc. a cat’ (patient)

- f. #It was stuffy inside, so Lee went around windowing.
intended: ‘opening windows’ (result state holder)

This infelicity is especially surprising in the case of incremental themes, where the relevant interpretations are readily available in complement coercion; cf. *Mary finished the apple* (‘eating’), *Pat began the book* (‘reading/writing’), *Amy finished the lawn* (‘mowing’).

To account for this constraint, I propose that denominal verb formation in English is the result of lexical subordination, which Harley (2005) refers to as “manner incorporation”: merger of a nominal root with a verbal subeventual syntactic structure. I argue that this analysis can account for the full range of denominal verbs while also not generating the missing readings, which I argue in Section 3.3 are incorrectly generated by incorporation approaches, at least as these approaches are presented in previous literature. The lexical subordination proposal predicts that denominal verbs should appear in the same set of verbal argument and event structure constructions as verbs from verbal roots, which is borne out by a corpus study in Chapter 4. Of particular interest are denominal verbs that participate in transitivity alternations, which are not predicted by current incorporation theories. I will also discuss the possible interpretation of attested intransitive denominal verbs.

3.2 Data: Nominal Roots, Interpretation Constraints

This section presents some basic data. I begin by considering the size of the nominal element involved in denominal verbs, concluding that they are nominal roots. I then look at a variety of infelicitous examples where the intended reading involves the source nominal as an incremental theme, patient, or resultee, and review Hale and Keyser’s examples of infelicitous agent and cause interpretations.

3.2.1 Nominal roots

Let us first look at the size of the nominal element involved in denominal verbs. It is clear that the nominal must be, at largest, a bare noun and not a DP, since determiners and plural markers are not observed. Here we address the question of whether the nominal is a noun (N) or a root (\surd) in the sense of Pesetsky (1995), i.e. a unit of idiosyncratic meaning smaller than the word, what Arad (2005) calls a “semantic and phonological core”. Although underspecification approaches to denominal verb formation (see Section 3.3.3) propose that the element involved is an uncategorized root, this is not assumed by all theories, so it is worth reviewing the evidence.

The noun vs. root distinction is easier to diagnose in some languages than others. In root-and-pattern languages such as Hebrew it is easy because the consonantal root is not pronounceable on its own, and as soon as a root is combined with categorizing morphology it acquires signs of the pattern that categorizes it; we saw examples of this in Section 2.6. Hebrew has what Bloomfield (1933) refers to as “vague” roots, i.e. very general in their meaning and able to take on many different shades of meaning in different contexts, while English has “roots as free forms”, a larger inventory of unbound roots with more specific meanings. In languages like Italian with rich inflectional morphology, it is also fairly clear when two words of different categories are formed from a common root (20). The rich inflectional morphology of Italian, in comparison with the impoverished inflectional morphology of English, makes it easier to diagnose the presence of words rather than roots.

- (20) *pettine*, comb *pettinare*, to comb
spazzola, brush *spazzolare*, to brush
pala, shovel *spalare*, to shovel
scopa, broom *scopare*, to sweep
corsa, run *correre*, to run

starnuto, sneeze *starnutire*, to sneeze

risata, laugh *ridere*, to laugh

sale, salt *salare*, to salt

sella, ‘saddle’ *sellare*, to saddle

The most reliable way to make the diagnosis in English is to test whether overtly derived nouns, i.e. nouns containing overt deverbal, deadjectival, or denominal affixes, can participate in conversion, since such nouns are clearly nouns and not roots. It has been long been observed that derived nouns are rare as sources for denominal verbs (Marchand, 1969; Cannon, 1985). For example, Cannon (1985) performed a dictionary corpus study, and of 189 denominal verbs formed by conversion, found none with a deverbalizing suffix (*-en*, *-ify*, *-ize*). He did find a small number of affixed forms, but argued that they are relatively opaque, e.g. *cassette*, *decrement*, *decrease*, *leaflet*, *leverage*, *metallide*, *wheeler-dealer*, *format*. He also found 72 compounds.

Examples showing that overtly derived nouns are not felicitous as sources for denominal verbs can be seen in (21) through (24), where the felicitous (a) examples are from the WWW, and the (b) examples are attempts to form equivalent denominal verbs. The (a) examples show that the intended interpretation is readily available in context.

- (21) a. For example, if employee X was typically happy during the off work hours, then he was frequently happy during the work hours. [WWW]
b. * Employee X frequently happinessed during the off work hours.
- (22) a. If you recently conducted a transaction at one of our stores and were not provided with a receipt, we'd like to know about it. [WWW]
b. * You recently transactioned at one of our stores.
- (23) a. On the other hand, Lustro is a devotee of the CouponMom Web site, a sort of miracle site that tells you which items are discounted at which stores in

your geographical area. [WWW]

b. * LUSTRO devotees the CouponMom Web site.

(24) a. Jerry and Sharon Quint, who live in the neighborhood, said if the lots are turned into duplexes, they will consider moving. [WWW]

b. * Jerry and Sharon Quint, who neighborhood, said they will consider moving.

It is necessary to choose such examples with care because, as noted by Marchand (1969, p.373), many nominalizing suffixes are deverbal, and “it would be contrary to reason to form such verbs as *arrival*, *guidance*, *improvement*, *organization* when *arrive*, *guide*, *improve*, *organize* exist”; see also Bloomfield and Newmark (1963, p.340); Cannon (1985). There are cases in which the deverbal noun is opaque or has acquired a different sense from the base verb, and a denominal verb can be formed, e.g. *proposition* as opposed to *propose*. Even if denominal verbs formed from deverbal nouns do compete with the base verb, however, this issue would not account for the infelicity in (21b) and (24b), where the infelicitous verb is based on a deadjectival and a denominal noun, respectively. It could affect (22), although my intuition is that *transact* is not in frequent use in colloquial speech, and thus less likely to compete. In (23), the denominal verb would have to compete with the base verb *devote*, which requires a different argument structure from the simple transitive in (23b), again making it less likely to compete.

To further confirm the situation with overtly derived nouns, I performed a search in CELEX (Baayen et al., 1995) for multimorphemic nouns that are also conversion verbs (using the coding for conversion verbs within CELEX), yielding 202 items. Inspection shows that many of the items are root compounds (e.g. *wallpaper*, *catcall*, *pigeonhole*, *short-list*, *blackguard*, *shepherd*). This is expected, as e.g. Jespersen (1942, p.102-3) points out that verbs can be freely formed from compounds in English, both N+N and ADJ+N. There are a very small number of synthetic compounds (e.g. *steamroller*).

There are some instances that appear to involve derivational affixes with bound roots (e.g. *pontificate*, *distance*) or where the derivational morphology is synchronically opaque (e.g. *shutter*, *layer*, *referee*, *package*, *question*, *counter*, *mountaineer*, *profiteer*, *sculpture*). Arguably none of these involve productive formation of denominal verbs from nouns which are synchronically perceived as already derived; as with the data from Cannon (1985), the formally complex items may have been reanalyzed by speakers as roots, meaning that their internal structure is not perceived. Marchand (1969) also notes similar cases such as *herring*, *nothing*, *pudding*, *worship*. There are a small number of items in the CELEX search results that appear to involve genuine derivational morphology (e.g. *inconvenience*, *certificate*, *commission*, *disillusion*, *disfavour*, *affix*, *reverence*), but the number is sufficiently small that the process can be considered unproductive.

An inspection of Plag's (1999) list of approximately 450 twentieth-century OED neologisms formed by conversion of nouns to verbs shows a similar pattern. Most are monomorphemic (e.g. *ball*, *nap*, *petal*, *tango*, *vacuum*) or root compounds (e.g. *blockhouse*, *cartwheel*, *whiplash*, *milestone*, *bottleneck*, *keyboard*). Again there are several cases where derivational morphology is opaque (e.g. *coiffure*, *jigger*, *arbitrage*, *frontage*, *clipper*, *flipper*, *junction*, *audition*). There are also one or two cases that seem to involve more productive derivational morphology (e.g. *proposition*, *retrofit*, *leverage*). Again, unsurprisingly, these cases show semantic drift from the original base form, e.g. *to leverage* has a specific meaning which is not part of the meaning of *lever* as a noun or verb; and again it is fairly clear from the small number of examples that productive noun-forming morphology does not feed conversion. This is particularly interesting in Plag's dataset since the focus on more recently coined verbs means that overtly derived nouns have had more time and opportunity to undergo conversion than in the CELEX data. I conclude that the nominal element involved in conversion is a root, and assume this for the rest of the dissertation.

3.2.2 Interpretation constraints: Themes, patients, and resultees

The primary constraint on English denominal verb formation we will consider is the case of intransitive denominal verbs where the source nominal is intended to be interpreted as an object of the verb: an incremental theme, patient, or holder of a result state.

Typical incremental theme verbs (Dowty, 1991; Krifka, 1992) include creation and consumption verbs, as well as other verbs where the object of the verb measures out the event, e.g. mowing a lawn or cleaning a table. The infelicity of verbs with an intended incremental theme interpretation is shown in (25).

- (25)
- a. #Mary was applying at lunch today.
intended: ‘eating apple(s)’ (consumption)
 - b. #Susan was beering a lot last week.
intended: ‘drinking beer’ (consumption)
 - c. #Pat was booking all afternoon.
intended: ‘reading/writing book(s)’ (consumption/creation)
 - d. #Julie was housing last year.
intended: ‘building house(s)’ (creation)
 - e. #Beth has been portraiting.
intended: ‘painting portrait(s)’ (creation)
 - f. #The wreckers were stationing.
intended: ‘destroying the station’ (consumption)
 - g. #The orchestra symphonied in tremendous fashion for an hour.
intended: ‘played a symphony’ (consumption)
 - h. #Amy has finished lawning and now she’s ready to come inside.
intended: ‘mowing the lawn’ (other incremental theme)
 - i. #The cleaner was chairing.
intended: ‘cleaning the chairs’ (other incremental theme)

The putative verbs in (25) are examples of what Clark (1982) refers to as *characteristic activity verbs*, since the (intended) meaning is a characteristic action done to the noun; she observes that children produce such verbs in English while adults do not. To the best of my knowledge the only other previous observation regarding their infelicity is in Harley (1999, 2005) who notes that “verbs of creation with conflation in English are restricted to cases where the subject is creating the Theme in an inalienable way, usually ‘out of’ the subject’s own body. Hence one can say *Jill drooled* but not *Jill caked*, meaning ‘Jill made a cake’.” I will address this observation in Section 3.10.1.

The theme constraint is especially surprising since the relevant interpretations are readily available in complement coercion; cf. *Mary finished the apple* (‘eating’), *Pat began the book* (‘reading/writing’), *Amy finished the lawn* (‘mowing’). In these cases the object nominal is given an event interpretation which is by default the accomplishment verb representing the canonical use of the object (cf. Pustejovsky, 1995), so we know that such an event interpretation is coercible from these nouns.

Similar examples with patients (undergoers in the terminology of Ramchand (2008)) are seen in (26), where the intended reading is an activity strongly associated with the noun, but is unavailable as an interpretation of the denominal verb.

- (26)
- a. #Mary was balling on the playground.
intended: ‘throwing ball(s)’
 - b. # Susan was shirting when I saw her.
intended: ‘wearing a shirt’
 - c. # Pat was catting.
intended: ‘petting/feeding/etc. a cat’
 - d. # Julie was babying.
intended: ‘feeding/holding/etc. a baby’

It is not possible to construct parallel examples showing that these event types are

coercible from the given patient nouns, as we did for the theme nouns, because complement coercion is not felicitous with patients (cf. *#Mary finished the shirt* on the ‘wearing the shirt’ interpretation). However, the intuitive connection between the intended event type and the nouns in (26) should be reasonably clear (though I have not attempted to quantify it), so the unavailability of patient interpretations is surprising, especially since mutual interpretability to speaker and hearer is considered one of the key criteria for denominal verb formation (Clark and Clark, 1979).

Finally, we look at nouns that have a strong association with change of state verbs (27). Again, the denominal verb does not have the intended reading, which would be one where the source nominal serves as the holder of the result state.

- (27) a. *#The children piñataed at the end of the party.*
 intended: ‘broke a piñata’
- b. *#Susan had been windowing to let some air into the room.*
 intended: ‘opening a window’
- c. *#The expert was bombing when I entered the room.*
 intended: ‘defusing a bomb’

In each case in (25) through (27), we have an intransitive denominal verb that is infelicitous on the intended reading where the source nominal is an object of the verb – an incremental theme, patient, or holder of a result state. I propose that these examples represent a generalization and not a set of accidental gaps. For comparison, there are denominal verbs based on many animal names, e.g. *dog*, *parrot*, and *fish*; the fact that a particular animal name such as *iguana* is not an established verb seems to be an accidental lexical gap (conditioned by pragmatic factors).

The theme examples (25) do not seem to be of this type, as a wide variety of e.g. food, drink, and reading material can be substituted without making the sentences more felicitous. It is more difficult to show that the patient examples (26) are not accidental

gaps, since verbs taking patients are more common than those taking incremental themes, and as a result there is a wide variety of possible verb-patient pairs to consider. For example, well-attested intransitive vehicle denominal verbs like *boat*, *bicycle* could be the object of verbs such as *ride*, making them positive examples of patient denominal verbs. I have not undertaken a comprehensive study of possible verbs and patients which might appear in this construction, but the examples in (26) at least do seem fairly regular; for example one could substitute a wide variety of clothing items in (26b) or animals in (26c) without making the sentences more felicitous.

It is also somewhat difficult to establish whether the resultee examples in (27) are accidental gaps, since comparatively few nouns seem to have canonical events that involve result states. On the other hand, I am not aware of any positive examples of intransitive denominal verbs where the source nominal is a resultee. Thus there seems to be a systematic constraint on the theme, patient, and resultee readings, rather than a set of accidental gaps.

We must then ask about the nature of the constraint. It does not seem to be tied to particular roots, since some of the infelicitous verbs shown above can be made more felicitous with additional context, either linguistic context or real world context. Regarding real world context, casting the verb as professional jargon seems to help hearers accommodate it. For example, suppose that Mary works in a fruit-packing plant. She might reasonably say to her colleague, *Are you appling or oranging today?* as a kind of shorthand. Informants have consistently told me that they are willing to accommodate some of the more doubtful denominal verbs if they can construe them as “terms of art”.

Regarding linguistic context, argument frames that are more complex than simple intransitives seem to improve the felicity of the verbs (28).

- (28) a. Mary applied Betty.
b. Mary applied Betty on the head.
c. Mary applied into the room.

- d. The audience appld the performer off the stage.
- e. Mary has been appling it (up) all week.
- f. Mary was appling away yesterday at lunch.

The acceptability of the examples in (28) varies; certainly they are not all fully acceptable out of the blue. However, my judgement along with that of other native speakers I have consulted suggests that these are easier to interpret than the intransitive. (28c) is probably the worst of the bunch, but even then informants report imagining that Mary enters the room rolling on apples, or handing out apples as she goes. In fact, in some frames it even seems possible to get an interpretation that involves eating apples, especially in (28e) and (28f), or even (28d) if the performer is allergic to apples, and the act of the audience biting into the apples releases allergenic droplets from the fruit.³

In fact, many of the infelicitous verbs from examples (25) through (27) are perfectly acceptable as transitive verbs (29).

- (29)
- a. People often managed to house many children in these small cottages 150 years ago.
 - b. It was raining heavily when I took this photograph, so I covered my camera with an umbrella as I stationed the camera on the tripod.
 - c. Chairing an effective meeting is a skill.
 - d. I looked back at Trey and he was balling his fist.
 - e. Sully Baseball has an entertaining new video up about babying pitchers.
 - f. Never in the history of the draft have the various media experts beaten up on a guy the way they're piñata-ing Al Davis for his draft picks.
 - g. When I play the game, would it make the pc unstable if i windowed the game and carried on chatting to people through msn messenger[sic]!!
(all from WWW)

³Thanks especially to Richard Kayne for detailed discussion of these examples.

From this we can conclude that the problem does not lie with particular nominal roots. Rather, the problem lies with particular interpretations of these roots as intransitive verbs.

If particular roots are not the problem, perhaps the constraint has something to do with intransitive denominal verbs themselves. If intransitives were systematically unavailable, we could seek an explanation in terms of the underlying syntax. However, we can immediately observe that there is no absolute prohibition on intransitive denominal verbs, since they are readily attested. Clark and Clark (1979) include a number of them, and some examples from the BNC, obtained from the corpus study in Chapter 4, can be seen in (30).

- (30)
- a. Slaving away at his job, even on a Sunday.
 - b. I've got a cousin who farms not far from the village and I used to stay there in the holidays when I was a girl.
 - c. Seconds later he was on the phone again, bulling into the next prospect.
 - d. Hoover feuded with the CIA for decades and even, in 1970, shocked Washington by breaking relations between the agencies altogether.
 - e. Le Tissier went on a run that took him ghosting past two defenders only for Baker to save.
 - f. She'd been entertaining Nathan in Tammuz's office, messing with the computer.
- (all from BNC)

Thus the constraint we have observed seems not to be on particular source nominals, nor a prohibition on a particular surface syntactic structure. Rather, there seems to be a particular set of interpretations in a particular syntactic context which is unavailable.

3.2.3 Transitive lexicalizations

I also observe that there seems to be a tendency in English for denominal verbs to be lexicalized with transitive frames even when an intransitive one is equally plausible for the same source nominal. The classic example *porch the newspaper* from Clark and Clark (1979) is more felicitous than the equally plausible #*porch* ‘sit on a porch’. Additional examples are in (31).

(31) Transitive lexicalizations:

<i>juice</i>	‘to get juice from something’	#‘to drink juice’
<i>bag</i>	‘to put something in a bag’	#‘to carry a bag’
<i>saddle</i>	‘to put a saddle on something’	#‘to ride with a saddle’
<i>book</i>	‘to put something in a book’	#‘to read a book’
<i>ball</i>	‘to have sex with someone’	#‘to throw a ball’
<i>spoon</i>	‘to pick something up with a spoon’	#‘to use a spoon’

I believe that the transitives are so well-established that the possibility of deriving an equally plausible intransitive verb from the same root is easy to overlook. Moreover, this apparent tendency may be linked to the constraint on object interpretations, since difficulty in interpreting some intransitives may make it more likely that denominal verbs will be lexicalized as transitive. However, as yet it is not clear whether this tendency is a genuine phenomenon; it will be verified and measured in the corpus study in Chapter 4.

There is very little previous literature addressing the argument structure of English denominal verbs, specifically any transitivity bias. Jespersen (1942, p.108-9) does observe that “When from a sb [substantive] is formed a vb which from its signification must be intransitive, there is a strong tendency to add *it* as a kind of ‘empty’ object.” His examples are in (32).

- (32) a. cat it (up a water-pipe)
b. she could not heroine it into so violent and hazardous an extreme

- c. Well, I must man it out
 - d. we would sleep out on fine nights; and hotel it, and inn it, and pub it when it was wet
 - e. shall we cab it or bus it?
- (Jespersen, 1942)

He also observes that some names of drinks can be felicitous verbs, e.g. *wine* (see Section 3.10), but that names of food rarely are: *#bread*, *#meat*, although *grub* is a possibility (p.96). However, there have been no previous formal studies on this topic.

3.2.4 Interpretation constraints: Agents and causes

In this section I review an additional constraint on the interpretation of the source nominal, namely that it cannot be interpreted as an agent or cause (i.e. an initiator, in the terms of Ramchand (2008)) of the event. Hale and Keyser (1993) discuss examples like (33), proposing that it is ungrammatical because *cow* cannot move from specifier position of a verbal projection to supply the phonological signature for the verb (with the expletive subject appearing in place of the moved specifier; see Section 3.3.2).

- (33) * It cowed a calf.
intended: ‘a cow calved / had a calf’

Hale and Keyser’s agent examples are transitive, but there are similar intransitive examples (34). In (34a), *mosquito* cannot be interpreted as an agent, with *Mary* as an (unaccusative) subject, despite the fact that biting is a canonical event associated with mosquitos. A similar situation holds in (34b), where *tornado* is a cause rather than an agent (both examples due to A. Marantz, pc). Note that (34) differs from acceptable examples of what Clark and Clark (1979) call “agent denominals”, such as *Mary waitressed*, where the surface subject *Mary* is the agent and the verb describes actions undertaken by Mary herself. Instead, the intended readings of (34) introduce a

new participant that is not the subject of the sentence, but acts as an agent or cause.

- (34) a. # Mary was mosquito-ing all night.
intended: ‘mosquitoes were biting Mary’
- b. # The town tornadoed to the ground.
intended: ‘a tornado brought the town to the ground’
- (A. Marantz pc)

3.3 Previous Literature

There has not been much literature concerned specifically with the transitivity of denominal verbs. As mentioned in Section 3.2.2, Clark (1982) observes that children but not adults produce characteristic activity verbs. Aronoff (1980) observes that denominal verbs can occur in multiple subcategorization frames, including transitive and intransitive, proposing that denominal verbs are the result of a word-formation rule which carries no subcategorization information. However, Aronoff’s notion is too inclusive to explain the constraints discussed in Section 3.2. The incorporation theory of Hale and Keyser (1993) addresses structural constraints on denominal verb formation, focusing on unergative and change of state verbs, although not addressing the theme/patient/resultee constraint.

In this section I will look at three main approaches to conversion. First, that of Clark and Clark (1979), which proposes that the source nominal fills an argument role of the verb. Second, that of Hale and Keyser (1993) as extended by Mateu (2001) and Harley (2005), the incorporation analysis of denominal verb formation. Third, I will touch on underspecification theories like that of Halle and Marantz (1993, 1994); Borer (2005a,b); Arad (2005), in which roots are untyped and the verbal category is imposed only in the syntax.

3.3.1 The semantic approach of Clark and Clark (1979)

First we look at Clark and Clark (1979). As Aronoff (1980) points out, their theory contains both a pragmatic and a more formal semantic aspect. The semantic aspect states that the verb must be interpreted so that “the parent noun denotes one role in the situation, and the remaining surface arguments of the denominal verb denote other roles in the situation” (787).

Clark and Clark provide an extended example using the denominal verb *porch* as in (35a). From world knowledge about porches, the hearer retrieves the fact that things can be on porches, and posits the relation in (35b). The *newspaper* fills the role of the variable x , yielding (35c). Then, to interpret the role of the surface subject *the boy*, the hearer hypothesizes a causative structure, yielding the final interpretation in (35d).

- (35) a. The boy porched the newspaper.
b. ON(x , a porch)
c. ON(the newspaper, a porch)
d. CAUSE(DO(the boy, something),
COME-ABOUT(ON(the newspaper, a porch)))

There is certainly something to the intuition that the source nominal plays a role in the denoted event which is not played by any of the surface arguments.⁴ However, the implementation of this idea by Clark and Clark (1979) incorrectly produces the infelicitous intransitive examples. Consider a hypothetical interpretation for the verb *apple* in (36a) analogous to Clark and Clark’s for *porch*. From world knowledge about apples, the hearer could retrieve the fact that apples are often eaten, and posit the relation in (36b). The surface subject, *Mary*, can fill the role of the variable x as in (36c), and the interpretation should be complete. All creation and consumption verbs

⁴Stiebels (1997) addresses this idea in terms of the thematic hierarchy, with the incorporated nominal interpreted lower in the hierarchy than the overt arguments.

have the same problem, as do hypothetical verbs formed from patients such as *shirt*, where the relevant relation would be WEAR.

- (36) a. # Mary appled.
b. EAT(*x*, apple).
c. EAT(Mary, apple).

It is also not entirely clear how the analysis in Clark and Clark (1979) can handle manner of motion denominals like *ghost* in (30e), repeated here as (37), since a ghost does not play any argument role. It might, however, be possible for the hearer to hypothesize a relation like ACT-SIMILAR(*x*, ghost).

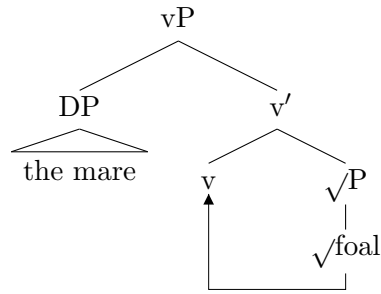
- (37) Le Tissier went on a run that took him ghosting past two defenders only for Baker to save.

3.3.2 The incorporation theory of Hale and Keyser (1993)

We now turn to one of the most influential theories of denominal verb formation, that of Hale and Keyser (1993), who propose that denominal verbs are formed by a process of incorporation. (Hale and Keyser propose a subtype of incorporation called conflation; I will use the two terms interchangeably since the distinction does not concern us here.) Hale and Keyser account for two classes of denominal verbs: location/locatum (transitive change of state) and unergative.

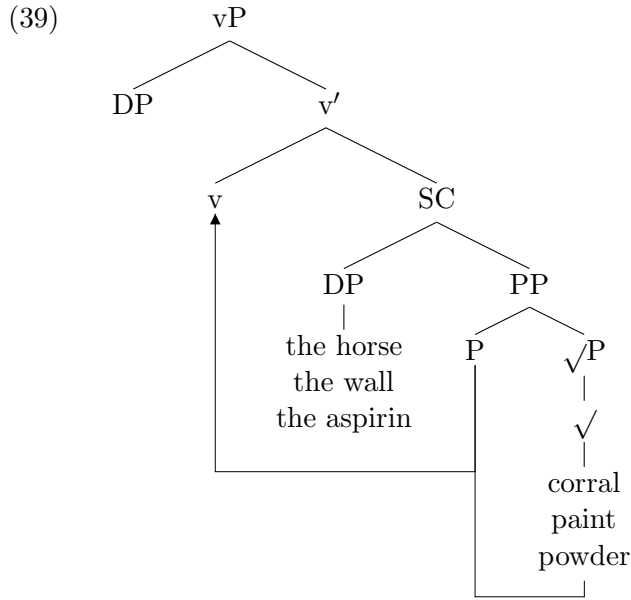
Among unergative verbs, Hale and Keyser include verbs such as *dance* and *laugh* (which I would categorize as being formed from verbal roots – see Chapter 4), and verbs of birthing, as in (38). A nominal root originates as the complement to a null verb, and undergoes incorporation in order to supply a phonological signature to the verb.

(38)



The mare foaled.

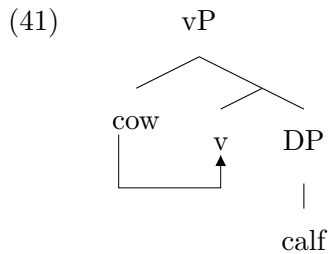
For location/locatum verbs, which fall under the category of transitive change of state verbs, the nominal root first incorporates into a null preposition before incorporating into a null verb. Hale and Keyser propose two different null prepositions for location and locatum verbs: one of “terminal coincidence” (‘into/onto’) and the other of “central coincidence” (‘with’). However, I assume the refinement of Mateu (2001), in which only a single preposition is involved in both types of change of state verbs, that of terminal coincidence; this helps to account for the observation of Kiparsky (1997) that e.g. *paint the house* is felicitous while *#house the paint* is not (see Section 2.5.4). Mateu assimilates goal verbs such as *powder the aspirin* to the same analysis, proposing that all telic change of state denominal verbs involve an abstract terminal coincidence relation, which represents telicity, as shown in (39). Without this assimilation there is no way to represent goal verbs in Hale and Keyser’s analysis.



The analysis in Mateu (2001) for telic change of state denominal verbs: *corral the horse, paint the wall, powder the aspirin*.

The incorporation theory makes some predictions about argument structure constraints for denominal verbs. First, since standard assumptions require that the incorporated element originate in a complement (c-commanded) position, incorporation from specifiers is prohibited. This correctly predicts that sentences like (40) with the hypothetical derivation in Figure (41) are prohibited. (Note that pleonastic *it* is inserted in the empty subject position left by movement of *cow*.)

- (40) * It cowed a calf.
 ‘the cow had a calf’



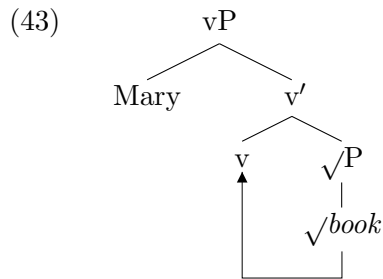
Impossible derivation involving incorporation from specifier (subject) position.

Second, Hale and Keyser predict that location and locatum verbs are necessarily transitive, as in (42), because they are built on a structure involving a single verbal projection containing a PP. The PP cannot stand on its own as a predicate, and an external argument is required. In Section 3.12 I will show how I can account for these predictions without incorporation.

- (42) a. *The book shelved.
b. *The horse saddled.

Hale and Keyser do not provide an account of instrumental denominal verbs, which form a large subclass of denominal verbs (Clark and Clark, 1979). For these verbs, I assume the extension of Harley (2005), who posits a notion of “manner incorporation”, a kind of lexical subordination; see Section 2.5.3.

There are some known issues with the incorporation theory of denominal verbs, including issues with cognate objects. However, I will focus on a previously undiscussed problem, namely that the theory as generally presented in the literature incorrectly generates the infelicitous intransitive readings where the source nominal is intended to be the object of the verb. Consider the derivation in (43), which exactly mirrors that in (38) for the verb *foal*.



#Mary booked.
Incorrectly predicted intransitive.

In terms of the syntactic structure, there is nothing in the incorporation theory that prevents (43) from being derived. Hale and Keyser do not address such putative verbs, and I am not aware of any attempts in previous literature to show why they are infelicitous. However, there are some potential arguments which could be made against the derivation in (43) within the incorporation approach. Specifically, perhaps there are restrictions on either the meaning of the null verb, or the roots permitted in complement position, which could account for the data.

It could be argued that there is no available interpretation for the null verb that would allow the correct semantics for these denominals. Such an approach is not taken in previous literature, however. For Hale and Keyser (1993) the verb meaning is underspecified, and determined by the syntactic environment; e.g. it is interpreted as an activity verb in the unergative configuration and a causative verb in the change-of-state configuration. Hale and Keyser (1997b) compare unergative verbs (formed by hypothesis from a null V with a nominal complement) to overt creation verbs like those in (44), saying that the overt examples “correspond rather closely to the elemental abstract verb of unergatives. That is to say, their semantic content is close to the primitive relation in which an event implicates an entity—they are similar in nature to the so-called ‘light verb’ constructions” (p.47). The implication is that the null verb in unergatives can have a creation meaning like the overt verbs in (44), although this is not explicitly stated.

- (44) a. He is making bread.
b. She is making a toy.
c. They are making a hole.
d. She is producing a novel.

(Hale and Keyser, 1997b, p.47, their (28))

For Harley (1999, 2005) the underspecified null verb also acquires its meaning from the syntactic context. She cites three possible values that it can take: CAUS for change-

of-state verbs, DO for unergatives, and MAKE for verbs of birthing and bodily emission (*drool, cough*) As in Hale and Keyser's analysis, these are not different heads, but only paraphrases of a single verbal head in different contexts. Moreover, Harley proposes that in the birthing verbs like *foal*, the object is an incremental theme; she relies on this property of the object for a claim about the relationship between the boundedness of the nominal root and the telicity of the denominal verb (see Section 3.11). Thus Harley's analysis of birthing verbs, in which the null verb means MAKE and the object is an incremental theme, would appear to generate the infelicitous (43) (on the 'write books' reading) as well as the other infelicitous creation denominal verbs. In fact, the paraphrase 'make foal' for the verb *foal* seems somewhat less plausible than the paraphrase 'make book' for the infelicitous verb *#book*.

Since MAKE has no special status as a semantic primitive, but is only a paraphrase of the null verb's meaning in context, it does not seem there is anything in the theory to prohibit an alternate paraphrase such as CONSUME for the consumption and other incremental theme denominals. It might be possible, however, to require that the null verb have an overt light verb counterpart in English, in which case it could be argued that *make* is sufficiently light while *consume* is not, which would account for the infelicity of the consumption denominal verbs, but not the creation ones.

On the other hand, if we do not accept MAKE as a possible interpretation of the null verb but assume that in the intransitive cases the verb is always interpreted as a light verb DO, then we also expect the incremental theme denominals to be possible, as long as the nominal can be coerced to an event. Marantz (2005a) argues that nominals can be coerced to events to generate incremental theme readings, and assuming that is correct then it seems that 'do a book' ('read/write') or 'do an apple' ('eat') are on a parallel with 'do a hop', Harley's paraphrase for the unergative verb *hop*. There may ultimately be a way to characterize the null verb so that it allows for the derivation of *foal* and *drool* by incorporation but not *#apple* or *#book*, but it requires additional investigation.

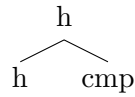
Another option would be a more restrictive characterization of the nominals that can occur as complements of the null verb, and this direction seems more promising. Hale and Keyser assimilate the unergative constructions in English to other cross-linguistic constructions, including a type of Basque unergative which consists of an overt light verb *egin* ‘do’ plus a nominal complement, e.g. *negar egin* ‘cry’, *jolas egin* ‘play’. Among the nominals that participate in this construction in Basque, however, food and drink nominals like *apple*, *beer* and artifacts like *book*, *symphony* are not found (Etxepare, 2003; de Rijk, 2008), suggesting that there may be a more restrictive notion of eventiveness for nominals involved in unergative formation in Basque, which could exclude the infelicitous English cases as well. I leave this for future work, however, and focus in the rest of the dissertation on the incorporation theory for English as it is generally construed in previous literature.

Another problem for the incorporation theory is that it fails to predict two classes of denominal verbs which I will show are attested: those that participate in transitivity alternations, and those with their own incremental themes. Considering Hale and Keyser’s theory with the amendments of Mateu (2001) and Harley (2005), let us look at the range of verb classes predicted for denominal verbs.

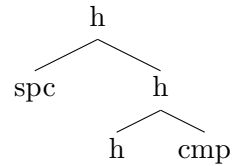
For Hale and Keyser there are four basic structural configurations possible in the sublexical syntax of words; see (45), repeated here from Section 2.5.1. Unergative denominals (*run*, *laugh*, *calve*, *sweat*) are formed directly from monadic type (a), where the nominal originates in complement position of the null verbal head. Change of state denominals (*saddle*, *water*) are formed by the merger of (a) with (b). The amendment of Mateu (2001) does not add any structural configurations, but refines the analysis of the pronoun in the (a)+(b) change of state denominals. The amendment of Harley (2005) does not add any structure configurations either, rather allowing the operation of manner incorporation to modify the head of the (a) configuration, leaving an overt object in complement position.

(45) Structural configurations

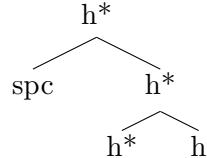
a. Verb (monadic)



b. Preposition (basic dyadic)



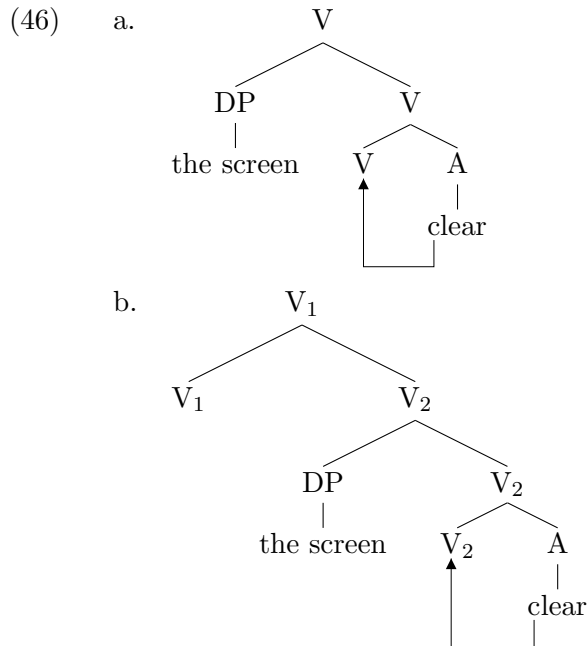
c. Adjective (complex dyadic)



d. Noun

h

The only verb type which exhibits a transitivity alternation in Hale and Keyser's typology is deadjectival verbs. These can be intransitive in their base form (46a), where (c) merges with the monadic verbal structure (a) and the adjective conflates with the null verb. Here the adjective fulfills its requirement for a specifier by the specifier of V. Alternatively the entire structure in (46a) can merge with an upper verb which supplies an external argument (46b). The situation for deadjectivals contrasts with the change of state denominal verbs, which do not have the intransitive option, because the PP structure (b) comes with its own specifier. This means that (b) yields a transitive when it merges with (a), and the PP cannot stand alone to yield an intransitive. Thus there is no mechanism for denominal verbs exhibiting transitivity alternations.



Such verbs are attested, however. Some examples are given in (47) through (49), and the existence of such verbs is further investigated in the corpus study in Chapter 4.

- (47) a. Belinda wheeled the trolley over and helped Faye by passing her the lancet and reading the reagent strip for her.
- b. One confident stride after another pushed him out across the ice until he wheeled sharply, shedding a spume of flakes at his feet.
(all from BNC)
- (48) a. Perhaps the best example of the company's penetration of both the Scottish and English markets is the fact that it was entrusted with printing the prospectuses for the Scottish Rugby Union's debenture and the English Rugby Union's Rose debenture.
- b. While it was printing two things happened.
(all from BNC)

- (49) a. Last November David Heath, Speywood's founder, announced that research, funded by the company at London's Royal Free Hospital and under the direction of Dr Edward Tuddenham, had isolated the elusive blood protein, factor VIII, that clots blood.
- b. First, the damaged tissues are sealed with tissue fluid and blood, which clots.
- (all from BNC)

Hale and Keyser's incorporation theory also does not predict denominal verbs with incremental themes of their own. Recall that the only transitive denominal verbs are ones where the surface object is underlyingly the specifier of an embedded PP. It is possible that such verbs could fall under the extension of Harley (2005), if manner incorporation occurs in structural configuration (a) and the direct object is taken as an incremental theme. However, Harley specifically invokes manner incorporation only for instrumental verbs, so more would need to be said on this matter, since the objects of instrumental verbs are not incremental themes. Such verbs are also attested; some examples are given in (50), and the existence of such verbs will be further confirmed in the corpus study in Chapter 4.

- (50) a. One afternoon they will be taken for an easy mountain ramble and on another they are taken by horse drawn carriage into the woods where they can barbecue sausages (a small charge is made for the barbecue).
- b. Now she smoked eighty cigarettes a day.
- c. Never one to turn down a freebie, Dave swigged the wine in five gulps...holding his left hand behind him, fingers crossed.
- (all from BNC)

3.3.3 The underspecification theories of Halle and Marantz (1993); Arad (2005); Borer (2005a,b)

The last theory of denominal verb formation which I will mention briefly is *underspecification*, the notion that roots are fully underspecified for grammatical category and all typing happens in the syntax (Halle and Marantz, 1993, 1994; Farrell, 2001; Barner and Bale, 2002, 2005; Borer, 2003, 2005a,b; Arad, 2003, 2005). Such a theory is particularly attractive for root-and-pattern languages like Hebrew, and also for English based on the high level of category flexibility that can be observed. One caveat is that complete underspecification does not seem to hold even for languages like Hebrew, where there are classes of roots that only surface in certain categories, e.g. those denoting concrete nouns like *cat* (Arad, 2005).

I believe that this general approach – merging a root directly into VP syntax – has the ability to deal with argument structure constraints on denominal verbs, although it has not previously been addressed in the literature.

3.4 Theoretical Framework

In this section I describe the framework that I use to present my proposal. It is situated within the family of theories that propose a division of labor between syntactic structure and category-free roots. A finite set of syntactic structures are responsible for semantic regularities across items, while the roots contribute idiosyncratic meaning. Borer (2003) refers to this approach as *exo-skeletal*, because the syntax forms the skeleton of meaning and the roots fill in the details (as opposed to *endo-skeletal*, where the lexical items project the syntactic structure). A feature of this approach is its parsimonious handling of polysemy, since a root can contribute a “core” of meaning which takes on different shades in different syntactic contexts. This approach also gives a natural account of coercion effects, e.g. from mass to count, or telic to atelic, in the presence of particular

functional structures.

Exo-skeletal approaches are relevant for every part of a sentence, but I am particularly interested in verbal argument projections. As Borer describes the approach, “syntactic structure gives rise to a template, or a series of templates, which, in turn, determine the interpretation of arguments”. Lexical items (roots) do not project argument structure but rather function as modifiers of the argument structure in the syntactic template. I also work within the family of theories that make an association between subevent and argument structure: specifically, events can be decomposed into subevents, and there is a relationship between subevents and argument structure, with some subevents and arguments introduced simultaneously (van Hout, 1992, 1996; Hale and Keyser, 1993; Tenny, 1994; Borer, 1994, 1998, 2005a,b; Kratzer, 1996, 2002; Marantz, 1996, 1997, 2005b, 2007; Harley, 1995; Ramchand, 2008). For my purposes, abstracting the argument structure away from the idiosyncratic root meaning will help to show that nominal and verbal roots can both modify argument structure templates in similar ways.

3.4.1 Semantically typed roots

In this section I consider the semantics of roots. In Distributed Morphology (Halle and Marantz, 1993, 1994) it is generally considered that roots are completely underspecified for grammatical category. However, some roots are strongly associated with one category or another, leading to extensions of the theory that can account for the licensing of roots in certain contexts (Harley and Noyer, 1999a,b, 2000). Marantz (2001) also states that there is semantic, if not syntactic, typing of roots: they refer to states (adjectival roots), events (verbal roots), or individuals (nominal roots).

For the sake of simplicity, I will assume that each root is associated with one or more semantic types. A root that is used only in nominal contexts has type $\langle e, t \rangle$ (predicate of individuals), while a root that is used only in verbal contexts has type $\langle s, t \rangle$ (predicate of events). However, the association with nominal or verbal contexts

is likely to be gradient rather than categorical; we have seen that English (as well as other languages) exhibits fairly high flexibility in the use of roots across categories, and Marantz (2001) points out that even strongly nominal roots can be coerced to event predicates given enough context (51).

(51) Meowing and scratching in imitation of his pet feline, Fred catted around the house for hours.

(Marantz, 2001)

I therefore assume that roots which are originally associated with only one type can be coerced to associate with another type, and that the second usage can increase in frequency until both types are fully established. For example, roots like $\sqrt{\text{hammer}}$ and $\sqrt{\text{stomach}}$ in English are well-established in both nominal and verbal environments. A root that can occur in either a nominal or a verbal environment is associated with two semantic types; this association may also be stored with probability information, although whether there are probabilities stored in the repository of idiosyncratic information is speculative and need not concern us here. An example (with pseudo-probabilities) is in (52).

(52) Example type associations:

$\sqrt{\text{stomach}}$	$\langle e, t \rangle$	0.50	$\langle s, t \rangle$	0.50
$\sqrt{\text{cat}}$	$\langle e, t \rangle$	0.99	$\langle s, t \rangle$	0.01
$\sqrt{\text{arrive}}$	$\langle e, t \rangle$	0.00	$\langle s, t \rangle$	1.00

We can think of roots like $\sqrt{\text{stomach}}$ as having an underspecified type, since they can be predicated of an individual or an event.⁵ A root like $\sqrt{\text{cat}}$ is also underspecified, although with a different probability distribution over types. I have not represented in (52) any information about the meaning of the root in different contexts, which must

⁵Although not completely *unspecified*; there seems less flexibility to convert nominal and verbal roots to adjectival uses in English, a fact for which I have no explanation.

also be stored in the repository. I have also not represented the fact that roots may be licensed with particular overt derivational morphemes; for example, $\sqrt{\text{arrive}}$ does not actually have zero probability of occurring in a nominal environment, since it would surface as *arrival*.

For simplicity, I refer to a root that is originally or predominantly used in nominal contexts as a “nominal root”, even if it has verbal uses as well, and a root that is originally or predominantly used in verbal contexts as a “verbal root”, even if it has nominal uses.

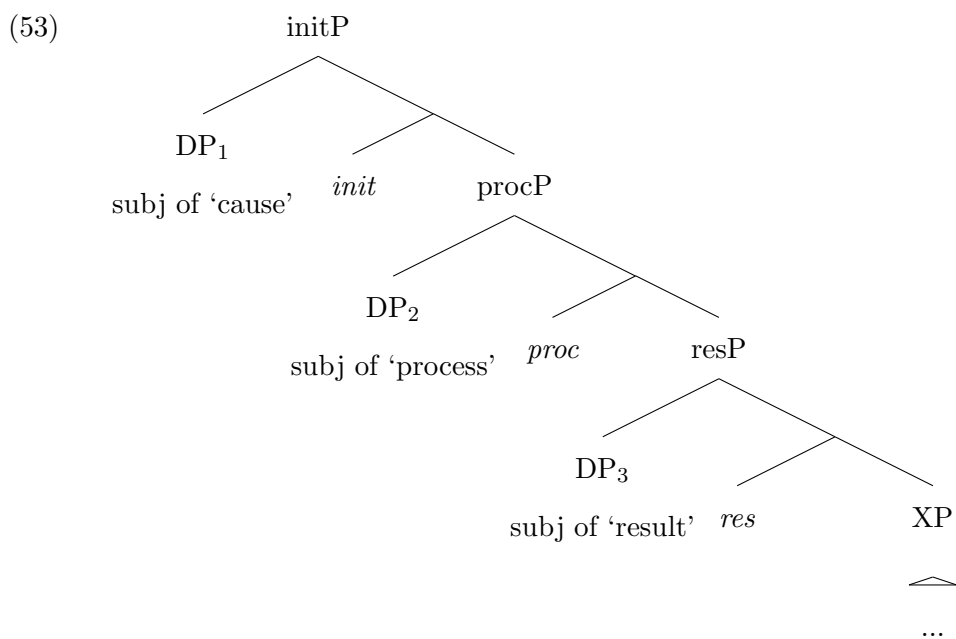
A root does not have to be introduced into a language with only a single type; it can be introduced as underspecified or completely unspecified for category, and most Hebrew roots are presumed to be of this type; anecdotally, some relatively new English items such as *Google* and *blog* also seem to have entered the language as nouns and verbs almost simultaneously.

3.4.2 Event decomposition in syntax: The Ramchand skeleton

I present my proposal using the First Phase Syntax of Ramchand (2008) as the exoskeletal syntactic structure. Let me note that Ramchand adopts a variant of incorporation for denominal verbs within her system (p.91-99), but I do not; I adopt her general approach for verbal roots to nominal roots instead. Ramchand’s framework provides a straightforward event decomposition syntax, along with a mapping between syntactic structure and a small set of verb classes, which represent major argument/event structure classes at a level of granularity appropriate for the corpus study in Chapter 4. My major points are not tied to Ramchand’s framework, however. Here I give a brief summary of the first phase syntax; for details see Ramchand (2008).

The event decomposition in Ramchand’s VP contains three projections: *initP*, *procP*, and *resP*. *ProcP* is obligatory and represents ‘process’, or dynamicity; all verbs except statives have *procP*. Verbs may also optionally have one or both of *initP* and *resP*. *InitP*

represents initiation, or cause; it introduces the external argument, equivalent to vP or voiceP in other systems. The initiator need not be animate or volitional. ResP represents a result, which Ramchand equates to telicity. ResP can either be instantiated by the verb, in which case it is the inherent endpoint of a lexically telic verb, or it can be instantiated by a particle or resultative phrase. Both *initP* and *resP* are considered to represent states, and it is their juxtaposition with *procP* which accounts for their interpretation as cause or result, respectively, i.e. there is no overt causative head. The full functional sequence is shown in (53).



Functional sequence for event decomposition in Ramchand (2008).

The first phase syntax is built up by Merge. Verbal roots carry one or more features representing *init*, *proc*, and *res*, indicating where they can merge within the functional sequence. Verbal roots are also allowed to Rmerge (Starke, 2001), which allows the root to multiply associate with the different heads in the functional sequence. Ramchand assumes that the highest ‘copy’ or merge position is the one pronounced (p59, note 6).

Arguments are merged in the specifiers of the three subevent heads. The specifier of

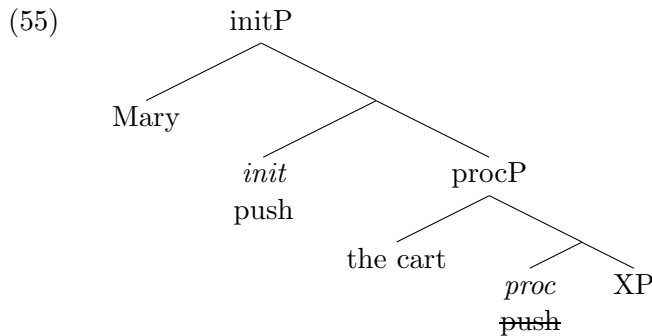
procP is the *undergoer (of process)*. The specifier of *initP* is interpreted as the *initiator*, and the specifier of *resP* is interpreted as the *resultee*, or holder of the result state. As with verb roots, DPs are allowed to multiply associate with these positions, so that e.g. in the sentence *Mary broke the stick*, the stick is both the undergoer of the breaking process and the holder of the ‘broken’ result state. Ramchand refers to this as a “composite participant relation”.

I will follow Ramchand’s notation in using *v* (“little *v*”) for initiator, *V* for process, and *R* for result. Subscripts are used for coindexation in the case of composite participant relations, so for example, vV_iR_i indicates a verb with *init* (*v*), *proc* (*V*), and *res* (*R*) components, where the undergoer of process and result are co-indexed, i.e. they are the same participant. The idiosyncratic information stored with each verb root thus consists of, first, which heads it can/must instantiate; and, second, whether the specifier positions of the subeventual heads must be filled by different DPs or whether the arguments can multiply associate.

A neo-Davidsonian event semantic representation (Parsons, 1990) is used for the semantics that can be read off the subeventual structure. The semantics for the full functional sequence in (53) is given in (54), adapted from Ramchand (2008, p.42-45). The arrow \rightarrow represents causation, which is the relationship assumed to hold between subevents (initiation state, if any, causes the process; process causes the result state, if any). When any of the subeventual heads are not present, the corresponding subevents will not be present in the semantics. PRED stands for the verbal root, interpreted as a predicate of events; note that it is predicated of all three subevents, since all are part of the described event (e.g. if the verb is *defuse*, then the process is a defusing process, the initiation begins the defusing, and the result is the result of the defusing). For convenience, I use the notation $x = \text{DP}$ to indicate the interpretation of the specifiers, though all DPs in specifier position should be interpreted as full generalized quantifiers.

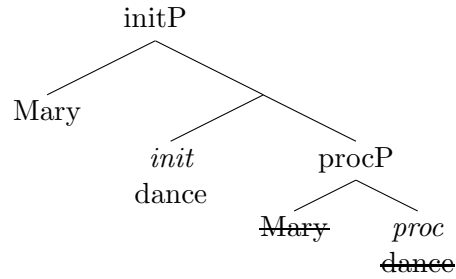
- (54) $\lambda x \lambda y \lambda z \lambda e \exists e_1, e_2, e_3 [\text{State}(e_1) \ \& \ \text{Process}(e_2) \ \& \ \text{State}(e_3)$
 $\& \ e = e_1 \rightarrow e_2 \rightarrow e_3$
 $\& \ \text{PRED}(e_1) \ \& \ \text{PRED}(e_2) \ \& \ \text{PRED}(e_3)$
 $\& \ \text{Subj}(e_1, x) \ \& \ \text{Subj}(e_2, y) \ \& \ \text{Subj}(e_3, z)$
 $\& \ x = \text{DP}_1 \ \& \ y = \text{DP}_2 \ \& \ z = \text{DP}_3]$

Sample derivations for seven major verb classes are shown in (55) through (61). For example, transitive activity verbs (55) have both an initiation and a process component. Verbs that participate in the causative-inchoative alternation (60), (61) are considered to have no inherent initiation component, so that the initiator can either be supplied as an external argument, or be filled by a copy of the internal argument. I follow Ramchand's notation in that multiple copies of the words indicate multiple merge, with the strikeouts indicating unpronounced copies.



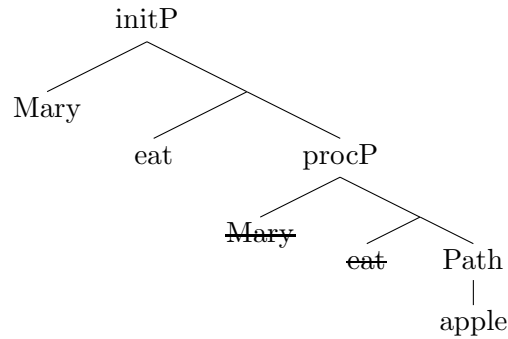
Ramchand analysis of transitive activity: *Mary pushed the cart*. This verb has an initiator (subject of *initP*) and an undergoer (subject of *procP*) which are not co-indexed.

(56)



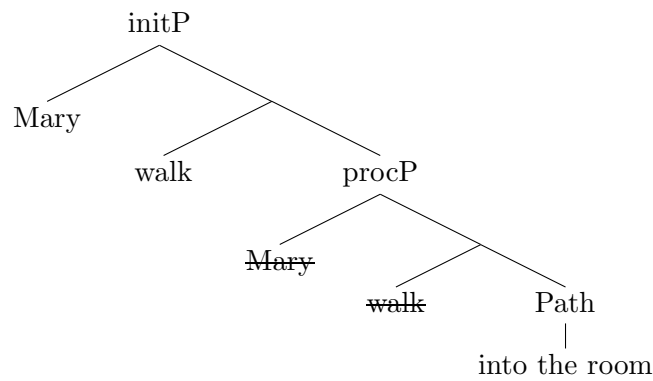
Ramchand analysis of intransitive activity (unergative): *Mary danced*. The subjects of *initP* and *procP* are coindexed, i.e. *Mary* is both the initiator and undergoer.

(57)



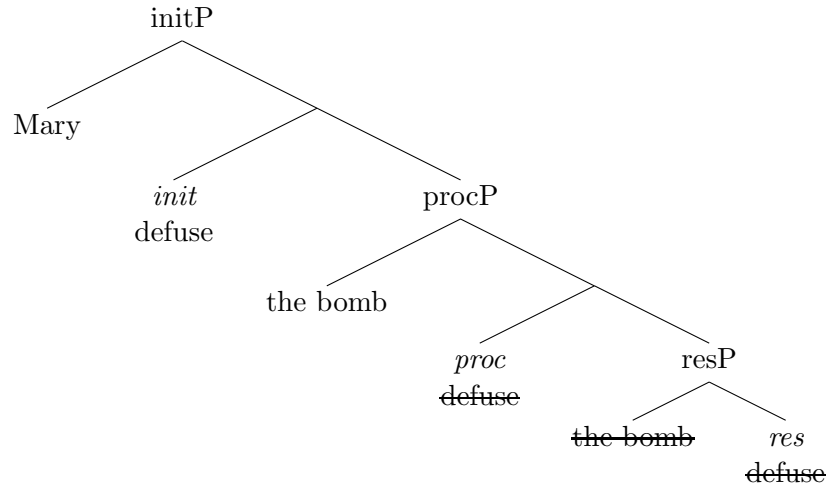
Ramchand analysis of accomplishment: *Mary ate an apple*. The initiator and undergoer are co-indexed. The surface object, an incremental theme, is in Path position.

(58)



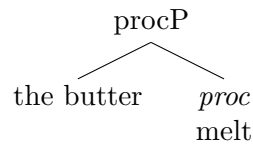
Ramchand analysis of path PP: *Mary walked into the room*. This example is similar to the incremental theme example except that the Path is not a DP but a PP.

(59)



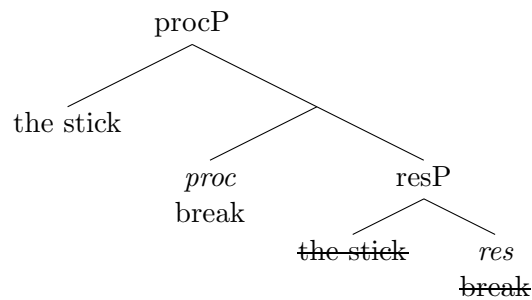
Ramchand analysis of achievement verbs: *Mary defused the bomb*. The undergoer and resultee (subject of *resP*) are co-indexed, so *the bomb* is both the undergoer and the holder of the result state.

(60)



Ramchand analysis of alternating atelic verbs: *the butter melted*. There is no initiator encoded for this verb. However an *initP* is required to satisfy the EPP, so either an external argument is inserted, resulting in a transitive, or the subject of *procP* moves to *initP*, resulting in an intransitive.

(61)



Ramchand analysis of alternating telic verbs: *the stick broke*. This example is identical to the alternating atelic verb, except for the presence of *resP*.

In the case of accomplishment verbs, e.g. creation/consumption verbs, Ramchand proposes that the direct object, which is the incremental theme, is not the undergoer of process, but rather a Path in the complement of *proc*. The analysis is in (57). Path PPs with unergatives are in the same position; see (58). Note that in accomplishment verbs, the surface subject is both the initiator and the undergoer of process.

A feature of Ramchand's framework is that telicity can be arrived at in multiple ways. The existence of a path object or path PP can create telicity (though it will not do so with an unbounded path like *around the room*). Telicity can also arise from the presence of a result head.

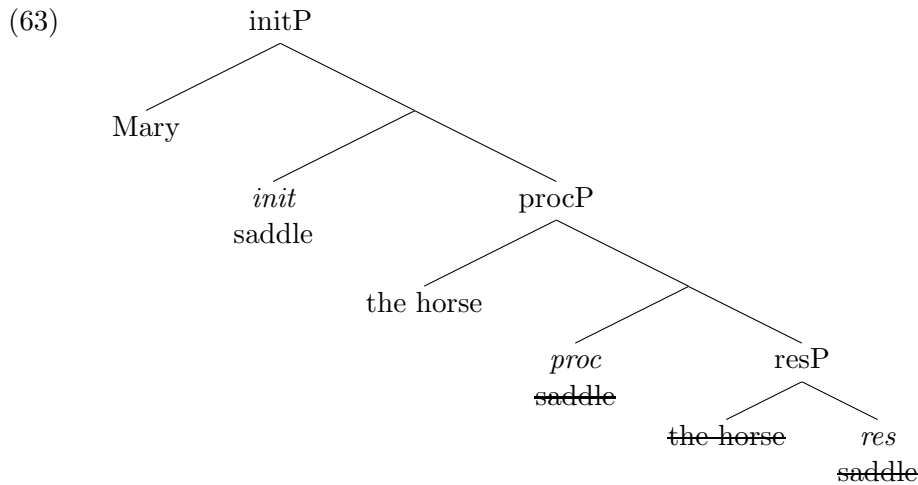
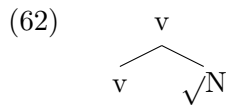
3.5 Proposal

I make the following proposal regarding denominal verbs:

- The nominal element in English denominal verbs is a nominal root (not a noun), as discussed in Section 3.2.1.
- Denominal verb formation in English takes place via lexical subordination, equivalent to manner incorporation in the sense of Harley (2005), i.e. the merger of a nominal root directly with a verbal syntactic skeleton.
- The nominal root modifies the verbal heads directly and does not originate in an argument position. In Ramchand's framework, it never occupies a specifier position at any stage of the derivation. Locally, then, all conversion looks like (62), where little *v* represents either the *init* (*v*), *proc* (*V*), or *res* (*R*) head in Ramchand's event decomposition syntax.⁶
- Like verbal roots, nominal roots can multiply merge with the subeventual heads in the VP. For example, a transitive change-of-state verb looks like (63).

⁶Note that in subsequent trees I follow Ramchand's convention of omitting the adjunction and placing the name of the root below the head.

- When a novel denominal coinage is made, the speaker and hearer have the freedom to associate the root with any argument and subeventual structure, although the choice will be constrained by the meaning of the root, world knowledge, and analogy with lexicalized denominal verbs. I also assume that verbs formed with nominal roots may eventually become lexicalized, i.e. their subeventual structure and argument coindexation listed in the repository of idiosyncratic information.
- The nominal root is interpreted as an event predicate.



Proposal for transitive change of state verbs: *Mary saddled the horse*. This is identical to the Ramchand analysis for *defuse*, except that the root happens to be nominal.

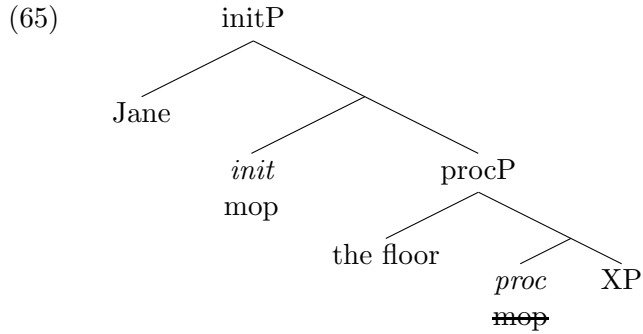
I represent the semantics of the denominal verb with the same neo-Davidsonian representation used for verbs from verbal roots, with the nominal root contributing the event predicate and the syntax contributing the event structure; see Section 3.6 for a discussion of what it means for a nominal root to be construed as an event predicate.

For the syntax in (63) we have the semantics in (64).

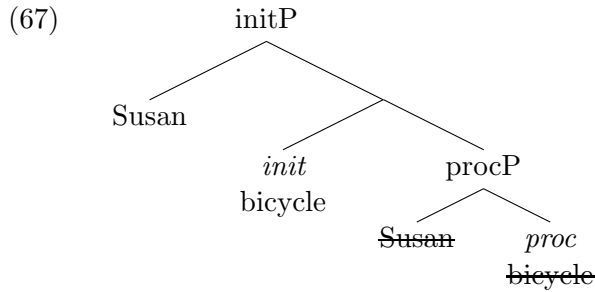
- (64) Mary saddled the horse.
 $\lambda x \lambda y \lambda z \lambda e \exists e_1, e_2, e_3 [\text{State}(e_1) \ \& \ \text{Process}(e_2) \ \& \ \text{State}(e_3)$
 $\ \& \ e = e_1 \rightarrow e_2 \rightarrow e_3$
 $\ \& \ \text{saddle}(e_1) \ \& \ \text{saddle}(e_2) \ \& \ \text{saddle}(e_3) \ \&$
 $\ \text{Subj}(e_1, x) \ \& \ \text{Subj}(e_2, y) \ \& \ \text{Subj}(e_3, z) \ \&$
 $\ \text{Mary}(x) \ \& \ \text{horse}(y) \ \& \ \text{horse}(z)]$

The syntax in (63) and semantics in (64) are representative of my proposals for all change of state denominal verbs, including location (*cage the tiger*), locatum (*saddle the horse*), and goal (*powder the aspirin*) verbs. Note that I am explicitly claiming there is no prepositional component to location/locatum verbs, as in incorporation theories. Rather, they follow the general template for result-state verbs, with *init*, *proc*, and *res* heads. I follow Mateu (2001) in taking the position that these three semantic classes of denominal verbs are identical in terms of their syntax and event semantics. The components of meaning that divide them into subclasses, i.e. whether they can be paraphrased as ‘put OBJ into N’, ‘put N onto OBJ’, or ‘turn OBJ into N’ are epiphenomenal and arise from pragmatics and the idiosyncratic meaning of the nominal roots themselves.

My proposed syntax and semantics for transitive instrumental denominal verbs are in (65) and (66), and for intransitives in (67) and (68). They follow the general templates for transitive and intransitive activity verbs, respectively. Recall that for the intransitive, the subjects of *initP* and *procP* are coindexed, i.e. the initiator and subject of process are the same individual.



(66) Jane mopped the floor.
 $\lambda x \lambda y \lambda e \exists e_1, e_2 [\text{State}(e_1) \ \& \ \text{Process}(e_2) \ \& \ \text{mop}(e_1) \ \& \ \text{mop}(e_2)$
 $\ \& \ \text{Subj}(e_1, x) \ \& \ \text{Subj}(e_2, y) \ \& \ \text{Jane}(x) \ \& \ \text{floor}(y) \ \& \ e = e_1 \rightarrow e_2]$



(68) Susan bicycled.
 $\lambda x \lambda y \lambda e \exists e_1, e_2 [\text{State}(e_1) \ \& \ \text{Process}(e_2) \ \& \ \text{bicycle}(e_1) \ \& \ \text{bicycle}(e_2)$
 $\ \& \ \text{Subj}(e_1, x) \ \& \ \text{Subj}(e_2, y) \ \& \ \text{Susan}(x) \ \& \ \text{Susan}(y) \ \& \ e = e_1 \rightarrow e_2]$

One consequence of using the Ramchand skeleton for interpretation of denominal verbs is that they must be interpreted in accordance with their observed argument structure. The syntax and semantics are in direct correspondence: an argument is part of the event if and only if there is a DP in argument position. For example, encountering an intransitive denominal verb, hearers have the option of interpreting it as an activity, an

intransitive achievement, or even an unaccusative – in short, as any syntactic structure that is surface-intransitive (though presumably the unaccusative is somewhat marked). The hearer does not have the option of interpreting the verb as one with an undergoer, because the surface syntax does not allow for it. Telicity, i.e. the inferred presence of *resP* in the absence of an overt marker such as a particle, must be part of the negotiation between speaker and hearer.

There is strong psycholinguistic support for the role of argument structure in interpreting a verb. Experiments with children (e.g. Pinker et al., 1987; Gropen et al., 1991; Naigles, 1990; Fisher, 1996) show that there is a strong association between form and meaning, and that children use syntactic form to interpret meaning on the fly. The form-meaning association likely plays a role in children’s language acquisition (Gleitman and Gillette, 1995; Naigles et al., 1992; Pinker, 1989). There is also evidence that adults use syntactic information to generalize to new verbs in familiar constructions (Fisher, 1994; Naigles and Terrazas, 1998; Kaschak and Glenberg, 2000, 2004; Kaschak, 2006; Kako, 2006; Goldwater and Markman, 2009). There is no consensus in the literature regarding the mechanism for this effect, which could be due to linking rules, analogy, or argument structure constructions that carry their own meanings (Goldberg, 1995). I take no position on this question; the crucial point is that the mechanism exists for established and novel verbs from verbal roots, and I assume the same mechanism comes into play for nominal roots used in verbal environments, especially when the denominal verb is novel.

Like the semantic proposal of Clark and Clark (1979) (see Section 3.3.1), my proposal ensures that the observed arguments are interpreted according to their observed positions. It differs, however, in not allowing the source nominal itself to take an argument role. Effectively, Clark and Clark (1979) allow the surface argument structure of the denominal verb to be augmented to make room for the source nominal as an argument, while I do not.

3.6 Event Predicates

In this section I discuss what it means for a nominal root to be interpreted as a predicate of events. Native speakers of English already have an intuitive knowledge of what this means for well-established denominal verbs. For example, we know that the word *saddle* denotes both individual saddles and “saddling events” – events of putting a saddle on something. For an innovative denominal verb that is novel to the hearer, there must be a process of coercion, or sense extension, which coerces a root of type $\langle e, t \rangle$ to type $\langle s, t \rangle$ and allows the hearer to interpret the root as denoting a set of events. The particular set of events denoted depends on context, sentential syntax, and the mutual knowledge of the interlocutors.

Informally, the use of a nominal root in a verbal environment tells the hearer nothing more and nothing less than that the nominal root is being used to pick out a set of events, and that the events in the set must be consistent with the argument and event structure of the denominal verb in the utterance. To put it another way, the nominal root must be construed as contributing the idiosyncratic material – we could also say the manner – which adds meaning to the argument and event structure by a process of lexical subordination. In Clark and Clark’s *teapot* example, the hearer is able to identify a set of “teapotting” events based on the speaker and hearer’s mutual knowledge of their friend Max’s strange habit; moreover, because the verb has a subject and a direct object – *Max tried to teapot a policeman* – the event must have two arguments, one of which is an agent or cause, and the other of which is a patient, theme, or resultee. The nominal root itself cannot be assumed to name a participant in the event, as there are many cases where there is no such participant (69); see also Section 5.4.

- (69) a. People who wanted information from him were noting his silence and making their judgments accordingly; his life seemed to be funnelling down into a pit like so much waste water, and yet he couldn’t stir himself to the right

kind of action.

- b. Lee Doherty set up Johnston for a right-wing cross and Gorman ghosted between two Bangor defenders to keep up his record of scoring in every round.
- c. Burton's reputation as a drinker is deceitfully challenged by some idiot who spikes his beer with wood alcohol: he crashes down a flight of stairs and hurts his back.
- d. The Dons cranked up the ghetto-blaster and happily rubbed United's noses in their demoralising defeat with an impromptu dressing room bash, capped by the bizarre sight of naked backsides wiggling in the sombre Old Trafford corridors.

(all from BNC)

This view of denominal verb meaning is in line with the notion of “contextuals” (Clark and Clark, 1979; Aronoff, 1980), items that depend on context for their meaning. The difference in my approach is the interaction with argument structure: the nominal root does not introduce any event participants, arguments or otherwise. If it appears to introduce an event participant, it is only by implication; see Section 5.4.3.

More formally, by an event predicate I mean a particular type of predicate within (neo-)Davidsonian event semantics. Both Davidsonian and neo-Davidsonian event semantics have, for any given sentence (assuming for simplicity that it is monoclausal), a special predicate which “names” the event the sentence picks out. This is sometimes called the “main predicate”, or the “predicate contributed by the verb”. As an example, consider the sentence *Mary kissed Susan in the morning* (70). Abstracting away from subeventual structure, the Davidsonian (Davidson, 1967) event representation is given in (70a), and the neo-Davidsonian (Parsons, 1990) representations in (70b). The predicate that names the event in both representations is *kiss*.

There are a variety of differences between the neo-Davidsonian and Davidsonian rep-

representations, one being the linking of verbal arguments to the event variable by thematic role relations (agent and patient in (70b)), rather than grouping the verbal arguments together with the event variable as arguments of the event predicate (*Mary* and *Susan* as arguments of *kiss* in (70a)). This has the effect of leveling the argument-adjunct distinction, since *Mary*, *Susan*, and *morning* all have the same formal status in (70b). There are good reasons for leveling this distinction and introducing at least some arguments with linking predicates rather than as arguments of the event predicate (Kratzer, 2002); I will not address them here, but will assume the neo-Davidsonian representation.

- (70) Mary kissed Susan in the morning.
- a. $\exists e.kiss(e, Mary, Susan) \ \& \ in(e, morning)$
 - b. $\exists e.kiss(e) \ \& \ agent(e, Mary) \ \& \ patient(e, Susan) \ \& \ in(e, morning)$

Based on (70), we can say that the event predicate is the only one-place predicate of the event variable. In Davidsonian semantics, the equivalent would be the unique predicate whose arguments include the event variable along with the verbal arguments.

A potential complication with this definition of the event predicate is that in the simplest form of neo-Davidsonian event semantics, (manner) adverbs are also represented as one-place predicates of the event variable (71), yet are not the main event predicate.

- (71) Mary kissed Susan quickly in the morning.
- a. $\exists e.kiss(e) \ \& \ agent(e, Mary) \ \& \ patient(e, Susan) \ \& \ in(e, morning) \ \& \ quick(e)$

This need not be a major complication since there is no consensus that (71) is the correct way to represent manner adverbs. Parsons (1990) introduced a second argument of adverbs, which is a contextual parameter representing a comparison class, to account for examples like (72).

- (72) a. Mary ran quickly. [in comparison to her friends]
 b. Mary ran slowly. [in comparison to professional runners]
 $\exists e.\text{running}(e) \ \& \ \text{agent}(e, \text{Mary}) \ \& \ \text{slow}(e, C_{\text{Mary's friends}})$

More recently, Schäfer (2008) and Piñón (2007) have re-examined manner adverbs in light of scope interactions like those in (73a). For example, Piñón’s analysis is in (73b), where adverbs are predicates of manners, in this case a “form” manner which represents the trajectory of motion in the writing event, and an “effort” manner which exists for all agentive verbs. Manners themselves are represented here as predicates of event types. The particular details of the proposals are not important; the point is that there is reason to believe that adverbs are not one-place predicates of event variables, and therefore we can still define the event predicate as the unique one-place predicate of the event variable in neo-Davidsonian event representations. I also note that adverbs are optional, so that the event predicate can also be identified as the only obligatory one-place predicate in the semantic representation of a sentence.

- (73) a. Rebecca painstakingly wrote illegibly. \nrightarrow Rebecca wrote painstakingly.
 b. $\lambda e.\text{write}(e) \ \& \ \text{agent}(e, \text{Rebecca}) \ \& \ \text{illegible}(\text{form}(\lambda e'.\text{write}(e'))(e)) \ \& \ \text{painstaking}(\text{effort}(\lambda e'.\text{write}(e') \ \& \ \text{illegible}(\text{form}(\lambda e''.\text{write}(e''))(e')))(e))$

The event predicate contributes idiosyncratic information to the meaning of the sentence, as opposed to thematic relations like agent and patient, other relations like prepositional adjuncts, and subevents like initiation, process, and result (which for simplicity I did not represent in (70), but which can be seen in the semantic representations of Section 3.5). All of these other elements can be found in common across a wide range of sentences, and are not idiosyncratic. The idiosyncratic information is sometimes referred to as a “manner component”, since it contributes information about how the dynamic process part of the event (and sometimes the initiation and result) takes place, though we must be careful to distinguish this notion of manner from the case of manner adverbs.

When a nominal root is used as an event predicate it is, like verbal roots, subordinate to the argument structure of the sentence, i.e. its sense must be consistent with the observed argument structure. Thus *thread* assumes different senses in a transitive frame (74a) and an X's way frame (74b).

- (74) a. (That was the last time she threaded a needle.)
b. Moving away from the driveway they threaded their way through the trees, until they reached the fringe of the woods where they bordered onto the wide expanse of neatly mown lawns, dotted here and there with beds of flowers and shrubbery.
(all from BNC)

As a final suggestion about the intuition of what it means for a nominal root to be an event predicate, I note that it is easy to assume a verb like *saddle* denotes 'those events having to do with one or more saddles'. However, as we have seen in examples like (69), and as I will discuss further in Section 5.4, there is no guarantee that an individual saddle will be a participant in a saddling event. Rather, let us say that that the denominal verb *saddle*, of type $\langle s, t \rangle$, denotes 'those events that have the property of saddle-ness'. The hearer might infer that a saddle is involved, or the property might apply to the subparts of the event itself, such as the manner of the dynamic process, and the initiation and/or result if present. The noun *saddle*, on the other hand, is of type $\langle e, t \rangle$ and denotes 'those individuals that have the property of saddle-ness', i.e. (individual) saddles.

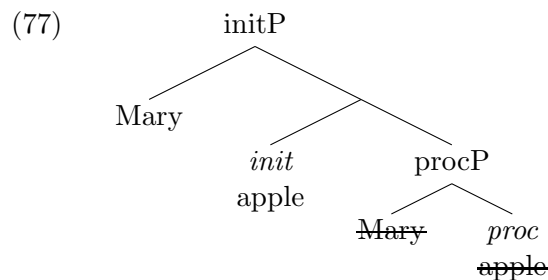
We can compare the manner of motion verb *ghost* in (75) with the instrument verb *crayon* in (76).

- (75) Lee Doherty set up Johnston for a right-wing cross and Gorman ghosted between two Bangor defenders to keep up his record of scoring in every round. [BNC]
(76) Oh he's been crayoning OK. [BNC]

In (75) we can say that there is an event having the property of ghost-ness, which in this case tells us something about the subject's manner of motion. In (76), on the other hand, we can say that there is an event having the property of crayon-ness, which in this case is understood as implying the involvement of an actual crayon. The definition of the event predicate covers both interpretations. In addition, both interpretations are consistent with the intransitive argument structure of the denominal verbs in (75) and (76).

3.7 Application of Proposal

This proposal accounts for the intransitive theme/patient/resultee constraint in the following way. The putative denominal verbs *apple*, *book*, *beer*, etc. are surface intransitives. A hearer would have the option of interpreting them as atelic, analogous to verbs like *dance*, or punctual, analogous to verbs like *slump*. If *apple* were interpreted analogously to *dance*, its syntax and semantics would be as in (77) and (78). Note that with the nominal root interpreted as an event predicate, it has no chance to be interpreted as an incremental theme, since incremental themes arise in the complement of *proc* in Ramchand's system. Nor can it be interpreted as a patient, since patients arise in the specifier of *procP*. If the verb were interpreted punctually, there would be a *resP* but the problem would be the same. In fact, this is not only a property of Ramchand's system but can be considered a general principle that a root must occur in argument position to be interpreted as an argument.



- (78) $\lambda x \lambda y \lambda e \exists e_1, e_2 [\text{apple}(e_1) \ \& \ \text{State}(e_1) \ \& \ \text{Subj}(e_1, y)$
 $\ \& \ \text{apple}(e_2) \ \& \ \text{Process}(e_2) \ \& \ \text{Subj}(e_2, x)$
 $\ \& \ e = e_1 \rightarrow e_2$
 $\ \& \ \text{Mary}(x) \ \& \ x = y]$

We can compare this situation with that of complement coercion (e.g. *begin the book*). Pytkäinen and McElree (2006) argue that complement coercion does not involve a null verb, but rather a process of enhanced composition in which the object noun is coerced to an event reading. Crucially, in complement coercion the nominal originates in a direct object position. I suggest that this allows the interpretation of an event where the noun is a theme, while in conversion to a verb the nominal is strictly an event predicate. The complement coercion facts are consistent with the proposal of Marantz (2005a) that direct object DPs can be interpreted as events, and provide further support for the proposal that the nominal in conversion verbs is never a direct object.

My proposal allows for various types of flexibility in how nominal roots are used as verbs. Kiparsky (1997) noted that a single root could give rise to multiple interpretations, even apparently “opposite” ones, if they were all pragmatically acceptable (79).

- (79) a. ice the drink (locatum), ice the meat (location)
 b. index the book (locatum), index the material (location)
 c. thread the needle (locatum), thread the pearls (location)
 d. powder one’s face (locatum), powder the aspirin (goal)
 (a-c from Kiparsky (1997))

Under my approach each pair has the same syntax and event structure, but has two senses because two different change of state meanings are pragmatically acceptable.

It is also the case, though, that a single root can be lexicalized with more than one argument structure, or used in innovative ways. The familiar change of state verbs like *saddle* have been lexicalized as transitives. But consider (80), in which two denominal

verbs which the OED lists as strictly transitive (and which are, in my intuition, almost exclusively transitive as well), are used innovatively as intransitives. This phenomenon can be easily accommodated under my approach, by associating the nominal root with a different event and argument structure on an ad hoc basis.

- (80) a. It wasn't so much that I changed who I was – I didn't know who I was, I just knew that I felt more secure, socially, when I costumed, and that my parents thought that my costuming hid the real me, which was partly right, although also partly not right. [WWW, comment on a blog post about a shy teenager adopting a variety of clothing styles]
- b. I frowned at the screen and muttered under my breath as I zoomed and windowed and scowled. [WWW]

Finally, recall that in Ramchand's system, every verb has, at minimum, a process component, so the nominal root is interpreted, at minimum, as a predicate of a process subevent, with an optional initiation and result subevent. This provides a natural account of the observation of both Hale and Keyser and Kiparsky (1997) that e.g. *saddle* does not only mean 'cause a saddle to be on', but is typically done in a particular way (not putting it on backwards, for example, or dropping it from a great height). Hale and Keyser introduce a notion of an "adverbial increment" which is added to the verb for this purpose, but, as Kiparsky notes, the mechanism is awkward. Treating the nominal root as an event predicate which can contribute idiosyncratic meaning to the interpretation of the subeventual heads gives us this effect for free.

3.8 Prediction on Productivity of Conversion Across Argument and Event Structure Classes

In addition to accounting for the gap in intransitive readings, my proposal makes an additional prediction: that denominal verbs can occur in all the same verb classes as verbs formed from verbal roots. If nominal roots can be merged directly in event-decomposition VP structures, then there should be no absolute prohibitions on the verb frames in which denominal verbs can surface. There may, however, be biases in lexicalization.

This prediction is tested in a corpus study in Chapter 4. We will see that denominal verbs can surface in all the frames that verbs from verbal roots can surface in, with the possible exception of statives. Denominal verbs are significantly more likely to be transitive, however, both in terms of type frequency and token frequency. We will also see that denominal verbs appear in additional classes, including frames containing clausal complements (e.g. *vote*), and frames with their own incremental theme (e.g. *barbecue*). They can also participate in transitivity alternations, which is not predicted by the incorporation theory of denominal verbs.

In the context of this prediction, let us briefly compare the notion of lexical subordination or *manner incorporation* for denominal verbs with Talmy's notion of *manner conflation* for motion verbs (Talmy, 1985, 2000), in order to make a cross-linguistic prediction. Talmy proposed that there are two kinds of languages: event-framed (or, in earlier work, path-framed) languages like English, which express path in the syntax and incorporate manner of motion into the verb (*the bottle floated into the cave*); and satellite-framed languages, which express manner syntactically as an adverb and incorporate path (result) into the verb. For Talmy, this was essentially a question of lexicalization patterns: which kinds of roots can be, or tend to be, lexicalized as verbs in a given language. In more recent literature the lexicalization of manner of motion verbs has been thought of as a special case of a general process of lexical subordination (Levin and Rapoport, 1988;

Jackendoff, 1998; McIntyre, 2004; Mateu, 2002, 2008; Borer, 2005a,b; Ramchand, 2008; den Dikken, 2010) which is not limited to manner of motion constructions. Mateu and Rigau (2002) have assimilated the encoding of manner to a morphological operation of conflation, and proposed that a parameter determines which languages have this process available, e.g. English does and Romance does not. However, the state of affairs is now known to be more complicated than Talmy’s dichotomy would imply. It is believed that there is no single parameter, but rather different languages exhibiting different framing tendencies depending on multiple factors such as available prepositions, verb serialization capabilities, and compounding possibilities (Beavers et al., 2010). This means that a language might exhibit manner conflation in one construction but not another, with the “satellite-framed” languages being ones that lack the prepositions and other options for constructions in which manner conflation would otherwise occur.

Since I have proposed that English denominal verb formation takes place via lexical subordination, then if we generalize this to other languages, I make the prediction that the same possibilities available for manner conflation of verbal roots in any language are also available for denominal verbs. This seems to be borne out in the case of Romance. For example, resultative adjectives are not available for verbs from verbal roots in Spanish (81), and equally unavailable for denominal verbs (82).

- (81) **John golpeó la carne plana*
 John pounded the meat flat
 ‘John pounded the meat flat’

(Son and Svenonius, 2008)

- (82) **María martilleó el metal plano*
 María hammered the metal flat
 ‘María hammered the metal flat’

(Mateu, to appear)

3.9 The “Miscellaneous” Class

Recall from Section 2.4 the large size of the “miscellaneous” class of denominal verbs, those that do not fit easily into semantic categories such as location, locatum, or instrument. For Clark and Clark (1979), this class was larger than some of the more specific classes. One important advantage of my approach to denominal verb formation is the ease with which it accounts for the miscellaneous classes. I advocate an output-oriented classification of denominal verbs according to standard verb classes, e.g. causative change of state verbs, activity verbs, etc. The semantic denominal verb classes are then subregularities within major verb classes, for example the change of state verbs include clusters of location, locatum, and goal verbs, but verbs that do not fit easily into these clusters are not left uncategorized. This contrasts with the incorporation theory, where any change of state verb whose meaning does not correspond to an embedded PP structure is difficult if not impossible to account for.

3.10 Interpretation of Intransitive Denominal Verbs

We have seen a number of constraints on the interpretation of intransitive denominal verbs, when the source nominal is an undergoer, theme, resultee, or initiator, but on the other hand we know that intransitive denominal verbs are attested. In this section I consider how intransitive denominal verbs can be interpreted, if the source nominal does not originate in an argument position. I first look at examples of intransitive denominal verbs from the corpus study in Chapter 4, and then at apparent exceptions to the theme constraint.

3.10.1 Attested intransitive denominal verbs

Table 3.1 shows the set of denominal verbs that occurred in at least one intransitive sentence, from among the 250 denominal verbs in the corpus study in Chapter 4. The

Telic ($v_i V_i R_i$)	bark bill blossom bolt book buck castle chance chart claw climax cloud drum flag fork funnel gel goof grass hiccup land mass mesh peal pearl pit pump score shampoo sign stale surge swig triumph trump twig vote wall whelp
Atelic ($v_i V_i$)	augur balk band barbecue bark beam blazon bludgeon bone book bottle brake branch bridge brush buck bud bulk bull bum chance charm chorus chum claw clip clock clot club coal cox crank crayon dice dose dredge drum farm feud flag flake foam foot force freight frowst funnel gear ghost gloss golf guard ha- rangue hare heel hiccup hoard home hose hymn lace lasso leaf lime mass mate mess milk mill model mop motor nose panic parade parrot peak peal pet pipe plough pole price print pump queue race rage sand scull seam sex shade shoal side skate slave sluice slum smoke soldier spar spear spike spoon sport spur steam surge swan swig switch tag test thatch thread tile trench trump tug umpire waltz whale whang wrench

Table 3.1: Denominal verbs from corpus study with at least one intransitive example.

meanings of the verbs in Table 3.1 are highly varied, and I do not attempt to classify all of them. However, I will point out some salient subclasses, giving representative examples from the annotated corpus data.

Some of the verbs are inchoatives or atelic change-of-state verbs, in which the nominal root describes the end state of the change undergone by the subject of the sentence (83). Others are manner of motion verbs, in which the nominal root describes the manner in which the subject moves (84). There are profession verbs (85) and animal verbs (86), both of which are very similar to the manner of motion verbs in that the nominal root describes something about the manner in which the subject of the sentence behaves. In fact, some of the animal verbs are also manner of motion verbs. There are also verbs in which the nominal root is an instrument, where the sentence has an understood object (87). In none of these cases does the nominal root plausibly originate as an object of a null verb.

- (83) a. As in Mitterrand's France, Spain's cultural, media and regional life blossomed.
b. Cutting off the supply of nutrition to tissues in any part of the body has a further consequence – new blood vessels bud out from the already dilated vascular bed to make up the nutritional deficit.
c. Also there were the federations: groups of worlds which banded together and fought one another for supremacy.
d. First, the damaged tissues are sealed with tissue fluid and blood, which clots.
e. Crowds estimated at several tens of thousands massed in central Antananarivo daily in the week after the killings, as most workers apparently supported opposition calls for a general strike.
(all from BNC)
- (84) a. 'Course there is, pet,' said Mrs Beavis, and Archie, moving fast and silently, ghosted up the stairs to the landing.
b. Thousands of people are expected to waltz through the factory on the open weekend at the end of the month.
c. Claudia raced for the towel; he was still standing in the same place and still looking helpless as she dealt briskly with the spill.
d. Shares in the food and drinks conglomerate surged by 8 per cent in a week as speculation about a bid gathered momentum.
e. The water sluiced out through the open door carrying all before it: cigarette packets, banana skins, the shells of nuts, an old shoe.
(all from BNC)
- (85) a. A keen cricketer, until last year Mr. Collar could be seen regularly umpiring for Medstead.
b. they've been there before in invitation races or coxing in men's crews but

competing in international competition is quite a breakthrough

- c. Well Hartleys the er, the knitting wool people of Keighley the er, his son I soldiered with him

(all from BNC, idiosyncratic capitalization and punctuation in original)

(86) a. ‘Don’t parrot, girl!

- b. Every single member of the congregation was haring through the bushes of Wimbledon Common in search of flying saucers.

- c. While most of use [sic] were struggling to stay on the roads, the all-wheel-drive cars swanned along with barely a feather ruffled.

(all from BNC)

(87) a. It bludgeoned harshly with its ceaseless questions.

- b. To prevent static in fine, flyaway hair, always use a conditioner after shampooing and avoid plastic brushes.

- c. We re-arranged the room, swept and mopped, cleaned the windows, dusted the lockers and changed into combat kit for the day.

- d. Finally, Johansson makes a mistake: he brakes too late and Niki is unable to avoid having his wing clip his own rear wheel as he goes past.

- e. As Edward motored down Portsdown Hill, from the George, the harbour stretched out before him in the dying light.

(all from BNC)

A subset of the attested intransitive verbs require a particle or PP complement (88). Thus, although they are counted as intransitives for the corpus study, the frame in which they are attested is actually more complex than a simple intransitive. There are also a few “miscellaneous” intransitive examples which seem unlikely to fit easily into any of the typical meaning templates for denominal verbs (89).

- (88) a. The fact that it has well-defined aims and a specific medium of operation also augurs well for its successful continuation.
- b. Most think that the orang-utan branched off before the gorilla and the chimpanzee.
- c. He messed around with health, and look at the mess we are in.
- d. I certainly wouldn't dream of tagging along with you and Tara when you go sailing or sightseeing or whatever...'
- (all from BNC)
- (89) a. Sheridan looked as if he thought he was slumming.
- b. Until they sex out and start producing fry of their own we will still be able to make any positive decisions about just how easy or otherwise this species is.
- c. If he trumped with the Queen, once again the losing Diamond would go.
- (all from BNC)

Of particular interest is a set of verbs in which it appears that the source nominal could be an incremental theme of a creation event, constituting a potential counterexample to the theme constraint (90). Here it appears that an individual described by the nominal root is created in the course of the event. In addition to the examples in (90), which are drawn from the annotated corpus sentences, I also identified some similar denominal verbs that were found in the CELEX search but not among those randomly chosen for corpus annotation (91).

- (90) a. The newspaper-reading public – and the television audience of some 40 million who had never before been treated to live pictures from the Californian coast – revelled in the pictures of Gromyko and his polish and Czech wrecking crew(as John Foster Dulles put it) who complained, harangued, sulked and finally walked out as amendment after amendment was defeated by the

other conferees. [typos in original]

- b. Clasper looked out at the sea of open mouths which chorused against him.
- c. Aged heretics were hymning wailingly to their god-dictator, supervised by armed deacons.
- d. People paraded up and down, displaying their furs and finery, hailing their friends, seeing and being seen, streaming back and forth continually like swimmers in a pool.
- e. Babies of working class mothers are more likely to suffer from illness than middle-class babies for a variety of reasons: the mother's health and style of living, particularly whether she smokes heavily; the mother's diet; the mother's type of employment during the late stages of pregnancy; housing conditions, particularly heating; the use of ante-natal clinics by the mother during pregnancy.
- f. Sandy looked critically at her shoes, and hiccupped.
- g. The petrified brain smoked and steamed lazily, venting effluvia.

(all from BNC)

(91) quilt, leaf, serenade, sentence, draft, crap, fuss, sketch, moan, spit, decree, rhyme, plan, grimace, froth, rattle, jest, plot, gossip, fib, miaow

One interesting point about this subclass of verbs is that they seem to have a strong agent-oriented (or subject-oriented, if the subject is not an agent, as in (90g)) manner component. The notion of agent-oriented manner has been argued to account for the difference between *splash*-type verbs and *smear*-type verbs (92) (e.g. Hale and Keyser, 2002). Here, *smear* cannot be used as an inchoative since it requires an agent to take specific actions.

- (92) a. The children splashed mud on the wall.
b. Mud splashed on the wall.
c. The children smeared mud on the wall.
d. *Mud smeared on the wall.

(Hale and Keyser, 2002)

Note that the denominal verb subclass represented in (90) and (91) includes a number of verbs of sound emission (*harangue, chorus, hymn, serenade, fuss, moan, decree, rhyme, jest, gossip, fib, miaow, rattle*); these verbs entail a certain manner on behalf of the subject, often including certain physical actions involving the mouth and vocal cords. They do not refer only to the sound or speech product that is produced by the actions. I propose that there is a contrast between these verbs and putative verbs like *house* ‘build house(s)’ or *book* ‘write book(s)’, potentially because the set of actions involved in producing artifacts like houses or books is less well-defined. There are a variety of manners that could be used to produce such artifacts: the book could be typewritten, handwritten, dictated, etc. However, it is not possible to *harangue* by writing the content of the *harangue* down, nor *moan* by blowing a horn that sounds like a moan, etc (though a horn itself can moan).

The context in which these verbs are used is suggestive as well. In (90a) we see the only example of intransitive *harangue* in the annotated data; it is conjoined with non-creation, agent-oriented behaviors like complaining, sulking, and walking out. In (90b) we have the only example of intransitive *chorus* in the annotated data, and it refers to a group of people speaking together more than to the creation of choral music. The example in (90c), which is the only example of intransitive *hymn* in the annotated data, is admittedly less clear; it is difficult to say that this means something other than ‘creating hymn(s)’.

Most of the other examples in (90) could also be argued to emphasize a subject-oriented manner rather than an incremental theme. In (90d), *parade* refers to a manner

of motion, rather than the creation of a parade. In (90e), *smoke* refers to the particular (habitual) action of smoking cigarettes or other tobacco products, not to the creation of smoke. In (90f), *hiccup*, like the sound emission verbs, is associated with a particular set of physical actions. It is less clear that the use of *steam* in (90g) means anything other than ‘produce steam’, however.

From the list in (91), the verbs *quilt* and *sketch* are notable for being creation verbs that also involve a strong agent-oriented manner component and a stereotypical set of physical actions.

The consideration of agent-oriented manner also suggests an explanation for the observation in (93) by Harley (1999). In (93a) and (93b), the nominal root refers to physical actions or changes, taken (or undergone) by the subject of the sentence. I speculate that *drooling* refers not just to the production of drool, but to characteristics such as having a slack mouth and allowing drool to be emitted. In contrast, the intended, unavailable meaning of (93c) involves *cake* as the incremental theme of a creation verb. If the actions involved in baking a cake are not sufficiently ritualized and agent-oriented from the point of view of the hearer, the verb will be infelicitous.

- (93) a. The mud caked.
b. Jill drooled.
c. # Jill caked.

3.10.2 Apparent exceptions to the theme constraint

The notion of an agent-oriented manner component can also help to explain why there are a small number of well-established consumption verbs, such as *lunch* and *breakfast*. I believe the factor that makes these verbs felicitous is that they refer to the meal as a ritualized social activity, not to the object of consumption. In response to the question, Have you eaten yet?, it would be infelicitous to say #*Yes, I've lunched* (cf. *Yes, I've eaten lunch*); one speaks rather of *lunching* with one's friends.

We can also find ad hoc, felicitous examples of other food and drink as denominal verbs when they refer to social rituals or other salient activities, as in (94) and (95). In these cases I propose that the nominal is not an incremental theme, even if there is an individual participant in the event which can be described by the nominal root; see Section 5.4.3 for a discussion of implied event participants. Rather, the event type is sufficiently familiar to the interlocutors so that the nominal root can stand in as a name for the event.

- (94) a. Picked this bad boy up while I was beering it up in St. Louis.
 b. I'm doing nothing this weekend, still fried from my trip home, was beering from wednesday to monday and a long day driving yesterday...
 c. had the order, but lost it, even though i held a set list at one point and was beering with the guys after, ah well.
 d. Not a bad run considering you were beering the night before (4 beers counts as beering when you're over 30).
 (all from WWW)
- (95) a. [On a raw foods discussion board] Vin, Wanna do a three day grapefruit fast with me? Oh, come on...it will be fun [... discussion of grapefruit fast ...] I am definately [sic] going to do the rebounding while grapefruiting ...
 b. For the past several weeks Tyler and I have eaten a grapefruit every night, almost without fail. That's one (sometimes two) grapefruit for each of us, not just a half. Once we realized that grapefruiting was becoming a habit, Tyler bought serrated grapefruit spoons.
 (all from WWW)

Similarly, recall from Section 3.2.2 that it is possible to construct examples where the source nominal looks like a patient (96). These can also be considered cases where the nominal root is not an argument but stands in for an event type that, from the point

of view of the interlocutors, is ritualized.

- (96) You and your colleague work in a garment factory. On any given day you may be making gloves, socks, or neckties. At the end of the day, your colleague asks: What have you been doing today?
Answer: I've been necktie-ing.

3.11 Denominal Verbs and Telicity

Harley (1999, 2005) proposes that the boundedness of the nominal root in certain incorporation structures affects the telicity of the resulting denominal verb. Her key examples are the locatum verbs in (97)-(98), and the intransitives in (99).

- (97) a. John saddled the horse # for five minutes / in five minutes.
b. Sue boxed the computer # for five minutes / in five minutes.
c. Mom blindfolded a 6-year-old # for five minutes / in five minutes.
- (98) a. Susan watered the garden for an hour / in an hour.
b. Bill greased the chain for five minutes / in five minutes.
c. Jill painted the wall for an hour / in an hour.
d. Adelaide buttered the bread for two minutes / in two minutes.
- (99) a. The mare foaled # for five minutes / in five minutes.
b. Susan drooled for five minutes / # in five minutes.
c. The salmon spawned for five minutes / in five minutes.
(Harley, 1999, 2005)

The suggestion is that the boundedness of the noun determines the telicity of the denominal verb when the noun originates within the VP. Harley draws a parallel with VP-internal positions that have similar effects, offering the following paraphrases to show

that boundedness of both the surface direct object and the object of a preposition can influence telicity.

- (100) a. The mare had a foal. (telic) / The fish had spawn. (atelic)
b. Susan put the computer/computers into box/boxes. (a/telic depending on plurality)
c. Jill fitted the horse/horses with a saddle/saddles. (a/telic depending on plurality)
(Harley, 1999, 2005)

On Harley's theory, denominal verbs formed from bounded source nominals are always telic. Denominal verbs formed from unbounded (mass) source nominals are compatible with an atelic interpretation, although they can also be given a telic interpretation if the surface direct object measures out the event (e.g. *butter the bread* can be atelic, because *butter* is mass, or telic if the bread is interpreted as a bounded incremental theme).

A strong argument made by Harley is that this effect is missing from instrumental denominal verbs.

- (101) a. John hammered the metal for five minutes / in five minutes.
b. Sue brushed the dog for five minutes / in five minutes.
c. Jill raked the leaves for an hour / in an hour.

Despite the fact that instrument nouns are generally count, the verb has both a telic and an atelic interpretation, unlike locatum verbs with count source nominals. Harley (2005) argues that "this means that the source of these denominal roots cannot be within the argument structure of the vP, either as sister to *v*, or in the Inner Subject or prepositional object positions of a Small Clause". The comparison would be to adjuncts, e.g. (102). This provides support for Harley's distinction between incorporation (confla-

tion) and “manner incorporation”, and is a potential counterargument to my proposal which is for a uniform mechanism whereby all denominal verbs are formed by manner incorporation.

- (102) a. With a hammer, John hit the metal.
b. Sue stroked the dog with a brush.
c. Jill pushed the leaves with a rake.

There are several points to note here. First, it would not be surprising on my theory if the boundedness of nominal roots was, at least some of the time, reflected in their lexicalization as denominal verbs. Just as is the case for verbal roots, characteristics of the root determine how it is lexicalized in terms of subevents and argument structure. So for example *kiss*, *defuse*, and *push* are lexicalized differently; the same could be true of nominal roots without necessarily requiring two different underlying mechanisms, conflation and manner incorporation.

Second, it turns out that Harley’s generalization does not hold for all types of denominal verbs. Harley (2005) addresses only locatum verbs. However, for location verbs, which on conflation theories are supposed to have the same structure as locatums, the generalization does not hold. There are very few location verbs formed from mass nouns, but all those I am aware of are telic, e.g. *land*. Harley (1999) notes this phenomenon and attributes it to the particular semantics of location verbs: but then this negates the generalization that transfer of boundedness from nominal root to event is a structural fact about denominal verbs.

Goal verbs are also a problem for Harley’s generalization, as there does not seem to be a direct relationship between the boundedness of the nominal root and the telicity of the verb. There are count nouns that allow the formation of atelic verbs (*braid*), and mass nouns that only form telic verbs (*powder*) (103). Taking it for granted that Mateu is correct about goal verbs sharing a structure with location and locatum verbs, then

again we see that the generalization about transfer of boundedness from a nominal root inside the VP does not hold. Instead, Harley’s observation seems to be quite specific; of the causative change of state denominal verbs, only the locatums have the relevant property, so perhaps the property belongs to this subset of change of state verbs, because of its ‘transfer’ meaning component.

- (103) a. braid my cousin’s hair for an hour / in an hour
b. powdered the aspirin ?# for an hour / in an hour

There is a definite difference between location/locatum/goal verbs and instrument verbs, in that one has a result state and the other does not. It is clear that verbs like *jail* have a result component as well as a process component, because of the ambiguity of sentences like (104) (McCawley, 1971). However, this is attributable to a *resP* in the sublexical syntax of change of state verbs.

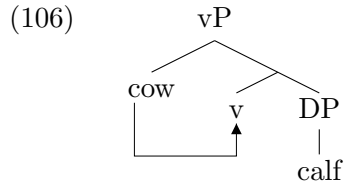
- (104) The sheriff of Nottingham jailed Robin Hood for four years.
‘RH remained in jail for four years’ / ‘soN repeatedly jailed RH for four years’
(McCawley, 1971, his (12))

3.12 Re-Deriving Structural Constraints

As noted in Section 3.3, the theory of Hale and Keyser is the primary previous theory that accounts for constraints on denominal verb meaning, by imposing syntactic constraints on denominal verb derivations. Many of Hale and Keyser’s grammaticality predictions come from a prohibition on incorporation from a specifier position, which I cannot appeal to. I show here how I can account for several constraints which Hale and Keyser attribute to facts about incorporation.

First we have the ungrammatical sentence (105), previously accounted for as a prohibition on incorporation from the specifier of VP in the monadic configuration (106) (Hale and Keyser, 2002, p.60).

(105) #It cowed a calf.



Impossible derivation involving incorporation from specifier (subject) position. Pleonastic subject takes place of moved subject.

My proposal makes a clear prediction about the ungrammatical sentence in (105). The missing interpretation, namely that the cow did something, is one where the nominal root introduces an initiator. I predict that this is impossible, since the nominal root must be interpreted as an event predicate and not an argument. The unmarked interpretation for (105) on my theory, assuming that the subject is more likely to be interpreted as a pronoun than an expletive, would be that some entity (*it*) was the initiator of an event, a calf was the undergoer of that event, and the event had the property of cow-ness. If forced to interpret the sentence, however implausibly, this could involve some entity hitting a calf with a cow, or behaving toward a calf in a manner typical of a cow, which are indeed the only interpretations (105) seems to have.

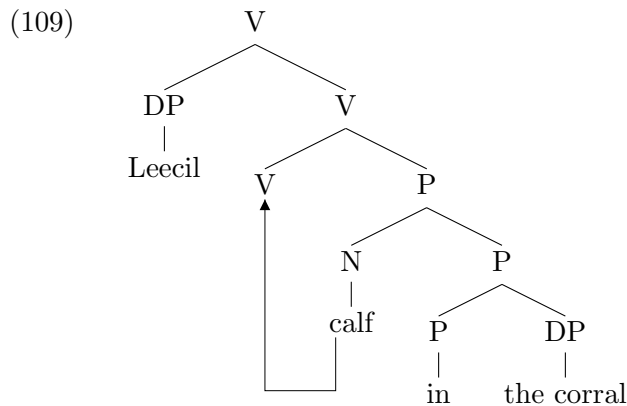
Next, we have the ungrammatical examples in (107), which are parallel to (105) except that the nominal root is supposed to be the initiator in a causative construction. For Hale and Keyser, the missing interpretation is based on the prohibition of incorporation from the specifier of VP, this time in the dyadic rather than monadic configuration. For me as well, the problem with (107) is the same as with (105). The obvious interpretation of (107a) is that some entity caused the horses to go blind by dusting (for some meaning

of *dusting*), and of (107b) that some entity caused the wine to go into bottles using a machine.

- (107) a. #It dusted the horses blind.
 ‘The dust made the horses blind.’
 b. #It machined the wine into bottles.
 ‘A machine put the wine into bottles.’

The next constraint is on sentences of the type shown in (108). For Hale and Keyser (2002, p.51) this results from a prohibition on incorporation from the specifier of PP, in such a way as to strand an overt location PP (109). The underlying structure would be appropriate for an incorporation analysis of *Leecil corraled the calf*, but with the noun *calf* attempting to incorporate from the specifier position of the PP.

- (108) * Leecil calved in the corral.



My theory provides what I believe is a simpler way of looking at (108), by reading the interpretation directly off the surface structure. The simplest interpretation for the PP is as a locative: something took place in the corral. The root *calf* must be interpreted as a modifier of the verb, and it is intransitive. Leaving aside the possibility of an

unaccusative, we assume that *Leecil* is the underlying as well as the surface subject. There is no surface object, i.e. no undergoer or holder of result state, except *Leecil* herself, so the Ramchand frame must be minimally v_iV_i . From the surface structure we do not know whether there is a result, i.e. whether it is v_iV_i or $v_iV_iR_i$. So the verb *calf* must describe either an activity or an achievement of which *Leecil* is both initiator and undergoer. Thus, (108) cannot mean that *Leecil* did anything to a calf, because there is no calf in argument position at all. In fact, given the lexicalized verb *calve*, this sentence seems to mean that *Leecil* bore a calf in the corral.

The same analysis holds for (110), which is parallel to (108) except that the underlying structure is assumed to contain the preposition for a locatum rather than location verb. There is no rope in object position. The obvious interpretation for *with rosin* is as an instrumental PP, and *Myrtis* must be both initiator and undergoer, so the interpretation is that *Myrtis* did something having the property of rope-ness, using rosin as the instrument.

- (110) **Myrtis roped with rosin.*
 ‘put rosin on the rope’

We next look at the examples in (111), which Hale and Keyser (2002, p.61-2) attribute to the impossibility of incorporation from the specifier of an AP in the complement of a null causative verb.

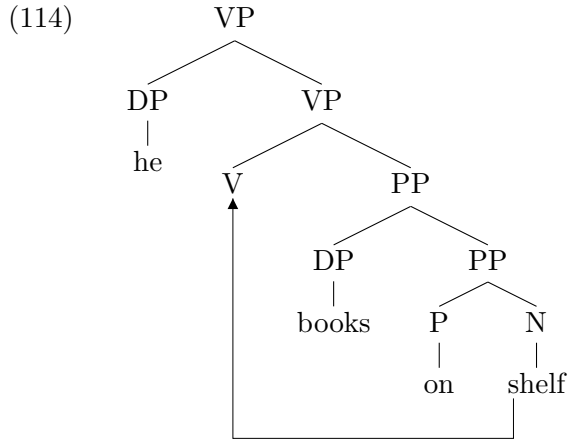
- (111) a. # *She metaled flat.*
 ‘flattened the metal / caused the metal to be flat’
 b. # *She speared straight.*
 ‘straightened the spear / caused the spear to be straight’
 c. # *They screened clear.*
 ‘cleared the screen / caused the screen to be clear’
 (Hale and Keyser, 2002, p.61-2)

Under my proposal, the problem would be that on the intended reading, the source nominal would have to introduce an event participant which is both undergoer and resultee. Looking at the surface argument structure, though, the only possible meaning of the adjective is either a resultative or a depictive. If (111a) were an intransitive resultative, the meaning would be something like ‘she did something with the property of metal-ness, resulting in her being flat’. Similarly, (111b) could be ‘she did something with the property of spear-ness, resulting in her being straight’, or as a depictive, ‘she did something with the property of spear-ness, while straight’. In fact there are comparable examples with a denominal verb *spear* meaning ‘move like a spear’ (112), although *straight* in these examples is adverbial rather than the adjectival intended in (111).

- (112) a. The sun is spearing straight into my eyes from the opposite side of the carriage, but the wizened old crone who occupies the opposite seat hasn't thought to close the blind.
- b. Pulling into the massive barreling wave, Van Bastolaer ducked at the last second, the abandoned jet ski narrowly missing his head and spearing straight into the shallow reef.
- (from WWW)

We now turn to two constraints that are attributed to factors other than incorporation from a specifier position. The first pertains to the examples in (113), and is accounted for by Hale and Keyser (2002, p.60) as a prohibition on incorporation from the complement of a PP across an overt preposition (114).

- (113) a. #He shelved the books on.
- b. #He corralled the horses in.
- c. # He bottled the wine in.



Hale and Keyser’s explanation is that the overt preposition blocks head movement of the nominal root. On my proposal, the examples in (113) are unsurprising: they are only acceptable to the extent that the sentence-final preposition can be interpreted as a resultative particle. This may require some non-standard interpretations, e.g. for (113c), closing up the wine closet by stacking empty bottles at the entrance (A. Marantz, p.c.). There is no reason to expect these examples to have Hale and Keyser’s intended interpretation, unless one is already assuming that denominal verbs are formed by head movement in sublexical syntax.

Finally, we consider the absence of intransitive location and locatum verbs (115).

(115) * The books shelved.

Hale and Keyser (1993) propose that (115) is ungrammatical because *shelve* ‘put OBJ on a shelf’, like the verbs *smear* and *daub*, has an externally-oriented manner component which requires the presence of an external argument. As Kiparsky (1997) also observed, locatum verbs have an intransitive variant only if they can occur spontaneously, e.g. *reel*, *spool*, *stack*, *dock*, *berth*, *land*. This same approach can be maintained within my proposal. Recall that for Ramchand (2008), verbal roots encode information about argument structure, and I propose that nominal roots coerced to verbal use acquire this information as well. The requirement of an external argument is equivalent to requiring

an *initP*.

3.13 Conclusions

In this chapter I have proposed that a nominal root modifies a subeventual skeleton to form denominal verbs in English. The nominal root does not behave like an argument, i.e. it does not behave like it was an initiator, undergoer, theme, or resultee in any underlying morphosyntactic structure. This proposal accounts for the missing initiator and theme/patient/resultee readings, and will be further supported in Chapter 5 by the fact that the nominal root does not introduce an event participant. I have argued against an incorporation view of denominal verbs in English on the grounds that, at least as the incorporation theory has been previously formulated, it does not predict the constraint against theme/patient/resultee readings of intransitive denominal verbs.

My proposal makes a prediction that denominal verbs should occur in all the verb classes that verbs from verbal roots do. This is borne out by a corpus study, which is described in detail in Chapter 4. Moreover, I have shown how several constraints on denominal verb formation, previously attributed to facts about incorporation, can be re-derived under my proposal.

4.1 Introduction

In Chapter 3 I made an observation and a prediction, both of which would benefit from exploration by a quantitative method. First, section 3.2.3 presented examples of denominal verbs which have been lexicalized as transitives, despite what appear to be equally plausible lexicalizations, based on typical activities involving the source nominals, as intransitives. I suggested that denominal verbs may show a tendency, as yet unverified and unquantified, towards a higher frequency of lexicalization in transitive (or more complex) frames rather than intransitive ones. If there is such a lexicalization bias, it may relate to the resistance of denominal verbs to an initiator, theme, patient, or resultee interpretation for the nominal root.

Second, in Section 3.8 I predicted, based on the syntactic analysis presented for denominal verbs in Chapter 3, that they should be able to appear in the same range of argument structure classes as verbs formed from verbal roots – though perhaps with a different frequency distribution across the argument structure classes.

To test the range of argument structure possibilities for denominal verbs, and whether there is a bias towards transitivity, I performed a corpus study. From the CELEX lexicon (Baayen et al., 1995) I selected a set of 250 denominal verbs and 250 verbs from verbal

roots. I then annotated up to 15 sentences from the British National Corpus (BNC; Burnard, 1995) for each verb, for a total of 3,303 sentences containing denominal verbs, and 3,403 sentences containing verbs from verbal roots. Each sentence was annotated with information about argument and event structure, and the annotations then mapped to argument structure classes in the style of Ramchand (2008) (see Section 3.4.2). This makes it possible to evaluate the relative productivity of denominal verbs and verbs from verbal roots in terms of their argument structure realizations.

A corpus study can also serve to verify that the theme, patient, and resultee readings are not available for intransitive denominal verbs, since the examples of denominal verbs are chosen at random from a lexicon, and the sentences at random from a corpus, rather than being chosen based on introspective judgements of salient examples. Furthermore, the corpus study will allow us to investigate what readings are available for intransitive denominal verbs. A corpus study is thus a useful way to ensure that the full extent of denominal verb productivity is understood, as well as to shed light on the gaps in productivity which have been suggested in Chapter 3. Finally, I pointed out in Section 2.4 that the traditional division of denominal verbs into semantic classes based on the role of the nominal root is input-oriented, thus failing to reveal constraints on productivity and resulting in an overly large “miscellaneous” class. The corpus study provides the opportunity to categorize denominal verbs in a more output-oriented fashion, in terms of argument-structure-based verb classes.

Section 4.2 briefly reviews previous corpus studies on denominal verbs. Section 4.3 describes how sentences were chosen from the BNC and annotated, and Section 4.4 gives the results of five experiments, while Section 4.5 concludes.

4.2 Previous Corpus Studies

Although there are a number of recent experimental studies on denominal verbs, there are surprisingly few corpus studies, and essentially none which look at the argument and event structure of denominal verbs. The lack of corpus studies may be attributed in part to the difficulty of automatically identifying examples of denominal verbs formed by conversion, which are by definition homographic with nominal examples except when tense marking clearly distinguishes them. Clark and Clark (1979) is still one of the largest empirical studies of naturally-occurring denominal verbs in English, but the verbs in this study were collected on an ad hoc basis and not systematically from a particular text or set of texts, and were also analyzed in terms of semantic classes and not argument structure. Davies (2004) is a more recent corpus study, while Cannon (1985) and Gottfurcht (2008) are dictionary studies.

Davies (2004) focuses on a variety of linguistic and extra-linguistic factors affecting the productivity of denominal verb formation by conversion. Using a list of conversion verbs from Marchand (1969) and Adams (1973), she extracts examples from the BNC, investigating the productivity of different inflectional endings with denominal verbs (as a proxy for lexicalization), the role of familiarity in proper name conversion, and various potential morphosemantic blocking factors. She does not consider argument structure in detail, but does record whether each denominal verb is attested as a transitive, intransitive, or both.

Davies considers the ability to appear as both transitive and intransitive a measure of how “fully” a noun has been converted to verbal use. This is an imperfect measure, since even verbs from verbal roots may have relatively inflexible argument structure, which does not imply that they are not genuine verbs. However, her raw data on transitivity, which I have tallied in Table 4.1, is perhaps the only previous corpus data addressing the question of transitivity bias in denominal verb lexicalization. It can be seen that

Class	Number
Transitive	293
Intransitive	75
Both	242

Table 4.1: Transitivity data from Davies (2004, Appendix 5): ability of 610 denominal verbs to appear as transitive, intransitive, or both, based on BNC data.

transitive verbs far outnumber intransitives (535 of 610 roots appearing as transitive, compared to only 317 as intransitive, including the ‘Both’ group), providing tentative support for the hypothesized transitive bias of denominal conversion verbs, although there are no verbs from verbal roots to compare with.

Cannon (1985) performs a study based on three dictionaries of new words and word senses published in the nineteen seventies and eighties. He reports that of 189 new denominal verbs, 100 were transitive, 60 were intransitive, and 29 could be either transitive or intransitive. Again, more denominal verbs were lexicalized as transitive than intransitive, but there is no data on verbs from verbal roots for comparison.

Gottfurcht (2008) compares denominal conversion verbs with denominal verbs formed by overt affixation (*-ize*, *-ify*, *-ate*, *be-*) in a large historical study based on data from the Oxford English Dictionary. She provides a frequency- and competition-based account in which speakers are said to be sensitive to the frequency of semantic classes (ornative, resultative, etc.) across competing morphological processes, and affixes tend to become associated with particular processes. For example, she finds that *be-* and conversion are more strongly associated with ornative (locatum) verbs, while *-ify* and *-ize* are more strongly associated with resultative (goal) verbs. Interestingly, conversion appears to have a flatter distribution across semantic classes than some of the overt affixes. However, no study is made of argument structure.

4.3 Procedure

In this section I describe the procedure used for the corpus study, including selection of verbs from CELEX, selection of sentences from the BNC, annotation of sentences, and mapping of the annotated data to Ramchand argument structure classes.

4.3.1 Verb selection

The first step was to select representative examples of denominal verbs and verbs from verbal roots. I used a dictionary-based search in which a root was assigned to the nominal or verbal population depending on historical precedence, i.e. whether it was first used in English as a noun or a verb. The advantages of this method are that it is simple to apply, requires no manual judgments, and that the historical information is readily available; I used the coding in CELEX which indicates whether a lemma is the result of conversion. For comparison, Plag (1999) also uses a dictionary-based method to identify denominal verbs in his study of twentieth century neologisms (though see the discussion therein regarding alternative classification methods). The intuition in the present work is that we wish to examine the range of argument structures that a nominal root in a verbal environment can take, and by using historical precedence as a criterion we are assured that the root in question was nominal-only at some stage of English, and thus had to acquire its verbal behavior. Using a dictionary-based search means that we include only denominal verbs which are sufficiently established to be listed in the dictionary; a systematic study of true nonce formations would be interesting, but far more difficult to accomplish systematically.

The distinction made here between two populations of verbs is certainly not uncontroversial. For example, Hale and Keyser (1993) propose that a large number of verbs, even those historically attested as primarily verbal in English, are built on nominal roots, while Borer (2005a,b), Halle and Marantz (1993, 1994), and others propose that roots

are uncategorized until they are combined with appropriate functional material; both approaches would invalidate a division of verbs into two populations based on the nominal or verbal nature of the root. However, I will proceed on the assumption that the historical facts speak for themselves: there are roots that are initially used by native speakers only as nouns, and we wish to investigate the behavior of such roots in verbal environments.

It could also be argued that the historical precedence criterion is problematic for a synchronic study because native speakers do not recognize well-established denominal verbs as denominal. However, LaRosa (2003) presents evidence suggesting that speakers' judgments of whether the nominal or verbal use of a root is "older" correlates with the historical facts. Though this study is small, it is the only one I am aware of which provides an empirical test of lay judgments on this question.¹

To select representative verbs from each population, I used the English portion of WebCelex², the online version of CELEX (Baayen et al., 1995), a lexical database of English, German and Dutch. CELEX includes both lemmas and inflected wordforms. Each lemma is coded for a wide variety of morphological, semantic, and phonological features. For this study I used the part of speech and a "morphological status" value indicating whether the lemma is monomorphemic or complex, and whether it is the result of conversion. Lemmas that appear with multiple parts of speech have multiple database entries.

To find denominal verbs, I searched CELEX for verbs which are monomorphemic (to exclude verbs with overt derivational morphology), coded as conversion verbs, and for which the same lemma also appears as a noun.³ To find verbs from verbal roots, I

¹LaRosa also suggests that speakers' ability to judge historical precedence differs across subclasses of denominal verbs, but the overall results show a positive correlation with the historical facts for all subclasses.

²<http://celex.mpi.nl>

³There were a small number of false positive examples such as *firm*, which is a conversion verb with a homographic noun, but where the conversion is deadjectival. These examples were manually removed from the search results.

searched for monomorphemic verbs which are *not* coded as conversion verbs. This search found verbs with no homophonous noun, as well as verbs with a homophonous deverbal noun, both of which are included in the population of verbs from verbal roots. The search resulted in 1,053 denominal verbs and 1,613 verbs from verbal roots.

Since it was not practical to annotate examples of all the verbs found by the CELEX searches, the lists were randomized and the first 250 verbs from each list selected for annotation. If no BNC sentences were found for any given verb, then the next verb from the randomized list was selected until there were 250 verbs in each population with at least one BNC sentence. Unsurprisingly, there were more denominal verbs than verbs from verbal roots that had no example sentences in the BNC, since verbal uses of nominal roots can be assumed to be less frequent than verbal uses of verbal roots.

The verb selection method based on CELEX is not perfect. In the course of the study I identified a small number of clearly misclassified lemmas; in addition some of the lemmas identified in CELEX as conversion verbs fall into the category of noun-verb pairs that shared a common root in Old English (see Section 2.2), and the classification as denominal is therefore somewhat arbitrary. I believe it would be worthwhile in future work to perform a similar study, but filtering the roots in the denominal verb population for relatively recent attestation as verbs. However, for this initial study the benefits of using CELEX as an efficient and automatic way of identifying members of the two verb populations outweighed the potential for some noise in the classification.

4.3.2 Sentence selection

Having selected representative verbs, one possible approach would have been to manually assign to each verb its typical argument structure. For example, one might intuitively classify *run* as unergative, or Ramchand class $v_i V_j$. However, intuition is unreliable when trying to identify the complete set of frames for each verb. Another possible approach would have been to use an existing dictionary of subcategorization frames, but these

are not comprehensive, usually based on intuition rather than on corpus data, and not always at the correct level of granularity. Instead, I investigated the argument structure possibilities by examining a number of sentences for each verb.

The sentences were chosen from the British National Corpus (BNC; Burnard, 1995). The BNC is a 100 million word corpus of contemporary (later part of the twentieth century) British English. It consists of 90% written texts and 10% spoken word transcriptions. The written part is balanced across several genres including newspapers, periodicals, journals, academic books, fiction, letters, and school essays.

I chose to use the BNC rather than other comparable corpora because it is already automatically annotated with Part of Speech (POS) tags, which I used to aid the filtering of relevant examples. Automatic POS tagging is not 100% reliable in the best of cases and much less so for words which may be the result of conversion, which are by definition ambiguous as to part of speech. Because of this, I used the automatic POS tags only to pre-sort examples for consideration, ranking likely candidates for denominal verb usage higher than those which were likely nominal usages, but I manually examined each candidate sentence to determine whether it should be included.

I chose sentences from across the entire BNC. Given a target lemma from one of the lists obtained from CELEX, a purpose-written Perl script automatically retrieved all BNC sentences containing the lemma. Another purpose-written Perl script then sorted the sentences according to the POS tag of the target lemma, with the usages tagged by the BNC's automatic POS tagger as verbal placed at the top, followed by the ones the tagger had marked as ambiguous, and then by those it had marked as nominal. Within each POS tag grouping, the order of sentences was randomized.

I then examined the resulting list of sentences in order, manually annotating each one with information about argument and event structure (see Section 4.3.3 for the annotation procedure), up to fifteen sentences per verb. I discarded any sentence where use of the target lemma was not verbal, which was quite frequent for the nominal roots,

despite the pre-sorting by POS tags, because of noise in the automatic POS tagging. I also discarded sentences for several other reasons: if the sentence was a fragment which did not show the full argument structure of the target verb; if the sentence was clearly archaic or flagrantly ungrammatical in my opinion, so that I felt it clearly did not represent a legitimate, contemporary example of the verb's argument structure; or if the topic of the sentence was so obscure to me that I could not discern the argument structure of the verb. Adjectival passives were discarded. Verbal passives and participial modifiers were retained only if there were other, active-voice examples of the same verb. I annotated sentences until I either reached fifteen examples or ran out of candidate examples for that verb. If the verb was used more than once in a sentence, I annotated the first instance.

The upper limit of fifteen examples had no motivation other than keeping the annotation workload to a practical level. It is known that this is an insufficient number to obtain a full picture of each verb's argument structure possibilities. For comparison, Korhonen (2002) created a manually-annotated gold-standard subcategorization frame resource and found that 200-300 example sentences were needed per verb for a comprehensive list of subcategorization frames, so as not to miss rare frames. However, this quantity of annotation would not have been practical in the present study. The goal of this study was also different from that of Korhonen (2002); I was not attempting to develop a comprehensive lexicon of Ramchand argument structure classes for each verb, but rather to compare two populations of verbs, for which identifying most of the frequent classes should be sufficient. I did occasionally notice during annotation that an argument structure frame was missed because it occurred for the first time after the fifteenth sentence in the list. However, since example sentences were sampled the same way from each verb population, I assume that frames were missed in equal proportion for denominal verbs and verbs from verbal roots, and thus this factor should not affect the results.

4.3.3 Annotation

I did not annotate directly for Ramchand argument structure classes, for three reasons. First, and most importantly, some of the classes are defined by argument structure alternations, so the class can only be identified based on multiple examples. Second, I wanted the annotation to be reasonably general and not tied to Ramchand's framework. Third, annotation is easiest when decisions are simple, so the decisions to be made for each sentence were set up to be as simple as possible. For these reasons I annotated according to a general scheme and used a purpose-written Perl script to translate those annotations into Ramchand classes for each verb. I annotated for the following features of verb tokens: transitivity, observed argument frame, nature of the subject and object, and the presence or absence of a result phrase.

First, transitivity was annotated as either transitive, intransitive, or ditransitive. The annotation took into account only the surface transitivity of the sentence, without regard for whether the surface subject might be an underlying object, whether there could be an omitted understood object, or whether I believed the transitivity of the verb could alternate. Example sentences from the annotated BNC data are shown in (116). Clausal complements and quotatives (see Table 4.2 for examples) were marked as transitive during annotation, but not counted as transitive for the experiments described in Section 4.4 (unless, of course, an additional direct object was present).

- (116) a. They were both awed by the vastness of the forest in which so much could take place unseen. (Transitive)
- b. However there is one thing that could hiccup there. (Intransitive)
- c. These planks he marked A, B, C, etc., and all the man had to do was to sight along them in the proper order and he could not help getting the line right. (Ditransitive)
- (all from BNC)

Second, the observed argument frame was annotated using a set of codes. This annotation went beyond transitivity to other aspects of the construction in which the verb was observed, including prepositional phrases (PPs) both optional and obligatory, resultative adjectives both optional and obligatory, particles, PP complements (in the sense of Neeleman (1997)), clausal complements, quotatives, the *X's way* construction, and the *Vs it (up)* construction. Again, the annotation depended only on the surface realization of the sentence. Determining the appropriate code often required somewhat difficult judgment calls, however, especially regarding optionality of PPs, and as a result there is likely to be some noise in the annotation of this feature. I assume that errors and inconsistencies occurred with equal frequency across the denominal verb examples and the verbs from verbal roots, so that they introduce no overall bias in the results. The full set of codes is shown in Table 4.2, along with examples from the annotated BNC data.

Third, the nature of the object (for transitives) or subject (for intransitives) was annotated. For transitives, this meant identifying whether the object was an undergoer, the object of a creation verb, a non-creation incremental theme, a cognate object, or a measure phrase. For intransitives, this meant identifying whether the subject was an initiator, an underlying object, or an initiator where the verb had an understood object. This coding was used when mapping the annotated data to Ramchand classes, to help identify transitivity alternations and verbs taking incremental themes. The codes are shown in Table 4.3, along with examples from the annotated BNC data.

Finally, the annotation marked the presence or absence of a result phrase. For Ramchand, the presence of *resP* equates with telicity, and I followed this approach, using standard telicity tests and marking each sentence **R** for result or **N** for no result. It is also possible to equate a result phrase with a *result state* rather than a culmination. There is good evidence (e.g. ability to support restitutive *re-*) that result states are syntactically represented (Dowty, 1979; Kratzer, 2000, 2004; Marantz, 2005b, 2007), and I believe that

Code	Meaning	Example(s) from BNC
Codes representing single arguments/adjuncts		
Y	Simple.	We, I <u>stapled</u> them all la ages and ages ago and they still came off.
H	Optional path/goal PP or resultative particle. Includes <i>around</i> and durative <i>away</i> and <i>on</i> . Meaning in combination with verb should be compositional.	He certainly had an air-freight business, but he was suspected of <u>freighting</u> illegal immigrants from Belgium into Britain. They <u>pumped</u> out the Patience and managed to stabilise it after about two hours.
U	Obligatory path or resultative PP (unselected object). Transitives only.	We played an exhibition match with Jack Nicklaus just before the 1967 Open and, as we say in Scotland, ' <u>golfed</u> the heed off him'.
P	Particle, separable if verb is transitive, often non-compositional.	Claire seems to have <u>tagged</u> along somehow. When police finally <u>flagged</u> him down he told them: 'I knew I was wrong but I couldn't turn around.'
J	Optional resultative adjective.	Merrill <u>stapled</u> a batch of papers together.
S	Obligatory resultative adjective (unselected object). Transitives only.	He <u>brushed</u> aside her thanks.
A	PP complement (in the sense of Neeleman (1997)). Obligatory.	Meet the 8 children, 4 of them disabled, who <u>pitted</u> their wits against 96 teams from around the UK and beat the lot.
Z	Strongly selected but optional PP.	But primitive man <u>guards</u> himself against that by listening in to the being of the person who is uttering the words and by adding this to his evaluation of the words.

Code	Meaning	Example(s) from BNC
Codes representing single arguments/adjuncts, cont.		
M	Obligatory clausal complement, finite or non-finite.	Or was she trained, and her body <u>geared</u> , to subsist on any available fodder whatever, algae, cockroaches, rats, who cares? With magnanimity, perhaps mindful of his own ambitious plans for prison reforms more than thirty years earlier, the Prime Minister <u>minuted</u> on 10 May: By all means mature your proposals.
N	Optional clausal complement, finite or non-finite.	I remember he <u>sentenced</u> Julie (Burchill) to review Gilbert O'Sullivan in Croydon as a punishment for taking amphetamines in the office.
E	Quotative / manner of speaking.	'Yes,' <u>chorused</u> the girls.
W	<i>X's way</i> construction (always transitive).	Hugging the bank we laboriously rowed and <u>poled</u> our way past the endless stone quays of riverside hotels and the flanks of cruise ships.
D	<i>Vs it</i> construction (always transitive).	And were the Brodskys simply <u>slumming</u> it for the sake of a little pop action?
Codes representing combinations		
K	P+H	When it had finished, it <u>hared</u> off across the garden as if it had done something clever.
B	P+Z	But today, angry customers like Banbury businessman, Michael Cratchley, who <u>forked</u> out 4,000 for a holiday in France, say they've been badly let down.
Q	P+E	'Walls have ears,' <u>piped</u> up a white-haired old lady.

Code	Meaning	Example(s) from BNC
Codes representing combinations, cont.		
I	H+Z	Waking or sleeping his mind <u>fretted</u> away at the case, images drifted in and out of his consciousness, words and phrases came to mind in a confusing jumble but once, in a doze, it seemed that Beryl was actually speaking to him in her clear, cracked voice.
L	A+N	I was <u>champing</u> at the bit to investigate Stanford shopping precinct before my 2 p.m. hospital appointment with Dr Levy and his team, so Kenneth hastily finished his third helping and we walked the short distance to the precinct.

Table 4.2: Annotation codes for the surface frame of the sentence, with examples from the annotated BNC data.

such an interpretation would be consistent in a general way with Ramchand’s overall program of event decomposition in the syntax, though I do not undertake here to show how her theory would need to be modified. I therefore annotated for the result state interpretation of *resP* as well, using the tests given in Kratzer (2004) and Marantz (2007), with a second **R** or **N** code. Most of the results presented in the rest of this chapter use Ramchand’s interpretation of *resP*, that is, telicity; but the experimental results with the result state interpretation are discussed in Section 4.4.2.

When annotating for the presence of *resP*, it was necessary to factor out the influence of constructional elements such as particles, resultative adjectives and PPs as much as possible, since these elements can contribute telicity that is not inherent in the root. Path PPs (H in Table 4.2), strongly selected PPs (Z), and optional resultative adjectives (J) were ignored for the purpose of the telicity judgment. Sentences with particles were

Code	Meaning	Example from BNC
Transitives: Coding describes surface object		
U	undergoer, i.e. standard object	Tajan's bankers, however, <u>vetoed</u> the project.
C	object of creation verb	
I	incremental theme non-creation	He <u>wolfed</u> down his breakfast and after buttoning up his overcoat, swathed a muffler round his neck, covering his mouth and nose.
G	cognate object	Bellybutton, a straw hat over his eyes, <u>danced</u> a few ludicrous steps on the deck of the workboat, thus looking for all the world like a simple Bahamian native welcoming the nice white folks from Georgia who now stood blinking in the bright sunlight beside a growing mound of their designer-label luggage.
M	measure phrase	It was intercepted by Nigel Davies, who <u>raced</u> 65 metres to score under the post.
Intransitives: Coding describes surface subject		
S	subject	So if it <u>peaks</u> two years before you plan to cash in, you do not lose because you had to wait for the money.
O	underlying object	At the far end, clean sheets were <u>airing</u> under an open roof.
U	understood object	NOTE: Before you start <u>shampooing</u> , check that the carpet is well secure around the perimeter.

Table 4.3: Annotation codes for the nature of the object and subject, with examples from the annotated BNC data.

not annotated for *resP*, since it is impossible to separate the contribution of an obligatory particle from the contribution of the root, and sentences with clausal complements or manner of speaking verbs were also not annotated; thus the mapping to Ramchand classes did not rely on such sentences when deciding whether the verb belonged in (a)telic classes.

The annotation for *resP* also required some fairly difficult judgment calls when applying the telicity and result state tests, and so there is likely to be some noise in the annotation of this feature. Again, I assume that errors and inconsistencies occurred with equal frequency across denominal verbs and verbs from verbal roots, and should not bias the comparison of these two verb populations.

4.3.4 Mapping to Ramchand frames

The final step in preparing the corpus data for the experiments was to map the annotated sentences for each verb into a set of Ramchand classes. I used Ramchand’s core classes plus an additional class for verbs with clausal complements, which Ramchand does not discuss. I developed a set of rules for this purpose, taking into account all the annotated sentences for each verb (recall that multiple examples must be considered in order to identify alternating classes). For example, a verb that appears as a simple transitive, with an undergoer object, and passing the tests for telicity, will correspond to vV_iR_i . However, if the same verb is also observed as a telic intransitive where the subject is judged to be an underlying object, then this indicates an alternating class, V_iR_i .

The mapping rules were defined manually and iteratively, inspecting the output multiple times correcting any errors. Repeated inspection of the output throughout the annotation process also allowed for correction of annotation errors that were revealed by the mapping process.

Many verbs appear in more than one Ramchand class, which is not surprising. This is occasionally due to the polysemy of a root. For example, *peep* can mean ‘look’ or ‘tweet

(bird sound)', *grizzle* can mean 'cry' or 'become gray', and *strand* can mean 'abandon' or 'make into strands'. Root polysemy has implications for argument structure, and can therefore confuse the assignment to Ramchand classes by implying alternations that are really sense alternations. While such cases would probably be better analyzed as two roots, it was not possible to do this, since CELEX does not distinguish word senses. However, there are also many cases of roots with multiple, highly-related senses, which I assume are due to a common root being used in different contexts, and thus legitimately analyzed as members of multiple (or alternating) Ramchand classes.

4.3.5 Experiments and statistical evaluations

Five experiments were performed to test whether the population of nominal roots behaves differently from the population of verbal roots in terms of argument structure in verbal environments. The experiments and their results will be described fully in Section 4.4, but I give a brief overview here.

The first experiment tests the type frequency of transitive, intransitive, and ditransitive constructions, i.e. how many roots surface as transitive, intransitive, and ditransitive verbs, as well as the overall token frequency of the two verb populations in intransitive constructions. The second experiment tests how many roots surface in the different Ramchand classes. The third experiment looks at the Ramchand classes of verbs from the two populations that appear in only a single class, on the assumption that this may provide a window into an earlier stage of conversion and magnify any transitivity bias.

The fourth experiment explores the hypothesis that nominal roots, which may not be as strongly associated with particular event schemas as verbal roots are, may be more "flexible" in their argument structure than verbal roots. It tests whether a typical nominal root occurs in more Ramchand classes than a typical verbal root.

Finally, the fifth experiment tests whether denominal verbs occur more often with extra "framing" elements such as particles and PPs, which might aid their interpretation

by the hearer.

In each case, I tested whether membership in the nominal or verbal root population was predictive of behavior in verbal environments. Significance was measured with the χ^2 test.

4.4 Results and Discussion

This section describes the results of the corpus study.

4.4.1 Experiment 1: Transitivity

The first experiment tests whether membership in the nominal or verbal root population predicts whether the root can surface as a transitive, intransitive, and/or ditransitive verb. Considering argument structure classes as types, the experiment measures the type frequency of transitives, intransitives, and ditransitives, for verbs drawn from the two populations.

For this experiment, a root is considered to surface as an intransitive if it ever appears in an intransitive frame, regardless of token frequency, transitivity alternations, unaccusativity, or the presence of an elided understood object. A root is considered to surface as a transitive if it ever appears with a direct object, including *way* in the *X's way* construction and *it* in the *Vs it (up)* construction. Any given root can appear in one or more of the transitive, intransitive, and ditransitive classes. Clausal complement and manner of speaking examples are not counted.

The results are shown in Table 4.4. We can see that nominal roots are significantly more likely to appear in transitive frames than verbal roots are. There is also a trend toward nominal roots being less likely to appear as intransitives than verbal roots, but the difference does not reach significance. This result supports the observations in Chapter 3, namely that there is no prohibition on intransitive denominal verbs, but denominal verbs

	V	N
Appear in transitive frame	193*	222*
Appear in intransitive frame	173	164
Appear in ditransitive frame	6	9

Table 4.4: Type frequency for argument structure classes. Of 250 nominal roots and 250 verbal roots used as verbs in the BNC, number that appear as transitive, intransitive, and ditransitive. Asterisk indicates significance (χ^2 test, $p < 0.05$).

	V	(%)	N	(%)
Intransitive examples	1382*	(40.6)	966*	(29.3)

Table 4.5: Overall token frequency for intransitive class for two verb populations. Number of intransitive examples for verbs formed from nominal and verbal roots. Total examples: 3,403 for V and 3,303 for N. Asterisk indicates significance (χ^2 test, $p < 0.05$).

do have a significant bias towards appearing as transitives.

We can also consider token frequency, that is, how many annotated sentences use denominal verbs in intransitive frames compared to verbs from verbal roots. Table 4.5 shows the overall token frequency for the intransitive class for the two verb populations, i.e. the number of sentences in which nominal and verbal roots appear in intransitive frames. We can see that nominal roots are used with significantly less frequency in intransitive environments than verbal roots are.

In fact, there are 47 nominal roots (out of 250) with only a single intransitive example in the set of annotated sentences, compared to only 25 verbal roots. This phenomenon provides additional substantiation for the claim that nominal roots can occur in the same argument structure classes as verbal ones, but that there is a significant bias towards using them transitively, even for roots that have attested intransitive uses.

4.4.2 Experiment 2: Ramchand classes

This experiment measures the type frequency of the various Ramchand classes for the two verb populations, testing whether membership in the nominal or verbal root population predicts the probability of a root occurring in the Ramchand classes. Table 4.6 shows the major Ramchand classes and how many roots from each population were members of that class. Corroborating the simple transitivity experiment, the populations show significant differences for both transitive activities (vV) and transitive achievements (vV_iR_i), with nominal roots more likely to belong to these classes. Again, there is no significant difference for the intransitive classes, although there is a trend towards nominal roots being less likely to belong to these classes.

One other significant difference can be seen in Table 4.6, namely that verbal roots are significantly more likely to occur as statives. In fact I found no examples of statives from nominal roots, although Lieber (2004, p.93) claims that these exist, e.g. *bay*, *landmark*. I have no explanation for why nominal roots would be unlikely to occur as stative verbs, but we might speculate that stative verbs are a relatively closed class, and that innovative verbs in general are more likely to be dynamic.

After taking into account these differences between nominal and verbal roots, it is striking how similar the distribution across Ramchand classes looks for the two populations of verbs in Table 4.6. This corpus result provides strong support for the theoretical claim that denominal verbs and verbs from verbal roots share the same sublexical structure. Table 4.7 and Table 4.8 show the verbal and nominal roots, respectively, which appeared in each Ramchand class.

In Section 4.3.3, I mentioned that it was possible to construe *resP* as a result state rather than a culmination of the event. Using the result state judgments instead of the telicity judgments, we have the results in Table 4.9 as an alternative to Table 4.6. This time the only difference between nominal and verbal roots that reaches significance is the occurrence of more nominal roots in the transitive activity class (vV), although

Frame	Description	V	N
v_iV_i	unergative activity (<i>run</i>)	131	125
vV	transitive activity (<i>drive, push</i>)	61*	94*
$vV\langle\text{path}\rangle$	incremental theme (accomplishment) (<i>eat, read</i>)	32	30
V	alternating activity (<i>melt, roll, freeze</i>)	13	15
V_iR_i	alternating achievement (<i>break, tear</i>)	19	14
vV_iR_i	transitive achievement (<i>throw, defuse</i>)	115*	141*
$v_iV_iR_i$	intransitive achievement (<i>arrive, jump</i>)	47	39
vVR	ditransitive (<i>give, throw</i>)	6	9
clausal	clausal complement	29	18
stative	stative	4*	0*

Table 4.6: Type frequency for Ramchand classes. Number of nominal roots and verbal roots appearing in each Ramchand class, out of 250 total examined for each class. Example verbs are from Ramchand (2008). Asterisk indicates significance (χ^2 test, $p < 0.05$).

there is still a trend towards more nominal roots surfacing as transitive achievements (vV_iR_i), which does not reach significance. Overall, in Table 4.9 there are far fewer verbs with *resP* than in Table 4.6. This could mean that fewer verbs have result states than culminations, or it could be an artifact of the treatment of semelfactives, which are considered both telic and atelic by Ramchand, possibly inflating the *resP* totals, but which do not arise in the result state interpretation of *resP*.

4.4.3 Experiment 3: Single-class verbs

This experiment looks at denominal verbs and verbs from verbal roots that belong to only a single Ramchand class. Here I make the assumption that conversion is a gradual process, in which a nominal root is used first in a single verbal frame and then has the potential to spread to other frames. If this is the case, then the denominal verbs that appear in only a single frame represent a window into an early stage of the conversion process. It is not a perfect representation, since even verbs from verbal roots may have relatively inflexible argument structure; the fact that a denominal verb appears in only

Frame	Verbs (V)
v_iV_i	account accrue act bang bash battle bet bide blend bore caravan care carp caterwaul cavort caw champ chase chaw chew clank commune compete connive cop copy cough crimp croon cry dance dash discipline dowse drivell drizzle drool flare flop fret frivol galumph glance gloat glow grin grizzle guffaw gurgle guzzle hack hail hark heave hurtle hustle incise jangle jar jeer jib jumble lag lead live lounge lour maim maunders mine mount muffle parse peep pierce pilfer pine plunder prance preach press pry puddle pulse rail rave ride riot rip rustle saunter scale scourge sift skimp sleet slit slumber snatch sneer snigger sprawl squeeze squelch stammer stoop stow strum swallow swash swear swot tender thrash toil trawl trek twiddle twinkle vaunt wade waffle wallow wave wheeze whirr whittle work wrest writhe zoom
vV	bash battle blanch blend bore brook chase chew comfort copy cost discipline dish dowse drizzle flaunt flog grip hack hash heave hog hug hustle jag jeer lag lave lead live menace plunder press purvey ride rip risk scourge scrub shape shew show sift skimp spank squeeze stammer strand strum take tease thrash toast tote trammel trawl twiddle vaunt visit wave whittle
vV<path>	bide bore chew congeal cost crimp croon drool etch fart gurgle guzzle hack heave mine mount plunge preach range sail scale scrub slump swear take thrash toil trek wade wave wheeze whittle
V	bang braise clank ferment jangle plunge pulse rustle sail show smell squirt whirl
V_iR_i	bang bash bend blend clank click condense crimp crush fuse ignite parse poise pulse retract snick squirt start warp
vV_iR_i	accost answer apparel attack bash belch bet blanch bless bogey braze bring chop claim compass conceal conquer contact contuse convince convolute cop copy crick crush cull dance declare discipline don dowse dye earn etch fatigue flee foil forfeit glut grizzle hack hail heave hitch hock hurtle incise inherit insert jag jar jettison jumble lag lave lick list maim maul mine miss mount muffle murmur notch orphan pierce pilfer plunder plunge poise press pry puddle purge purloin quash range ransom rend rescue rip scale scourge slake slit slump snatch solve spank squander squeeze state stow strand strew strip strum swallow swear swoop swot take tender thrash toast toil trawl trek trounce usurp wave win wrest zoom
$v_iV_iR_i$	answer bang belch bet blanch bogey cease clank click congeal consent cough craze croon cull declare fare fart flare flee flop hack hark heave ignite miss mount object peak peep plunge pulse shape slump sprawl squeeze squelch strum succumb swallow swash swear swoop wave win yelp zoom
vVR	cost dish flog reckon shew show
clausal	accost act bet care cease champ claim comfort conceal connive consent declare fret insert murmur pine poise press rail reckon risk seem shew show start state swear tease warrant
stative	account range seem warrant

Table 4.7: Verbal roots appearing in each Ramchand class. See Table 4.6 for a description of the classes.

Frame	Verbs (N)
$v_i V_i$	augur balk band barbecue bark beam blazon bludgeon bone book bottle brake branch bridge brush buck bud bulk bull bum chance charm chorus chum claw clip clock clot club coal cox crank crayon dice dose dredge drum farm feud flag flake foam foot force freight frowst funnel gear ghost gloss golf guard harangue hare heel hiccup hoard home hose hymn lace lasso leaf lime mass mate mess milk mill model mop motor nose panic parade parrot peak peal pet pipe plough pole price print pump queue race rage sand scull seam sex shade shoal side skate slave sluice slum smoke soldier spar spear spike spoon sport spur steam surge swan swig switch tag test thatch thread tile trench trump tug umpire waltz whale whang wrench
vV	augur awe bait balk bevel bill birch blazon blitz blot bludgeon bomb boss bridge brush buck bugle bull cane chance charm chart chum cinch claw clip clock cloud club cox curry dredge drum farm flake force ford freight guard gum guy hand harangue herd hose husband hymn lampoon lime malt mark mash mess milk mob model mop nark nose parade parrot pet pipe plague plough pole quilt sand sap sauce scull seam serenade shade shampoo shield silhouette slum smoke spear sport spur squire steam stomach syringe test thread toe trench trust tug umpire wolf
$vV\langle\text{path}\rangle$	barbecue bark beam bull chalk chart clip crayon ghost gloss hose ice mark mash parade peal pipe plough print race score smoke swig test thatch thread tile vote whelp wolf
V	air billet crank flake foam gum ice pair phase plunk pump sluice star swivel wheel
$V_i R_i$	board bud catapult clot hood kink knee mesh part plunk print pump spike switch
$vV_i R_i$	air alarm axe bait band bark bevel bill birch blazon blitz blot bolt bond bone book bottle brain bridge brush bulk bull bum cane cap carpet castle catapult chalk chance chart cinch claw climax clip clock club cord cork corral cosh cube cuckold curb dam dice dike doom dope dose dredge farm flag fleece foot force ford fork freight fringe funnel gear gloss goof grass guillotine gum hand heel herald hoard ice lace ladle land lasso libel mark marshal mash mass mate mill mint minute model mortise nark noose nose pair palm parole parrot pawn pet pin pit plough price queue quilt race roof rout sack score seam sentence sex shackle shade shoe sign size sop spear spike spoon spur stable staple starch style summons switch tag test thread tile trap trench trump tug twig veto vote wall whelp wrench yoke
$v_i V_i R_i$	bark bill blossom bolt book buck castle chance chart claw climax cloud drum flag fork funnel gel goof grass hiccup land mass mesh peal pearl pit pump score shampoo sign stale surge swig triumph trump twig vote wall whelp
vVR	bill blazon hand mark price sign style tag vote
clausal	awe blossom book boss chance doom dope force gear harangue minute panic pipe price spur trust twig vote
stative	—

Table 4.8: Nominal roots appearing in each Ramchand class. See Table 4.6 for a description of the classes.

Frame	Description	V	N
v_iV_i	unergative activity (<i>run</i>)	144	135
vV	transitive activity (<i>drive, push</i>)	109*	143*
vV<path>	incremental theme (accomplishment) (<i>eat, read</i>)	32	30
V	alternating activity (<i>melt, roll, freeze</i>)	20	19
V_iR_i	alternating achievement (<i>break, tear</i>)	12	9
vV_iR_i	transitive achievement (<i>throw, defuse</i>)	75	86
$v_iV_iR_i$	intransitive achievement (<i>arrive, jump</i>)	15	17
vVR	ditransitive (<i>give, throw</i>)	6	9
clausal	clausal complement	29	18

Table 4.9: Type frequency for Ramchand classes with *resP* as result state. Number of nominal roots and verbal roots appearing in each Ramchand class, with *resP* as result state, out of 250 total examined for each class. Example verbs are from Ramchand (2008). Asterisk indicates significance (χ^2 test, $p < 0.05$).

one frame does not necessarily mean it is a recent coinage. However, if denominal verbs exhibit a transitivity bias, we might expect it to be magnified among the single-class verbs.

The results are shown in Table 4.10. Between the two verb populations, those with nominal roots are significantly less likely to belong to the unergative class (v_iV_i) than verbs from verbal roots. They also show a trend towards belonging more frequently to the transitive activity class (vV) than verbs from verbal roots, though this trend does not reach significance. Assuming that this subset of denominal verbs gives a snapshot of the beginning of conversion, perhaps before the roots develop greater polysemy in their verbal uses, there is some support here for a transitivity bias (or at least a bias against intransitives) for denominal verbs.

4.4.4 Experiment 4: Flexibility across frames

This experiment tests whether nominal or verbal roots are more flexible in their argument structure realization. I hypothesize that nominal roots are less strongly associated in

Class	Description	V	N
v_iV_i	unergative activity	38*	23*
vV	transitive activity	11	19
V	alternating activity	4	5
V_iR_i	alternating achievement	6	5
vV_iR_i	transitive achievement	42	44
$v_iV_iR_i$	intransitive achievement	6	4

Table 4.10: Class membership of single-class denominal verbs and verbs from verbal roots. Asterisk indicates significance (χ^2 test, $p < 0.05$).

speakers' minds with particular event schemas than verbal roots are, and that denominal verbs may therefore show more variability in their argument structure. I tested whether membership in the nominal or verbal root population predicts how many Ramchand classes a root occurs in. The results are shown in Table 4.11.

There does not appear to be a strong effect, since most verbs occur in either one or two Ramchand classes, and there is no significant difference between the two verb populations. There are significantly more denominal verbs than verbs from verbal roots that appear in three Ramchand classes, however, which provides limited support for the hypothesis. If the categories for three, four, and five Ramchand classes are grouped into a “3 or more” category, the difference is still significant. The overall similarity of the distributions in Table 4.11 also agrees with the general similarity of the class distributions in Table 4.6.

I speculate that some Ramchand classes – probably vV_iR_i and vV, representing the common location, locatum, goal, and instrumental denominals – are so frequent for denominal verbs that new coinages are drawn to these classes by a process of analogy, thus limiting the flexibility for the new verbs occur in multiple frames; verifying this would require further experimentation.

Number of Ramchand classes	V	N
1	107	100
2	99	86
3	28*	45*
4	12	17
5	4	2

Table 4.11: Number of Ramchand classes per root. For example, 107 of the 250 verbal roots occurred in only 1 Ramchand class, compared to 100 of the 250 nominal roots. Asterisk indicates significance (χ^2 test, $p < 0.05$).

4.4.5 Experiment 5: Other constructional elements

This final experiment tests the likelihood that denominal verbs and verbs from verbal roots will appear with other constructional elements in the sentence. When considering why denominal verbs appear more often as transitives, one hypothesis is that the presence of the direct object helps the hearer to narrow down the possible meanings of the denominal verb (at least when it is a new coinage). If this is the case, then perhaps other constructional elements such as PPs, particles, the X’s way construction, etc. can serve the same purpose for denominal verbs, by narrowing down the event schema for the listener. This experiment, therefore, tests whether membership in the denominal verb or verb from verbal root population predicts the probability of a verb occurring in a simple frame or one with additional elements, by measuring the token frequencies of the constructional elements with verbs from the two populations. The results are shown in Table 4.12 for all examples, and in Table 4.13 for intransitive examples only, which by hypothesis should be even more likely to benefit from additional cues that the hearer can use when interpreting the meaning of the verb.

Looking first at Table 4.12, a crucial piece of data is in the first row, which shows the likelihood of “simple” examples: simple transitives, intransitives, or ditransitives with no other arguments or adjuncts. There is no significant difference between the nominal

and verbal root examples, so overall, denominal verbs are just as likely to appear in simple frames as verbs from verbal roots are. Looking at the following rows, there are several significant differences in how the two populations behave with regard to some of the more complex constructions. Verbal roots appear significantly more frequently with path PPs, while nominal roots appear significantly more frequently with obligatory and highly selected PPs; however, there is no significant difference in PPs overall, as seen in the fourth row, so the differences are only in whether the PPs are obligatory or optional. Nominal roots appear significantly more frequently with particles, resultative adjectives, and in the *Vs it (up)* construction, while verbal roots appear significantly more frequently with clausal complements.

The picture is somewhat different for intransitives, as seen in Table 4.13. The first row shows that denominal verbs are significantly less likely to appear in simple frames than verbs from verbal roots are: this supports the notion that intransitive denominal verbs, uniquely among denominals, are more difficult to interpret and require “support” from other sentential elements which can help the hearer identify the event schema. Nominal and verbal roots do not show significant differences with regard to PPs. However, nominal roots occur significantly more frequently with particles and resultative adjectives, which is also consistent with Table 4.12.

Taking the results in Tables 4.12 and 4.13 together, it appears that denominal verbs in general appear significantly more frequently with particles and resultative adjectives than verbs from verbal roots do, and that intransitive denominal verbs in particular are significantly less likely to appear in a simple frame.

4.5 Conclusions

This chapter has presented a corpus study which supports two major claims from Chapter 3. First, using Ramchand classes as the core argument/event structure classes for

Construction	V	(%)	N	(%)
Simple	1939	(57.0)	1852	(56.1)
Path PP	613*	(18.0)	512*	(15.5)
Arg PP	451*	(13.3)	497*	(15.0)
Any PP (Path+Arg)	1064	(31.3)	1009	(30.5)
Particle	114*	(3.3)	304*	(9.2)
Adjective	39*	(1.1)	79*	(2.4)
X's way	12	(0.4)	13	(0.4)
V's it (up)	4*	(0.1)	17*	(0.5)
Clausal	254*	(7.5)	89*	(2.7)

Table 4.12: Number and percentage of all examples occurring in different constructions. Total examples: 3,403 for V; 3,303 for N. A sentence may be counted twice if it has more than one element, e.g. a particle and a path PP. Clausal complements include quotatives. Asterisk indicates significance (χ^2 test, $p < 0.05$).

Construction	V	(%)	N	(%)
Simple	679*	(49.1)	400*	(41.4)
Path PP	338	(24.5)	242	(25.1)
Arg PP	343	(24.8)	239	(24.7)
Any PP (Path+Arg)	681	(49.3)	481	(49.8)
Particle	20*	(1.4)	90*	(9.3)
Adjective	9*	(0.7)	37*	(3.8)

Table 4.13: Number and percentage of **intransitive** examples occurring in different constructions. Total = 1382 intransitive examples for V; 966 for N. A sentence may be counted twice if it has more than one element, e.g. a particle and a path PP. Asterisk indicates significance (χ^2 test, $p < 0.05$).

verbs, I found that there is no verb class which nominal roots cannot appear in, with the possible exception of statives, which I attribute to statives being a relatively closed class. The distributions of denominal verbs and verbs from verbal roots across Ramchand classes was quite similar overall, except for significant differences in transitive lexicalizations.

Second, there is good evidence for a transitivity bias in denominal verbs. Nominal roots have a significantly higher probability of belonging to transitive classes than verbal roots do, and even when they are attested in intransitive classes, they have significantly lower token frequency in these classes. Among roots that belong to only a single Ramchand class, denominal verbs are significantly less likely to be intransitive, suggesting that in the early stages of conversion an intransitive usage is less likely. Denominal verbs have a significantly higher likelihood of appearing in three or more Ramchand classes, providing limited support for the idea that nominal roots are more flexible in their argument structure when used as verbs than verbal roots are. Finally, denominal verbs in general do not require more “support” from constructional elements such as PPs and particles, but intransitive denominal verbs in particular do, and they appear significantly more often with particles and resultative adjectives, rather than PPs.

In future work it would be beneficial to study a corpus of more recently coined denominal verbs, to discover whether any of these effects are amplified.

DENOMINAL VERBS AND EVENT PREDICATION

5.1 Introduction

This chapter undertakes an in-depth investigation of the semantics of English denominal verbs with no overt derivational morphology, which for simplicity I will refer to as *denominal verbs*. I propose that the nominal root in a denominal verb is (syntactically) adjoined to the subeventual heads in sublexical event structure by a process of lexical subordination, and (semantically) interpreted as an event predicate, i.e. it picks out a set of events, the same way verbal roots do when adjoined to subeventual heads in sublexical event structure. Despite the fact that nominal roots typically describe individuals, the nominal root in an English denominal verb is not involved in the introduction of any event participants. Specifically, it is not incorporated from argument position into a null verbal head, at least not the way the incorporation process is typically represented in previous literature (Hale and Keyser, 1993; Harley, 2005); nor are any argument positions introduced by the nominal's telic role.

I begin by looking at the well-known Canonical Use Constraint (CUC; Kiparsky, 1997): the idea that a verb formed from a noun must involve a canonical use of that noun. The CUC has been invoked to account for how speakers know that *saddling a horse* involves putting the saddle onto the horse, while *caging a tiger* involves bringing

the tiger into the cage; and that *powdering one's nose* means putting powder on, while *dusting the shelf* means taking dust off. I review several types of evidence showing that the canonical use reading is always subordinate to the argument structure of the denominal verb, and that argument roles cannot be added to the verb even when the nominal holds that role in the argument structure template of its canonical event. A reformulated CUC reflects this constraint.

I then present evidence that a nominal root in a denominal verb does not introduce an event participant. The failure of the nominal root to introduce a discourse referent that supports anaphora is well-known (Harley, 2008), and unsurprising since no DP functional structure is present in the denominal verb. However, some previous syntactic analyses assume that there is such a participant in sublexical syntax, despite being opaque for anaphora, i.e. that a *shelving* event must involve some participant which is either a shelf, or similar to a shelf. I show that this is not necessary, with examples like (117), where there is no event participant which could properly be considered a skate. I present a number of examples from various denominal verb subclasses indicating that cases where the nominal does not introduce a participant are much more widespread than previously believed. In examples where it appears that a participant is introduced, I propose that this is an implication and not a true syntactic or semantic argument.

- (117) But in the desert it gives a strange moaning sound, low and sensual, accompanied by the singing of the sand as it skates across itself. (BNC)

I next look briefly at nameworthiness effects, noting that such effects are relevant for denominal verbs, as they are for many other constructions involving bare nouns, such as (semantic) incorporation and compounding. I argue, however, that nameworthiness effects cannot account for the infelicitous intransitive denominal verb readings, since there are equally non-nameworthy transitive denominal verbs which are nevertheless lexicalized. I consider the locus of nameworthiness effects in N-V compounds compared

to denominal verbs, suggesting that differences in these two phenomena support the analysis of nominal roots as event predicates, not arguments, in denominal verbs.

Finally, I make the additional point that according to my proposal, semantic hierarchy effects – the idea that given a set of arguments, it is the one lowest in the semantic hierarchy which is realized as the denominal verb – are an epi-phenomenon.

As throughout the dissertation, verbs are considered denominal according to the criterion of historical precedence, that is, whether they came into the language first as nouns, with the decision based on CELEX (Baayen et al., 1995) or the Oxford English Dictionary. Naturalistic data is used whenever possible, from the BNC or the WWW. Throughout, I make the basic assumption that it is desirable to have a unified syntactic and semantic analysis for different semantic classes of denominal verbs, including what have been called location/locatum verbs, goal verbs, and instrument verbs, unless there is a strong reason to do otherwise, contra previous analysis that divide them into different syntactic processes (e.g. Harley, 2005).

5.2 Background, Framework, and Proposal

In this section I review some background information about the framework in which I present my proposal, based on the previous chapters.

Two major approaches to denominal verbs, incorporation and underspecification, are discussed in Chapter 2. My approach is consistent with the general idea of underspecification, in which roots contribute idiosyncratic meaning while functional syntactic material is responsible for subeventual and argument structure, although unlike some underspecification theories I assume roots have semantic type (see Section 3.2.1). I also assume an articulated VP in which subevents are represented by separate projections, as in Ramchand (2008) (Figure 5.1); see Section 3.4 for an overview.

My proposal for English denominal conversion verbs is given in (118). It falls under

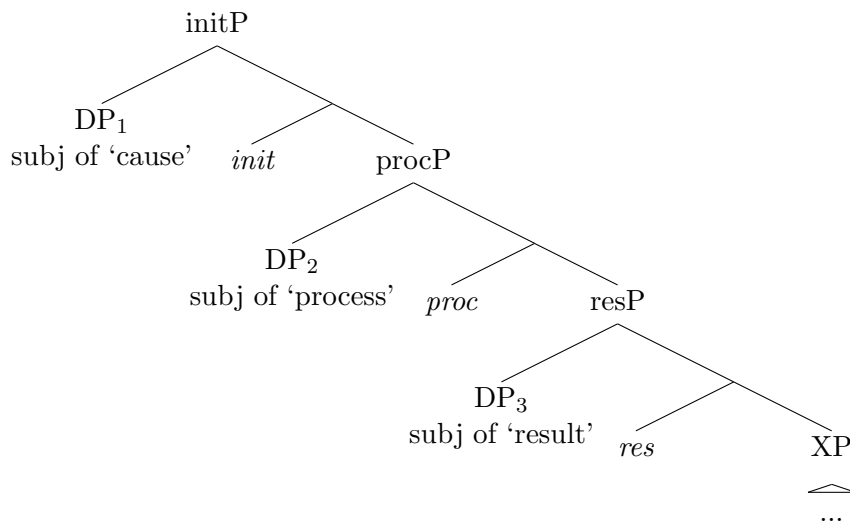


Figure 5.1: Functional sequence for event decomposition in Ramchand (2008).

the general umbrella of lexical subordination analyses (Levin and Rapoport, 1988; Jackendoff, 1998; McIntyre, 2004; Mateu, 2002, 2008; Borer, 2005a,b; Ramchand, 2008; den Dikken, 2010), in which an element supplying idiosyncratic information – in this case a nominal root – is “plugged in” to the event structure supplied by the syntax. Meaning is negotiated between the event/argument structure and the idiosyncratic meaning of the root; in general, the syntax dominates the negotiation and coerces the root to an appropriate sense. This idea is contrary to lexicalist theories that project argument structure from lexical items. The root can, however, assert some selectional preferences as well, as certain roots may resist occurring in certain structures.

(118) Proposal:

- The subeventual and argument structure of a denominal verb are determined by syntax, including the surface arguments of the verb and any relevant modifiers (e.g. a path PP). Where the observed syntax underdetermines the subeventual structure – for example, with regard to telicity – world knowledge and context contribute to

the interpretation.

- World knowledge includes information about canonical event types associated with nominals. However, the canonical event interpretation must be chosen, from the set of possible canonical event interpretations associated with a particular nominal, so as to be consistent with the syntax and the context. The canonical event type contributes no argument structure of its own. This is formulated as a revised CUC in Section 5.3.6.
- The nominal root is adjoined to the head(s) of a verbal subeventual skeleton via lexical subordination (Levin and Rapoport, 1988). Semantically, the nominal root is interpreted as an event predicate, as are verbal roots in the same position. In the framework of Ramchand (2008), the nominal root never occupies a specifier position; from a more general point of view, it never fills a syntactic argument position. As a corollary, there is no incorporation involved, at least as incorporation in denominal verbs is presently understood.

Syntactically, I assume that roots are head-level adjuncts as in Mateu (2002, 2008), McIntyre (2004), but this is not essential to the discussion in this chapter; the key is that nominal roots use the same mechanism available to verbal roots for combining with subeventual heads.

Semantically, the idiosyncratic element in lexical subordination is predicated of an event variable in (neo-)Davidsonian event semantics, for example *saddle* in (119) (see Section 3.6 for a discussion). This interpretation is consistent with the approach of Ramchand (2008), which makes use of a neo-Davidsonian representation. In my view, there is no fundamental difference between verbal and nominal roots in that when they are adjoined to a verbal head(s), they *must* be interpreted as event predicates. The difference between nominal and verbal roots is a semantic and/or pragmatic one: the nominal root must be coerced to an appropriate sense, if there is not already an estab-

lished sense in which it picks out a set of events, and this coercion is accomplished with the aid of the argument structure in the sentence.

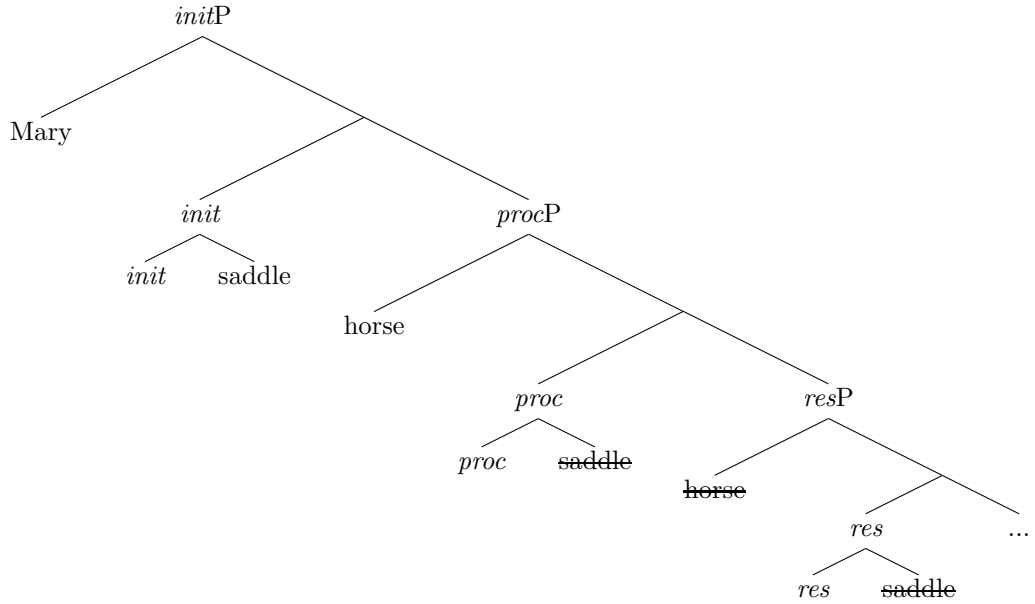
(119) saddle: $\lambda x \lambda y \lambda e . \text{saddle}'(e) \ \& \ \text{agent}(e, x) \ \& \ \text{patient}(e, y)$

When an event is decomposed into subeventual structure, the root – whether verbal or nominal – is a predicate of one or more subevents. For Ramchand, the root (which for her is only a verbal root, but I argue can be a nominal root as well) participates in multiple merge with the subeventual heads. For example, a verb like *defuse* is argued to have the projections *initP* (vP), *procP* (VP), and *resP* (RP), and the root modifies all of them. I propose that nominal roots behave the same way.

A schematic of my proposal is in (120) for transitive change of state verbs and (121) for unergatives, with the subevents *initiation*, *process*, and *result* as in Ramchand (2008). Note in (120) and (121) that the nominal roots are predicated of subeventual heads directly, not of individual arguments. Strikethroughs indicate unpronounced copies of a root that has undergone multiple merge with subevent heads, as well as unpronounced specifiers when specifiers of the different subevents are co-indexed (see Section 3.4.2). The symbol \rightarrow represents the causation relation between subevents.

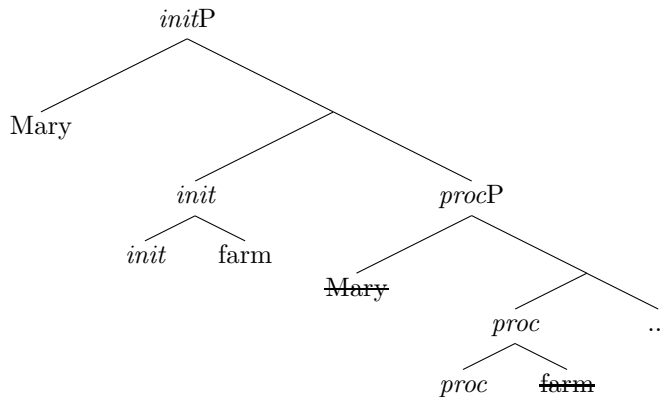
(120) Transitive change of state: Mary saddled the horse.

$\lambda x \lambda y \lambda z \lambda e \exists e_1, e_2, e_3 [\text{State}(e_1) \ \& \ \text{Process}(e_2) \ \& \ \text{State}(e_3) \ \& \ e = e_1 \rightarrow e_2 \rightarrow e_3$
 $\& \ \text{saddle}(e_1) \ \& \ \text{saddle}(e_2) \ \& \ \text{saddle}(e_3) \ \& \ \text{Subj}(e_1, x) \ \& \ \text{Subj}(e_2, y) \ \& \ \text{Subj}(e_3, z) \ \&$
 $\text{Mary}(x) \ \& \ \text{horse}(y) \ \& \ \text{horse}(z)]$



(121) Unergative: Mary farmed.

$\lambda x \lambda y \lambda e \exists e_1, e_2 [\text{State}(e_1) \ \& \ \text{Process}(e_2) \ \& \ e = e_1 \rightarrow e_2 \ \& \ \text{farm}(e_1) \ \& \ \text{farm}(e_2)$
 $\& \ \text{Subj}(e_1, x) \ \& \ \text{Subj}(e_2, y) \ \& \ \text{Mary}(x) \ \& \ \text{Mary}(y)]$



Lexical subordination analyses have previously been proposed for some subclasses of denominal verbs. For example, Harley (2005) proposes the operation of “manner incorporation” – essentially lexical subordination – for instrument verbs only, whereas I propose that all denominal verbs are formed by lexical subordination.

I also adopt the analysis of Mateu (2001) in which all change of state denominal verbs, including locatum, location, and goal verbs in the terminology of Clark and Clark (1979), have the same syntactic structure, which is that of (120).

5.3 The Canonical Use Constraint

The notion that denominal verb uses of a noun involve a “canonical use” of that noun is both attractive and persistent. In section 5.3.1 I will discuss the background of this idea. I then proceed to show that the canonical use interpretation is always mediated by overt syntax. Section 5.3.2 reviews evidence showing that context, both linguistic (argument structure) and extra-linguistic, overrides canonical use readings. Section 5.3.3 looks at cases where the canonical use of the noun is a so-called *direct telic role* (Pustejovsky, 1995), i.e. it is a patient or incremental theme. Using these examples, and comparing them with other classes of denominal verbs such as instrumentals, I show that the canonical event type does not contribute any argument structure itself, but rather emerges only when it is consistent with surface argument structure. Section 5.3.4 investigates how the Canonical Use Constraint could be formalized with the Generative Lexicon of Pustejovsky (1995), highlighting some problems in how causative meaning is supposed to emerge in denominal verbs. Finally, Section 5.3.5 provides the first detailed look at canonical uses across a wide variety of denominal verb types, showing that the canonical readings that do emerge tend to fall into one particular pattern out of all the options available, again conditioned by surface argument structure.

5.3.1 Background

The idea that the meaning of a denominal verb is related to the canonical use of the source nominal dates back at least to Green (1974), who formulates a constraint with regard to instrument verbs. She observes that “instrument verbs cannot be used to describe ‘non-standard’ uses of instruments, methods, etc.; one cannot say, for example, *Joe radioed us the message* if he mailed us the message taped to a radio, or *Joe hammered the nail in* if he got it in by placing a hammer on it and leaning on the hammer to get it in” (221). Green’s semantic representation for instrumental denominal verbs is in (122), with an example interpretation in (123).

(122) ‘(AS) BY USING NP (ON) in the usual manner, for the purpose for which it was designed or adopted’

(123) He hammered the nail in with a shoe.
‘by using a shoe on the nail, as by using a hammer in the usual manner, he caused the nail to go in’

Green’s formulation does not assert that an actual hammer is involved; she notes that this would be incorrect, since sentences like those in (124) do not require a literal hammer or pins. (I pursue this matter in section 5.4). She also acknowledges that multiple event types may be considered “standard” uses of the noun in context, hence the “designed or adopted” formulation, which covers cases like (125).

(124) a. He’s been hammering on it all morning.
b. She pinned him to the floor.
(Green, 1974, p.165)

(125) a. We thumbed through the books.
b. We thumbed to New York.
(Green, 1974, p.221)

Though the role of canonical uses has been taken up by others, its strongest expression has been that of Kiparsky (1997) who used it to argue for the role of lexical-conceptual information in denominal verbs, against the “syntax-only” approach of Hale and Keyser (1993, 1997a). Kiparsky focused on a problematic prediction in Hale and Keyser’s proposal, represented in Figure 5.2 (repeated from Figure 2.2). The problem arises from the fact that Hale and Keyser propose two abstract prepositions within the same basic syntactic structure. The preposition of terminal coincidence derives location verbs, while the preposition of central coincidence derives locatum verbs. Hale and Keyser point out that, structurally, the infelicitous sentence *#Jill horsed the corral* cannot be derived from the tree in Figure 5.2 (a), because it would mean incorporating *horse* into the preposition from a specifier position. However, the structure in Figure 5.2 (c), with the preposition of central coincidence and the nouns in reversed positions, does allow this sentence to be derived; moreover, the meaning of the central coincidence relation should allow this as a reasonable representation of the situation where the horse is put into the corral. The reverse situation holds for the infelicitous sentence *#Jill housed the paint*, with the good sentence derived in Figure 5.2 (d) and the infelicitous one in Figure 5.2 (b). Essentially, the incorporation structure generates twice as many location/locatum verbs as it should, unless further constraints are applied.

Kiparsky proposes such a constraint, noting that speakers can reliably associate a nominal with the structure it belongs in, depending on whether the nominal denotes the type of thing that one typically puts *on* other objects, or puts other objects *in*. If the nominal could have either use, e.g. *ice* (‘to put ice on something’, ‘to put something on ice’) or *index* (‘to provide something with an index’, ‘to put something into an index’), the denominal verb can have both meanings.

Kiparsky also echoes Green’s observation about speakers’ knowledge of the typical ways in which things are done, attributing this also to the influence of lexical-conceptual structure on the interpretation of denominal verbs. “For example, [*saddling a horse*] does

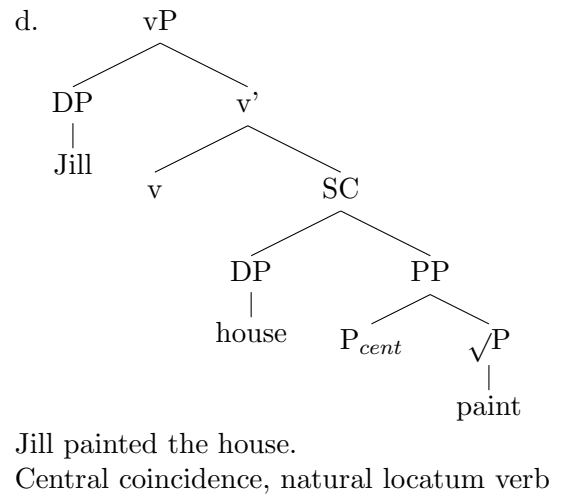
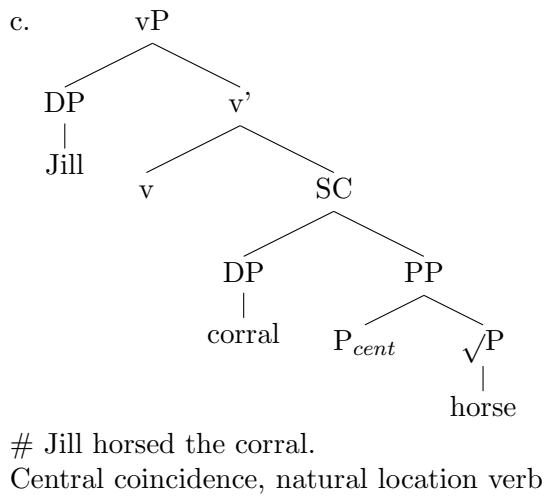
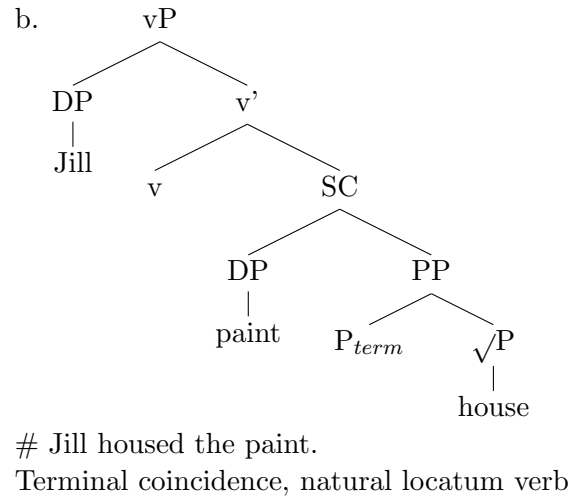
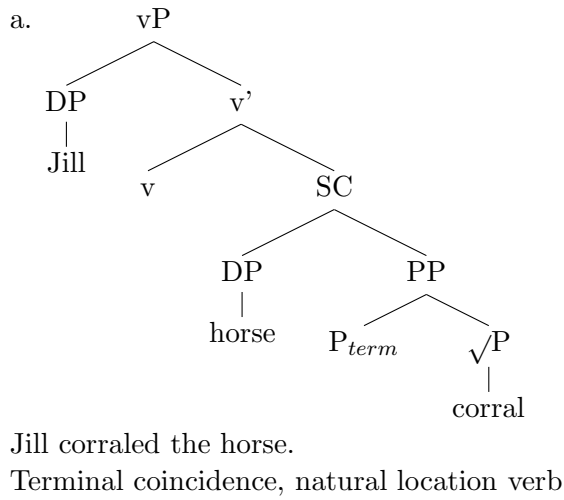


Figure 5.2: Overgeneration of location/locatum verbs in Hale and Keyser (1993) as pointed out by Kiparsky (1997).

not felicitously describe putting a saddle into a basket on the horse's back, or putting it on the wrong part of the horse's anatomy." *Taping* can mean 'tape a poster to a wall' or 'tape a movie', but *tape some papers* cannot mean 'using a roll of tape as a paperweight', nor *tape a person* 'use a piece of tape to strangle the person'.

Based on native speakers' apparent intuition for these constraints on denominal verb meaning, Kiparsky argues for a lexical-conceptual level of representation that influences lexicalization. He does not provide an alternative syntax – in fact, his semantic analysis corresponds quite closely with Hale and Keyser's syntax, with two relational templates corresponding to terminal and central coincidence – but rather a realization rule which links roots to syntactic/semantic templates (126).

(126) **Kiparsky's Canonical Use Constraint (CUC)**. If an action is named after a thing, it involves a canonical use of the thing.

Some further work has addressed Kiparsky's observations within the general incorporation program. Mateu (2001) tackles the problem of the double generation of location/locatum verbs by proposing that there is only a single abstract preposition for both location and locatum denominal verbs, and indeed for goal verbs (e.g. *braid*, *powder*) as well. Mateu proposes that all telic change of state denominal verbs involve a terminal coincidence relation, thus having the structure in Figure 5.2 (a), and follows Labelle (1992) in the idea that the source nominal describes the end state of the denominal verb, where the end state could be the result of any change of state. Mateu's proposal accounts for Kiparsky's observation on location/locatum verbs; with only a single syntactic structure, there is no need for a rule linking nominals to structures, and we can assume that the canonical use reading associated with the source nominal emerges as a matter of pragmatics.

Harley (2008) proposes that the CUC may not be independently needed for denominal verbs, since the emergence of canonical use readings may be a function of bare nouns,

regardless of the construction they occur in. Harley points out that bare nominals receive canonical interpretations in many other contexts such as PPs (where *in jail*, *at school* mean being in those institutions for their typical purpose) and semantic incorporation. Incorporation, in fact, requires a bare noun, so if denominal verbs are formed by incorporation, and the bare noun is the source of the CUC, then denominal verbs are merely consistent with other linguistic constructions in this respect. See also Mateu (2009); Espinal and Mateu (2011) for variants of this view. Effectively, Harley’s proposal suggests a locus for the canonical use effect that Kiparsky notes.

The work mentioned here goes a long way towards showing how the CUC could be integrated with incorporation approaches to denominal verbs. However, work to date on the syntax and semantics of denominal verbs has mostly taken the CUC at face value. In the next sections I undertake a more comprehensive investigation across a range of denominal verbs, showing that the CUC does not always hold, and that it can only hold when the argument structure of the canonical use is consistent with the syntax of the denominal verb.

We must first make a small change in our terminology to generalize the discussion. The formulation “canonical use” is not appropriate for all nouns, since many do not have canonical “uses” per se. For example, animal verbs like *dog* and *monkey (around)* do not refer to “uses” of those animals, but rather actions that the animals may be thought to typically perform. This is not a fundamental problem, however, since the notion of “canonical use” can be broadened to “canonical event type”, which allows us to generalize to the animal verbs as well as role and profession denominal verbs such as *witness* and *waitress*.

I will also assume that any given noun is capable of having multiple canonical event types associated with it. This makes it possible to accommodate situations where different event types are highlighted in different linguistic or non-linguistic contexts.

5.3.2 Non-canonical event types readily available

Although this point is almost trivial, it is worth remembering that non-canonical event types are readily available as interpretations of denominal verbs. Context, both extra-linguistic and linguistic, can easily dictate a non-canonical meaning. This is true even for denominal verbs that are already well-established.

Clark and Clark (1979) give a number of examples of idiosyncratic denotations, some of which are shown in (127) and (128). The examples in (127), attested in news media, are cases where non-linguistic context influences the interpretation of the denominal verb. The syntactic frame in which the verb is found is clearly also an influence; for example, in (127b) the verb must be a causative, and in (127) and (128) the verb must be interpreted in a way consistent with having a direct object.

- (127) a. We were stoned and bottled by the spectators as we marched down the street.
- b. celluloid the door open
'use a credit card to spring the lock open'
(Clark and Clark, 1979)

- (128) Imagine that Ed and Joe have an odd mutual acquaintance, Max, who occasionally sneaks up and strokes the back of people's legs with a teapot. One day Ed tells Joe, *Well, this time Max has gone too far. He tried to teapot a policeman.*
(Clark and Clark, 1979)

The teapot example (128) demonstrates that speakers seem very willing to accommodate interpretations that are presumed to be mutually intelligible to the interlocutors. I have also found that informants are willing to accept denominal verbs when context makes it clear that the verb refers to a mutually intelligible activity, for example, in

a context involving co-workers at a job. I have found informants much more ready to accept (130) than (129), despite (129) being the canonical event reading.

(129) #I've been necktie-ing. (intended reading: wearing a necktie)

(130) You and your colleague work in a garment factory. On any given day you may be making gloves, socks, or neckties. At the end of the day, your colleague asks: What have you been doing today?

Answer: I've been necktie-ing.

Similarly, if the interlocutors are attending a carnival where there are various silly competitions, one of which is to determine the person who can keep a spoon stuck to their nose the longest, it would be reasonable to say (131).

(131) Q: Where's Mary?

A: Oh, she's over there spooning at the moment.

It could be argued that the unusual readings of *teapot*, *necktie*, and *spoon* in these examples are canonical within the situational context, but this is not really the type of canonical reading intended by the CUC.

It was observed in Section 3.2.2 that nouns whose canonical use is as an incremental theme are infelicitous as intransitive denominal verbs. But the same nouns can be used more felicitously with frames other than the intransitive (132), which demonstrates syntactic context overriding the canonical event reading.

- (132) a. Mary appled the room.
 ‘decorated the room with apples’
- b. Mary appled Susan.
 ‘hit Susan with apples, gave Susan apples’
- c. The audience appled the performers off the stage.
 ‘caused the performers to leave the stage by throwing apples’
- d. Mary appled into the room.
 ‘entered the room in such a way that apples were salient in her manner of
 motion: maybe juggling them or walking on them’

Moreover, some nouns, including some of the patient and resultee nouns which resist the canonical interpretation (see Chapter 3 and Section 5.3.3), have well-established (if colloquial) denominal verbs with non-canonical meanings. Some examples are *ball* ‘to have sex (with)’ (though cf. also *ball up*), *spoon* ‘to hug like interlocked spoons’, *ladder* (British) ‘get a run (in tights or stockings)’, *beef* ‘complain’, *sack* ‘fire from a job’, *bomb* ‘fail’. I leave a systematic study of such examples for future work, but they certainly show that the canonical event type is not the only reading available for denominal verbs.

Some nouns are not necessarily associated with a canonical event type. Some animals and proper names fall into this category, as do several nouns from the corpus study in Chapter 4, e.g. *chance*, *silhouette*, *chart*, *test*, *freight*. Yet that does not make such nouns ineligible to form denominal verbs. Sometimes a noun has more than one canonical event type; for example, *saddle* could be associated with riding on a saddle as well as putting a saddle on, but not all of its canonical event types are equally likely to be lexicalized; see Section 5.3.5.

Kaschak and Glenberg (2000) provide experimental evidence for the salience of non-canonical event types in context. For example, they use the verb *crutch* in a context where it means ‘push something to someone using a crutch’, and find that the property of a crutch being long and thin is more salient to experimental subjects than its property

of being useful when one is injured.

From these examples we see that canonical event types can be a default reading for denominal verbs under the right circumstances, but are far from being the only possible reading, as Kiparsky's CUC implies they are.

5.3.3 Infelicitous canonical event types for intransitive denominal verbs

The constraint on theme (133), patient (134), resultee (135), and initiator (136) readings of intransitive denominal verbs, which has been discussed in Chapter 3, poses a different challenge for the CUC, since the missing readings are in fact canonical event types for the source nominals.

- (133) a. #Mary was applying at lunch today.
intended: 'eating apple(s)' (consumption)
- b. #Susan was beering a lot last week.
intended: 'drinking beer' (consumption)
- c. #Pat was booking all afternoon.
intended: 'reading/writing book(s)' (consumption/creation)
- d. #Julie was housing last year.
intended: 'building house(s)' (creation)
- (134) a. #Mary was balling on the playground.
intended: 'throwing ball(s)'
- b. #Susan was shirting when I saw her.
intended: 'wearing a shirt'
- c. #Pat was catting.
intended: 'petting/feeding/etc. a cat'
- d. #Julie was babying.
intended: 'feeding/holding/etc. a baby'

- (135) a. #The children piñataed at the end of the party.
 intended: ‘broke a piñata’
- b. #Susan had been windowing to let some air into the room.
 intended: ‘opening a window’
- c. #The expert was bombing when I entered the room.
 intended: ‘defusing a bomb’
- (136) a. # Mary was mosquito-ing all night.
 intended: ‘mosquitoes were biting Mary’
- b. # The town tornadoed to the ground.
 intended: ‘a tornado brought the town to the ground’
 (A. Marantz pc)

The fact that, for any given nominal, there is some canonical event type which is not lexicalized by a denominal verb is not in itself a point against the CUC. As Kiparsky says, “Note that the claim is that all meanings of denominal verbs reflect canonical uses of the things denoted by the noun, not conversely that all canonical uses of the things denoted by the noun are reflected in the meanings of denominal verbs. For example, *to water* may mean to irrigate with, to dilute with, or to supply with water, but not to extinguish (a fire) with water” (9). However, the constraints represented in (133) through (136) do not seem to have this idiosyncratic character. Rather, there are systematic gaps in the kinds of canonical event types which arise as meanings of denominal verbs, and this bears investigation.

In particular, I am concerned with data such as (137). There is a clear three-way distinction between different classes of denominal verbs. In (137a), the canonical use of a *rake* is readily available for the meaning of the denominal verb. In (137b), there still seems to be a canonical activity involved, but supposing that ‘being on a horse’ – rather than ‘being *put* on a horse’ – is the canonical use of a saddle, there is some mystery

as to how the causative component of the denominal verb reading originates. Finally, in (137c), the denominal verb is infelicitous despite the intended ‘eating’ reading being precisely the canonical activity associated with an apple.

- (137) a. Mary raked the leaves.
b. Mary saddled the horse.
c. # Mary appled.

I will discuss this three-way distinction further in Sections 5.3.4 and 5.3.5.

5.3.4 Formalizing the CUC with Pustejovsky’s Generative Lexicon

So far we have relied on an intuitive notion of canonical event types. Kiparsky does not give an explicit definition of canonical use, only paraphrasing it as a “conventional, generic” use (p.9). One obvious way to formalize the notion is to use the qualia structures proposed by Pustejovsky (1995). In this section I review Pustejovsky’s framework and discuss some previous and potential approaches to formalizing the CUC.

Pustejovsky proposes four qualia, or roles, associated with a noun: formal, constitutive, telic, and agentive. Each role comes into play in various syntactic contexts; see Pustejovsky (1995) for a full explication. Examples of the qualia structure for *novel* and *car* are given in (138) and (139), respectively.¹ The qualia are defined as follows. The CONSTITUTIVE quale describes the relation between an object and its constituent parts. The FORMAL quale describes that which distinguishes it within a larger domain. The TELIC quale describes its purpose and function, and the AGENTIVE quale describes factors involved in its origin.

¹The example qualia structures in this and the following sections are adaptations of examples from Pustejovsky (1995), unless otherwise noted.

(138) **novel**

$$\left[\begin{array}{l} \text{FORMAL} = \text{book}(x) \\ \text{CONST} = \text{narrative}(w) \\ \text{AGENT} = \text{write}(e, z, x) \\ \text{TELIC} = \text{read}(e, y, x) \end{array} \right]$$

(139) **car**

$$\left[\begin{array}{l} \text{FORMAL} = \text{vehicle}(x) \\ \text{AGENT} = \text{create}(e, z, x) \\ \text{TELIC} = \text{drive}(e, y, x) \end{array} \right]$$

The two qualia that we are particularly interested in as having potential importance for verbal uses of the nominal roots are the agentive and telic qualia, since these are the ones that describe events. The telic quale in particular is the one which most directly corresponds to ‘canonical use’. Note that the qualia roles include an argument structure template, which is used by Pustejovsky for various semantic composition and coercion operations; I will make use of the argument structure template as well.

Though it is not often discussed in subsequent literature that uses qualia structure, Pustejovsky defines two “modes”, or subclasses, of telic role: direct telic and purpose telic. The direct telic role is defined as “something which one acts on directly”, and corresponds to a direct object; while the purpose telic role is defined as “something which is used for facilitating a particular activity”, and corresponds to an instrument (p.99). A noun will typically have one or the other, but not both. Examples of direct telic and purpose telic roles are given in (140) and (141), respectively. Note that the variable x , representing the noun, is the object in the telic role for *beer* but the actor in the telic role for *knife*.

$$(140) \quad \mathbf{beer} \quad \left[\begin{array}{l} \text{FORMAL} = x \\ \text{TELIC} = \text{drink}(e, y, x) \end{array} \right]$$

$$(141) \quad \mathbf{knife} \quad \left[\begin{array}{l} \text{FORMAL} = x \\ \text{TELIC} = \text{cut}(e, x, y) \end{array} \right]$$

The telic role comes into play in a variety of grammatical constructions. One of these is complement coercion, where the direct telic role is the natural reading of the object nominal when it is coerced to an event interpretation: *begin the book* is interpreted as ‘begin reading/writing the book’. The telic role also emerges under adjectival modification with a certain set of adjectives. For example, a *fast car* is fast for driving, while a *good screwdriver*, *good hammer*, and *good rake* are good for their intended purposes. For nominals with direct telic roles, the telic role also seems to emerge under adjectival modification: drinking, eating, or reading for a *good beer*, *good cake*, and *good novel*, respectively (as opposed to, say, the novel making a good paperweight). This phenomenon is described by Pustejovsky (1995, p.129) under the label of “selective binding”.

Pustejovsky (and subsequent literature) discuss only a small number of examples of direct telic roles, namely those that participate in complement coercion, which – due to the aspectual properties required for complement coercion – are generally incremental theme roles. However, it should be possible for patient roles to be direct telic roles as well when some action is highly associated with a particular patient, as in (142) or (143).

$$(142) \quad \mathbf{ball} \quad \left[\begin{array}{l} \text{FORMAL} = x \\ \text{TELIC} = \text{throw}(e, y, x) \end{array} \right]$$

(143) **shirt**

$$\left[\begin{array}{l} \text{FORMAL} = x \\ \text{TELIC} = \text{wear}(e, y, x) \end{array} \right]$$

In order to use the qualia structure to formalize the meaning of denominal verbs, let us start with the simplest case, those of instrumental verbs. We have seen that this is the class of verbs for which the canonical use is perhaps most transparently related to the denominal verb meaning (137). Instrument nouns such as *rake*, *hammer*, and *tape* have purpose telic roles. For the sentence in (144a), we assume (see Section 3.5) that the surface subject and object represent the initiator and undergoer, and the source nominal *rake* contributes some additional information about the event, represented by the uppercase *RAKE* in (144b). We cannot simply use the argument structure template that is part of the telic role (144c) (where I use ‘scoop’ as a crude representation of the raking action), since the rake is the actor in this representation and there is no room for the surface subject. This is not too serious, as we could posit a modification of the telic role’s argument structure template to something like (144d). However, it does begin to raise the question of how the telic role unifies with the surface argument structure of the sentence.

- (144) a. Mary raked the leaves.
 b. $\lambda e[\text{RAKE}(e) \ \& \ \text{Init}(e)(\text{mary}) \ \& \ \text{Undergoer}(e)(\text{leaves})]$
 c. $\text{TELIC} = \text{scoop}(e, x, y)$, where $\text{rake}(x)$
 d. $\text{TELIC} = \text{scoop}(e, z, y) \ \& \ \text{using}(e, x)$, where $\text{rake}(x)$

This issue is brought more to the fore with location/locatum verbs. We have no guidance as to the definition of the telic role from Pustejovsky, since he does not provide examples such as *saddle* or *cage*. Kiparsky suggests that ‘putting x on something’ is a canonical use for nouns like *saddle*, and ‘putting something in x’ is a canonical use of

nouns like *cage*; i.e. he builds the full causative change of state meaning into his notion of canonical use. This would suggest a telic role like (145) for *saddle*.

(145) TELIC = cause(e, z, poss(y, x)), where saddle(x)

Volpe (2002) explicitly formulates telic roles in a similar way, encoding the causative or ‘putting’ subevent in the telic role. But in fact this is a somewhat unintuitive telic role for *saddle*; although putting a saddle on something – say a horse – is one activity associated with saddles, there are other potential event types that may be even more intuitively canonical, such as the state of the saddle being on the horse, or the act of riding the horse using the saddle. Moreover, the telic role with the embedded causative does not behave as expected in other contexts, such as adjectival modification: a *good saddle* is not good for putting on, but rather good for riding with.

Baeskow (2006) takes a different approach, treating the end state as the telic role. For example, her telic role for *bottle* is TELIC = hold(e, z, y: liquid). Conceptual knowledge then contributes the causative reading during the process of noun-to-verb conversion, and linking rules based on proto-agent and proto-patient properties (Dowty, 1991) determine how surface arguments link with the argument structure of the causative verb. This approach has the advantage of coinciding with more intuitive notions about the telic role, and also seems to interact with adjectival modification in a more expected way. However, the idea that the causative component is contributed by extra-linguistic conceptual knowledge, before any contribution from surface argument structure, is left rather vague and unsatisfying.

I also note that the distinction between purpose telic and direct telic roles seems to align quite closely with the distinction between canonical event types that tend to be encoded in denominal verbs and those that do not.

5.3.5 Empirical investigation

So far we have seen that for location and locatum verbs, a canonical event type seems to be involved, but only with respect to the assumption that there is a change of location or other change of state involved in the event. In this section I consider a wider variety of denominal verb types, paying special attention to the range of possible canonical event types for the noun, and what event type tends to be lexicalized. For convenience I use the traditional semantic classes such as location, locatum, goal, and instrument verbs. Most of the example verbs in this section are taken from the verb lists in Clark and Clark (1979) and Kiparsky (1997).

Let us start with locatum verbs (146), where a clear pattern emerges. Beds are typical *places* for blankets, but the typical *use* of blankets is not to be put on beds, but to keep people warm. To be sure, putting a blanket on a bed is a relatively ritualized activity, but it is only one of the possible event types associated with blankets; it is notable that we do not have *Mary blanketed* with the meaning ‘used a blanket to keep warm’.² Similarly, the canonical use of a carpet is not necessarily to be put on a floor, but rather the state of being on the floor, or even the activity of being walked on. Yet *Mary carpeted* is not normally an acceptable way of saying that she walked over the carpet.

(146) blanket the bed, carpet the floor, butter the bread, spice the food, diaper the baby, shoe the horse, jewel her hands, address the letter, saddle the horse, shroud the corpse

Continuing with the locatum examples in (146), bread is a typical location for butter, and food for spice, but the typical use of these things is surely to eat them. Babies are typical locations for diapers, but the use of diapers is as a vessel for waste. Horses

²Nor *Mary blanketed Sam* meaning ‘kept Sam warm with a blanket’, but this may be because it violates a principle of direct causation (Kiparsky, 1997).

are typical locations for shoes, but the typical use of shoes is to walk on them (or to protect the feet, but again, putting them on the feet is not *prima facie* the most typical action associated with shoes). Hands may be one of the typical places for jewels, but wearing them or showing them off may be more typical. Letters may be typical places for addresses, but again the typical use of an address might be using it to find a location. Horses are typical locations for saddles, but it seems that the typical use of a saddle is to sit on it while riding. Corpses are typical locations for shrouds, but what the shroud typically does is protect the corpse, not get put on the corpse.

Interestingly, the class of nominals which form locatum verbs includes nominals with both purpose telic and direct telic roles. For example, *blanket* has a purpose telic role (147), while *butter* has a direct telic role (148). Yet neither telic role is the one that emerges in the locatum verb context. This is exemplified by the fact that a *good blanket* is good for keeping one warm, not good to put on a bed; and a *good butter* is good to eat, not good to put on bread. Thus it appears that the necessity of having a change of state reading overrides the telic role of the nominal.

(147) **blanket**

$$\left[\begin{array}{l} \text{FORMAL} = x \\ \text{TELIC} = \text{keep} - \text{warm}(e, x, y) \end{array} \right]$$

(148) **butter**

$$\left[\begin{array}{l} \text{FORMAL} = x \\ \text{TELIC} = \text{eat}(e, y, x) \end{array} \right]$$

For each of the source nominals in (146), if we attempted to produce a denominal verb representing the telic role, we would produce an intransitive: *Mary buttered* ‘ate butter’, *Mary spiced* ‘ate spice(s)’, *the baby diapered* ‘used the diaper’, *the horse shoed* ‘wore/walked with shoes’, *Mary jeweled* ‘wore/showed off her jewels’, *Mary saddled* ‘rode with a saddle’. It would have to be an intransitive because in these situations – para-

phrased by ‘Mary used N in its typical fashion’ – the nominal root is used as the verb, and there is no other argument besides Mary to fill a surface argument position. But as we have seen in Section 5.3.3, intransitives are infelicitous when the noun is supposed to be an object; hence a less-canonical or non-canonical event type is lexicalized for these denominal verbs.

On the other hand, given a transitive surface structure such as *Mary saddled the horse* or *Mary buttered the bread*, the hearer can construe it as either atelic – so that the nominal root is modifying *procP*, which makes the verb an instrumental – or telic, involving a change of state. The instrumental reading is rather implausible, although if forced to construe it, we can, e.g. Mary hitting the horse with a saddle. Instead, we get the change of state reading, which is felicitous because the state of N being on the direct object (e.g. a saddle on a horse) is a reasonable end-state. Moreover, there is a set of fairly stereotypical actions associated with the change of state in the lexicalized cases, such as a rather stereotyped motion for putting butter on bread.³

The locatum examples we have looked at so far have very clear alternate canonical event types besides the change of state event: riding for *saddle*, keeping warm for *blanket*, eating for *butter* and *spice*. This helps to clarify the mediating role of the syntax in picking out one particular event type from the possible canonical event types. There are also locatum verbs which do not have such a clear alternative, such as *slipcover the cushion* – slipcovers don’t really have any particular use besides covering a cushion, although again the state of being on the cushion seems potentially more canonical than the act of putting it on – but the general principle should be clear.

We turn next to location verbs (149). As with the locatum verbs, it appears that the meaning lexicalized in the denominal verb is not the only or primary canonical event type associated with the noun. The ground may be a typical location to put planes onto,

³The role of these stereotypical actions is difficult to pin down. However, compare *Mary buttered the bread* with *?Mary hammed the bread* ‘put ham on the bread’, which is not lexicalized. Other spreading verbs are more interpretable even when novel – *Nutella’ed the bread* – possibly even for people who put ham more often than Nutella on bread.

but the typical use of the ground is to walk on or stand on. A bench may be a typical place to put players, but the typical use of a bench is for sitting. A bag may be a typical place for potatoes, but the typical use of a bag is to carry it. Hanging in the air may be a typical place for clothes, but the typical use for air is to breathe it. A schedule may be a typical place to put an appointment, but the typical use of a schedule is to consult it in order to find out where one is supposed to be on any given day. The floor may be a typical place for an opponent, but the typical use of a floor is to be walked on.

(149) ground the plane, bench the player, bag the potatoes, air the clothes, schedule the appointment, floor the opponent

The stereotypical actions associated with the change of state in these examples also seem quite important in their lexicalization. The act of putting a player on the bench, deciding that a plane needs to be grounded, or trapping one's opponent against the floor seem to be noteworthy, culturally relevant activities.

There are also many location examples for which the verbal use seems to correspond more closely to the canonical use of the source nominal. In e.g. *jail the criminal*, *shelve the books*, and *pen the pigs*, it does appear that being a storage location is the primary use of jails, shelves, and pigpens. Note, however, that the typical use of a jail is surely to hold criminals, not to put criminals into, and similarly for shelves and pigpens, so again there is a change-of-state meaning mediating the sense of the denominal verb.

Next we look at a third subclass of change of state verbs, the goal verbs (150). The relation between canonical event types and the meaning of these verbs is, again, somewhat indirect. Powdering is something that can be done to aspirin (or other solid but crushable substances), but the canonical event type associated with powder is probably not turning things into it. Looping is something that can be done to ropes (or other flexible linear objects), but the canonical event type associated with a loop – if there is a canonical event type at all – is probably not turning things into it, but perhaps using

it as an attachment or putting things through it. Sequencing is something that can be done to lessons (or other entities capable of being ordered), but the canonical event type associated with a sequence is probably moving through it in order, not putting things into it, though putting objects in a sequence is a very stereotypical activity. The only exception here may be braiding: the action of braiding hair (or other string-like objects) does seem sufficiently stereotypical to constitute a primary canonical event type, although there are other canonical event types associated with braids as well, such as wearing them or decorating with them.

(150) powder the aspirin, loop the rope, sequence the lessons, braid the hair

Unlike with some of the locatum and location verbs, we cannot appeal to the notion that the end state is the canonical event type. In the locatum and location cases, the end state is relational: saddles or carpets are canonically on other things; shelves and jails and bottles canonically have things on or in them. With the goal verbs, the end state is simply a state of being, and it seems very odd to say that the state of being powder, or the state of being a loop, is a canonical event type in itself. (If “state of being N” were a legitimate canonical event type, it would be canonical for every noun, so it is not discriminative.) For the goal verbs especially, then, it seems that the change of state itself is really the canonical event type. This means that it is not canonical with regard to the source nominal per se, but rather consists of a set of activities that are noteworthy when taken as a whole (grinding something up into powder, putting something in a sequence, weaving something back and forth to make a braid).

So far, it seems that the change of state described by the locatum, location, and goal verbs is the kind of event type which tends to be lexicalized in denominal verbs, rather than whatever is the most canonical event type of *the noun* being lexicalized. As observed by Kiparsky, there are several nouns which have multiple canonical changes of state, e.g. *index*, *powder*, *dust*, *ice*, and these all emerge as senses of the denominal verb.

We turn next to instrumental denominals, the denominal verb subclass for which we have seen that the canonical event type seems best aligned with the denominal verb meaning. Clark and Clark (1979) have several categories of instrumentals. The “go” (vehicle) category in (151) and “cleaning implements” category in (152) definitely involve canonical event types. The “hit” and “cut” categories (153) often involve canonical event types, although the subclass includes many additional examples where the canonical use has been overridden by context, as in *boot the man in the pants*, where the canonical use of boots is to wear them; and *bottle the sailor*, where the canonical use of bottles is to contain liquid. The “destroy” subclass (154) seems to correspond well to the canonical event type, as do the “simple tool” (155) and “complex tool” (156) subclasses.

(151) auto, caravan, cablecar, elevator, boat, wheelbarrow something somewhere,
ambulance something somewhere

(152) mop the floor, snowplow the road, rake the grass, towel himself dry

(153) hammer the nail, spear the fish, boot the man in the pants, bottle the sailor

(154) bomb the village, torpedo the ship, grenade the bunker, shell the fort

(155) lever the door open, wedge the window open, wrench the bolt loose, plane the
wood smooth, shovel the dirt

(156) jack up the car, winch the truck up the slope, brake the car, gin the cotton,
mill the grain

I propose that the reason the canonical event type can emerge most easily with instrumental verbs is that the argument structure template of the telic role (e.g. (157), adapted from the Pustejovsky-style telic role to allow for the agent, as in (144d)) aligns most closely to the surface structure of the sentence. Note that (157) has two open argument slots, which correspond to the surface subject and object. Since the instrument

is naturally expressed as an adjunct, the surface arguments can be unified with the open slots in the telic role.

(157) TELIC = clean(e, z, y) & using(e, x), where mop(x)

Even among instruments, there are some categories that pattern more like the location/locatum verbs, for example Clark and Clark's "fasten" category (158). The sentence *Mary stapled the pages* implies putting the staples in, whereas arguably the primary canonical event type related to a staple is not the act of putting the staple in, but the act of the staple holding pages together. This is shown in (159a) where the staple is the initiator; whereas (159b), which corresponds to *staple the pages*, is another canonical use, though perhaps not the primary one. The same argument holds for *lock the door*, where arguably the primary canonical event type is the lock holding the door closed, not the toggling of the locked state, although that is also a possible canonical event type. A *good staple* must hold pages well, not just be easy to put in, and a *good lock* must be one that does a good job of holding the door closed, not one that is easy to turn but, say, immediately comes unlocked again.

(158) nail, tack, staple, bolt, screw, paper-clip, pin, rivet, wire, solder, paste

(159) a. hold(e, x, y), where staple(x)
b. apply(e, z, y) & using(e, x), where staple(x)

We next look at some agent verbs (160), specifically the subclass of "occupation" verbs (I do not discuss here the non-occupation agent verbs such as *witness*). Many such verbs do seem to correspond to a canonical event type associated with the noun: butchering a cow means doing to it what butchers do; umpiring a match means doing what umpires do. For many agent verbs, the surface subject does not need to be actually employed in the profession named, as long as they are performing actions typically performed by that profession. For example, one can *nurse one's child back to health*

without being a professional nurse, or *soldier on* without being a professional soldier.

- (160) butcher the cow, jockey the horse, referee the game, umpire the match, nurse the patient, tutor the boys, valet the squire, pilot the ship, soldier, butler, clown, waitress

However, there is another subclass of agent verbs with the interesting property that the surface subject of the sentence must be employed as a member of the profession. The sentence in (161a) means that the person was actually employed as a waitress, and (161b) means that the person was employed as a butler. It would be infelicitous to say that one was *waitressing* in one's own home or a friend's home while carrying plates back and forth from the kitchen, or that one *butlered* at one's own home or a friend's home while overseeing household tasks. This subclass thus deviates from the canonical event type interpretation.

- (161) a. In order to make ends meet I was waitressing in a restaurant called Hades in South Kensington.
b. I have conducted many training sessions, hosted high end dinners and weddings, butlered for great people and famous names and worked onboard private jets.
(from WWW)

Finally, we consider food and drink nouns, which are not addressed by Clark and Clark (1979). It should be clear by now that these nouns mostly resist occurring with their canonical event type when used as denominal verbs. There are attested verb examples, but they tend to refer to some salient properties of the noun, not to eating and drinking (162).

- (162) a. Trying to get the perfect shot, they were pretzeling themselves into Twister-like contortions.

- b. Countless buildings pancaked into a heap of dust and rubble with the powerful earthquake that hit Haiti last month.

(from WWW)

5.3.6 Revised CUC

Based on the data and discussion in Sections 5.3.2 through 5.3.5, I propose the following revised CUC (163).

- (163) **Canonical Use Constraint (Revised).** A canonical event type associated with a nominal root can be a default interpretation for a denominal conversion verb if and only if the argument structure template of the canonical event type can be unified with the arguments of the denominal verb.

5.3.7 Application of proposal

My proposal clearly distinguishes between purpose telic and direct telic roles, predicting that the former will be permissible denominal verb meanings and the latter will not. In a transitive sentence like *Mary raked the leaves*, the surface position of *leaves* as undergoer is consistent with the argument structure template in the purpose telic role of *rake*, and can be unified with one of the argument slots in that template. It is possible to accommodate *rake* as an implied participant in the event because it does not need to occupy the initiator, undergoer, or resultee position to receive its interpretation.

An intransitive sentence like *Mary applied*, however, has no overt undergoer, and the proposal is that the source nominal cannot add an argument slot to the observed argument structure of the verb, which is intransitive. The telic role, however, requires *apple* to be in a direct object position; moreover, it must be in a complement position in order to receive an incremental theme interpretation. The only possible way to interpret the intransitive is to treat it as some kind of activity that has the property of apple-ness, which allows an interpretation in which apples are involved, but it cannot be one

where apples are a theme. Thus the direct telic role will not emerge as a denominal verb meaning, in contrast to the purpose telic role. The proposal therefore predicts denominal verbs that obey the Revised CUC.

There is also no vagueness about the origin of the causative component of location/locatum verbs, since I take an output-oriented approach rather than projecting the argument structure of the denominal verb from the telic role of the source nominal. Encountering a transitive verb like *saddle*, the hearer has the choice of interpreting it as atelic or telic. If telic, the hearer can interpret the direct object as an undergoer or a holder of a result state; for nominals like *saddle* the hearer will probably pick the latter, since putting a saddle on something is canonical to at least some degree, even if not the primary canonical event type. But if the object is a holder of a result state, then by definition the nominal root must be picking out an event type that includes both a causative component and a result component. The choice of event type has been constrained by the event structure negotiated between the interlocutors.

Returning briefly to the claim of Harley (2008) that canonical use meanings arise from the presence of a bare noun, I would suggest that such meanings are always mediated by syntax. Harley's examples are objects of locative prepositions, e.g. *in jail*. Perhaps this allows the 'holding criminals' canonical event type associated with jails, which is locative and thus consistent with the surface syntax, to come to the fore, similar to the way the canonical event type associated with incremental theme nouns comes to the fore in complement coercion (*begin the book*), where the noun is in direct object position, as it needs to be for a theme interpretation. On the other hand, using a bare noun whose canonical event type is not locative as the object of a preposition does not yield a canonical event reading. For example, the phrases *#with apple*, *#in apple* do not yield the 'eat apple' interpretation, despite the bare noun, because the direct telic role is not consistent with the syntactic structure.

5.4 Participant Non-Introduction

In this section I provide further evidence that the nominal root is an event predicate, lexically subordinated to the event structure, by showing that there are no event participants introduced by the root.

5.4.1 Background

It is well-known that denominal verbs do not introduce discourse referents (Harley, 2008), as seen in (164). Nor do we expect them to; if we assume that only a DP can introduce a discourse referent, then as with bare nouns in (semantic) incorporation (Farkas and de Swart, 2003), no discourse referent will be introduced by the nominal root.

- (164) Mary chained the chair to the wall. * It was heavy.
intended: ‘the chain was heavy’

On the other hand, since nominals typically pick out individuals, one obvious question is whether the meaning of a denominal verb involves an individual participant in the event, introduced by the nominal root. In many types of (semantic) incorporation the incorporated object does introduce an event participant, although it is discourse-opaque (does not support discourse anaphora), so if denominal verb formation involved incorporation we might expect a similar effect.

It is easy to find denominal verb examples where the nominal root appears at first glance to introduce a participant. In (165) there are, respectively, a knee (165a), a guillotine (165b), some sand, wax, and a seal (165c), and a roof (165d) involved as participants in the events described. Moreover, there is no other word in the sentence that characterizes these participants – if (165a) did not have the specific lexical item *kneeing*, we would not know a knee was involved, as opposed to some other implement – so it is tempting to think that a participant is introduced by the denominal verb.

- (165) a. (I had resorted to kneeing a Frenchman in the face over a biscuit the day before.)
- b. After trial and condemnation to death Maury was taken to be guillotined in front of a large crowd.
- c. He finished, sanded what he had written, waxed and sealed it, then gave it to Corbett.
- d. Work will now concentrate on roofing the structure, the floor and digging the inspection pit prior to the installation of machine tools.
- (All from BNC)

There are also what I would call “highly episodic” denominal verbs where it seems that the main, or possibly only, function of the verb is to introduce a participant (166). Here the speaker is simply naming what the interlocutor is holding and using; there is no additional import to the fact that the item happens to be a cookie or a spoon.

- (166) a. Are you going to cookie me in the head?
(Overheard among a group of graduate students fooling around in the student lounge with a box of cookies.)
- b. Are you spooning me?
(Overheard, spoken by parent in baby-talk, to a baby tapping the parent with a spoon.)

A useful notion to have here is *episodic linking*, introduced by Barker (1998) to characterize *-ee* nominals in English. Somewhat simplified, a noun N is episodically linked to a verb V if an individual which is an N is a participant in an event of type V. For example, a *gazee* must be someone who participates in a gazing event.⁴ Barker uses the notion of episodic linking to account for cases like *amputee*, where the individual

⁴Barker defines other criteria for *-ee* nominals as well, e.g. that they be sentient and minimally volitional, which are not relevant here.

picked out by the derived noun does not hold a role in the argument structure of the verb *amputate* (*The doctor amputated *Mary / Mary's leg*), but is nevertheless episodically linked to an amputating event.

In the case of *-ee* nominals, it is a given that the derived noun introduces a discourse referent. The question we are addressing here, on the other hand, is whether or not an episodically linked participant is introduced by the nominal root of a denominal verb. As Barker points out, Clark and Clark (1979) seem to invoke a notion similar to episodic linking when they say that “the parent noun denotes one role in the situation, and the remaining surface arguments of the denominal verb denote other roles in the situation”. For example, the semantics Clark and Clark provide for the sentence *The boy porched the newspaper* are in (167) (see Section 3.3.1 for details). Not only do the surface subject and object have roles in the semantic representation, but so does *a porch*.

(167) CAUSE(DO(the boy, something), COME-ABOUT(ON(the newspaper, a porch)))

Clark and Clark’s analysis explicitly requires a porch to be involved in the event; note the presence of a determiner, which seems to imply a full, discourse-transparent individual. However, they do not give an explicit definition of what is meant by a *role* in the semantic representation, whether it is an argument position, a participant in a situation, or something even more general, so it is difficult to say exactly what they predict.

The incorporation theory of denominal verbs also entails that the nominal root introduces an event participant for location and locatum verbs, since the root originates as the object of a preposition; the semantics of something or someone coming to be ‘with N’ (locatum) or ‘in/on N’ (location) imply that there is an individual N involved. See later in this section for the “adverbial increment” mechanism which is used to avoid this effect.

The question of participant introduction is related to a longstanding issue in the literature on denominal verbs, namely whether denominal verbs can be divided into two

classes based on their behavior with hyponymous arguments and adjuncts. McCawley (1971) claims that hammering need not be done with a hammer, but nailing has to be done with nails (168). Similar observations are made by Kiparsky (1982); Myers (1984); Arad (2003), and others.

- (168) a. He hammered the nail with a rock.
b. *He nailed the proclamation to the door with rivets.

(McCawley, 1971, his (17))

One way of looking at this issue is as a question of how literally the nominal root must be interpreted. For Kiparsky (1997) there are three gradations along the scale from literal involvement of the nominal to complete bleaching. In the first category, the nominal must be literally involved; one can *box a gift in a red box* but not *#box a gift in a bag*. In the second category, some aspects of the nominal meaning must be retained; one can *shelve a book on the windowsill* but not *shelve a book in a bag*: a sufficiently shelf-like location must be involved. The third category exhibits complete bleaching or attenuation of the nominal meaning, e.g. one can *dump* or *ditch* something without involving a literal dump or ditch, or even a dump-like or ditch-like location. Examples from Kiparsky (1997) are shown in Table 5.1.

Kiparsky (1997) considers the literal and semi-literal categories to be formed from nouns, and the third to be formed from roots. Once the noun is formed the meaning is fixed, and appears in the noun-formed verb as well, but a noun and a verb formed from the same root can have more idiosyncratically related meanings. Arad (2005) and Don (2005) also use hyponymous object diagnostics for root- versus noun-formation in Hebrew and Dutch, respectively. To account for the semi-literal and bleached categories within the incorporation approach, Hale and Keyser introduce the notion of an “adverbial increment”, which involves deletion of a referential index and addition of an extra element of meaning. However, Kiparsky observes that this mechanism is somewhat baroque.

	Noun-formed		Root-formed
	Literal	Semi-literal	
Instrument	tape, chain, but- ton, bicycle, screw, padlock, snowplow, charcoal	hammer, brush, paddle, string, whistle, convict, anchor, wedge	
Location	box, greenhouse,	cage, pocket, shelve, land	dump, ditch, skewer
Locatum	fence, oil, star, crown	paint, butter, dust, blanket	

Table 5.1: Gradations of noun-formed and root-formed meaning, from Kiparsky (1997).

In fact, the division of denominal verbs into classes according to their behavior with hyponymous arguments and adjuncts is not uncontroversial. The infelicitous examples are now thought by some to result from choosing a hyponymous object or adjunct whose “manner of use” (Harley and Haugen, 2007) is too different from the characteristic manner of use of the nominal root. Thus (169a) and (169c) are infelicitous, but (169b) and (169d) are fine. In addition, Harley and Haugen point out that (169c), which Kiparsky (1982) judges as infelicitous, is actually “perfectly acceptable, *iff* the action of affixing the fixture onto the wall involves twisting nails into the wall, in the manner associated with driving in screws”.

- (169) a. # Lola taped the poster to the wall with pushpins.
b. Lola taped the poster to the wall with band-aids / mailing-labels.
c. ? Screw the fixture on the wall with nails.
d. Screw the fixture on the wall with corkscrews.

(Kiparsky, 1982; Harley and Haugen, 2007)

Dowd (2010) further proposes that some nouns are defined by their functions and others by their forms. *Hammer* is defined by its function, and allows hyponymous in-

struments of different form but similar function; but *tape* is defined by its form, and so only allows hyponymous instruments that are similar in form. It is not clear to me that this is a true dichotomy; function is also important for *tape*, since one could not *#tape the poster to the wall with ribbon*, even though ribbons are very similar in form to tape. However, the observation that form is an important component of meaning for nominal roots is an interesting one. Consider (170a) compared to (170b): the latter is more felicitous, even though the instrument described in (170b) is less fit for purpose, because it is more similar in form to the root \surd *bicycle*.

- (170) a. *#Mary bicycled to work on her tricycle.*
b. *Mary bicycled to work on a contraption made from two metal drums and some old pipes.*

In conclusion, I assume that there is no dichotomy between *hammer*-type and *tape*-type denominal verbs, but rather that hyponymous object and adjunct diagnostics are faulty when the object or adjunct chosen is too dissimilar in form and/or function to the nominal root. An important point, however, is that much of the previous work which addresses how literally the nominal root must be taken assumes that there is a participant involved – the one referred to by the hyponymous object or adjunct – which is more or less literally described by the nominal root. To put it another way, the hyponymous object and adjunct diagnostic makes sense only if it is possible to invoke an individual that plays the object or adjunct role. What I address in the rest of this section is a related but separate question: whether there is guaranteed to be any such participant at all.

5.4.2 Empirical investigation

I now look at some subclasses of denominal verbs to determine whether a participant is introduced by the nominal root. Let us consider instrument verbs first. In (171) there

are definitely event participants that correspond to the nominal root – which does not necessarily mean that the root introduces the participants, simply that there seems to be a literal ladle involved in (171a), a literal fork in (171b), and so on.

- (171)
- a. The other night I ladled out the lasagne, took a swig of Sainsbury's Vin Ordinaire and said determinedly, 'The political scene is very interesting at the moment, isn't it?' (BNC)
 - b. He forked the remaining bit of sausage and dipped it into the runny egg yolk. (BNC)
 - c. We re-arranged the room, swept and mopped, cleaned the windows, dusted the lockers and changed into combat kit for the day. (BNC)
 - d. As I taxied to Bakers Hotel from Paddington Station (Heathrow Express), the driver told me about the earthquake in Japan. (WWW)
 - e. He was stretchered into an ambulance but a spokesperson has since said he is 'fine'. (WWW)
 - f. Learning to paddle a canoe takes some practice, but once you get it, you'll never forget! (WWW)
 - g. Ears should only be syringed if there is a real need – if you're in pain or if there's a reduction of hearing in one ear, for example. (BNC)
 - h. Bored stiff by him, I paid little attention: he retaliated by having me birched for idleness on three occasions, but these attempts to drive Latin into me from the wrong end proved equally unproductive. (BNC)

In (172) the situation is slightly different. Here the interpretation of the nominal root is metaphorical rather than literal, but it still describes an event participant, which is explicitly named elsewhere in the sentence. In (172a), for example, the *fist* is explicitly named as the instrument in the hammering event. The fist can be thought of as a hyponymous instrument, considered metaphorically as a type of hammer. Similarly, the

handkerchief is a type of mop, the bread is a type of mop, spices are a type of paste, “jell” [sic] and superglue are a type of paste, the butt of the rifle is a type of club, and the grease is a type of gum. Though they may be semantically hyponymous instruments, it would be incorrect to suppose that the explicit participant and the nominal root are two pronounced copies within a movement chain, since, in addition to *with*-PPs, we also have the *handkerchief* (b) and *grease* (g), which are not in appropriate syntactic positions for that analysis.

- (172) a. The Silver Child hammered the door with her fist, causing the entire room to shake. (WWW)
- b. He took out a handkerchief and mopped the slight perspiration from his face. (BNC)
- c. It was as good as a ballet to watch Finn eat but Francie mopped gravy with bread and chewed bones from his fingers. (BNC)
- d. The smell was powerful as the cook pasted it with spices over the grill. (WWW)
- e. He had grown what remained of his wiry hair very long and then combed it forward and pasted it with jell [sic] or superglue onto his bald pate! (WWW)
- f. She turned the rifle on its side and clubbed him down brutally with the butt. (BNC)
- g. Against the left-hand wall stood an old-fashioned gas stove so heavy that Meg was unable to move it to clean behind it and preferred not to think of the accumulated grease of decades gumming it to the wall. (BNC)

It is clear in (172) that the nominal root is not introducing a participant, since the hyponymous instruments are explicitly introduced by another element of the sentence. Consider a set of parallel sentences in which verbs from verbal roots have been substituted

for the denominal verbs (173): there are no “missing” participants, that is, there was no *hammer* other than the fist; no *mop* other than the handkerchief, no *gum* other than the grease.

- (173)
- a. The Silver Child hit the door with her fist, causing the entire room to shake.
 - b. He took out a handkerchief and wiped the slight perspiration from his face.
 - c. It was as good as a ballet to watch Finn eat but Francie wiped gravy with bread and chewed bones from his fingers.
 - d. The smell was powerful as the cook covered it with spices over the grill.
 - e. He had grown what remained of his wiry hair very long and then combed it forward and attached it with jell [sic] or superglue onto his bald pate!
 - f. She turned the rifle on its side and pushed him down brutally with the butt.
 - g. Against the left-hand wall stood an old-fashioned gas stove so heavy that Meg was unable to move it to clean behind it and preferred not to think of the accumulated grease of decades attaching it to the wall.

Beyond these cases, we also have examples where the instrument is even more metaphorical or abstract, and is not named elsewhere in the sentence at all (174). Here it would be even more of a stretch to suppose that the source nominal of the denominal verb names a participant. It certainly does not introduce a new participant, although in a very loose sense it may describe the subject of the sentence in some of the examples: in (a) *Kate* herself could be considered the wrench, and the *wind* in (b), and *he* could be considered the plough in (c). The *ministers* could be the guillotine in (i). However, no participant is really a skate in (d) and (e); rather the denominal verb describes a manner of motion similar to skating. Again, substituting verbs from verbal roots does not seem to change the number of participants (175).

- (174) a. Kate wrenches at Jeremy's arm and his attention. (BNC)
- b. He shouts something but the wind wrenches it away. (BNC)
- c. Without waiting for an answer he ploughed straight on. (BNC)
- d. More than critical accounts of class or 'race', feminism is currently an important vehicle for bringing into psychology the social questions which the discipline skates over. (BNC)
- e. But in the desert it gives a strange moaning sound, low and sensual, accompanied by the singing of the sand as it skates across itself. (BNC)
- f. 'MI6 and CIA pumped in money, arms, radios. (BNC)
- g. Grabbing his bike from the hedge where he'd hidden it, Jack raced with all his might, his long, gangling legs pumping for all they were worth. (BNC)
- h. Graham axed David Rocastle two seasons ago, accusing him of being overweight after the summer break. (BNC)
- i. Guillotining the Bill at this early stage shows that Ministers are frightened to come to grips with the legislation and face scrutiny of the details of their own Bill. (BNC)
- (175) a. Kate pulls at Jeremy's arm and his attention.
- b. He shouts something but the wind pulls it away.
- c. Without waiting for an answer he moved straight on.
- d. More than critical accounts of class or 'race', feminism is currently an important vehicle for bringing into psychology the social questions which the discipline passes over.
- e. But in the desert it gives a strange moaning sound, low and sensual, accompanied by the singing of the sand as it passes across itself.
- f. 'MI6 and CIA put in money, arms, radios.
- g. Grabbing his bike from the hedge where he'd hidden it, Jack raced with all his might, his long, gangling legs pushing for all they were worth.

- h. Graham removed David Rocastle two seasons ago, accusing him of being overweight after the summer break.
- i. Canceling the Bill at this early stage shows that Ministers are frightened to come to grips with the legislation and face scrutiny of the details of their own Bill.

Let me point out that it is not tremendously surprising to observe metaphorical extension in the meaning of denominal verbs. No doubt some of these verbs have undergone a process of sense extension over time, e.g. perhaps *guillotine* meant a literal guillotine at first and only came to have the metaphorical ‘kill/cancel’ meaning over time. The point of interest is not the process of metaphorical extension itself but rather that, synchronically, no participant is introduced by the source nominal in many denominal verbs. In fact, in my experience annotating corpus examples (Chapter 4), the metaphorical examples were more frequent than the true participant examples.

Let us look briefly now at locatum verbs, where we can observe that the situation is quite similar to the instrumental verbs. (I do not provide examples of location verbs here, but they are also quite similar to the instrument and locatum verbs.) In (176) we have literal locatum examples, where a participant corresponds literally to the nominal root and is not introduced explicitly by any other phrase. In (177) we have metaphorical locatum examples, where an explicit participant is introduced elsewhere in the sentence and serves as a hyponymous adjunct to the denominal verb. In (178) we have completely abstract examples, where there is no participant corresponding to the nominal root.⁵

- (176) a. They shackled my legs so that I could not run. (BNC)
- b. Now he closed the stiff cover of his folder in which his PA had meticulously tagged all the papers and cross-references, and said dismissively: ‘Any other business.’ (BNC)

⁵Note the interesting intransitive example in (178c).

- c. The French girl, to Thessy's infinite embarrassment, had strolled stark naked about Wavebreaker's deck while the lawyer had cowered in the state-room cloaked like an Ayatollah with impetigo. (BNC)
 - d. To give him time to make his getaway he ties me up, blindfolds me, gags me and hides me in a cupboard. (BNC)
- (177)
- a. Mr Mellor, unlike his Prime Minister, was opposed to shackling the Press with privacy laws. (BNC)
 - b. Texts 'tagged' with part of speech information in this way are extremely useful resource for a wide range of research purposes. (BNC)
 - c. Swathes of rain cloaked the noisy inn like the bed-curtain drawn round a feverish and delirious child, while the dark, deserted houses of the rest of the village kept a silent, gloomy vigil round about. (BNC)
 - d. A woman is gagged by a hand, faces scream and genitalia are exposed, as photographed fingers point accusations at the license of pornography. (BNC)
 - e. There was a feeling in Parliament that the Bill would prevent the press from saying anything controversial – it would 'gag the press' – but Ngurumo's feeling was that prevailing practices would continue whether the Bill was passed or not. (BNC)
- (178)
- a. For those who found this social order irksome the rebellious, the ambitious or simply the single-minded ; the village could become a narrow and restrictive prison, dispiriting and mean-spirited, shackling the individualist by the vicious purveyance of gossip and innuendo. (BNC)
 - b. Ireland tagged along, trying to prove that playing on reserves of passion and pride were good enough. (BNC)
 - c. The Labour party cloaks under expressions such as 'attack on civil rights'

the fact that such people have not registered for the tax and have been indulging in tax avoidance, a practice for which the Labour party still shows some sympathy. (BNC)

- d. Mason's rejoinder was that he was not going 'to be gagged' about amalgamation. (BNC)

There are also other entire subclasses of denominal verbs in which it is clear that no participant is introduced by the nominal. In these classes it appears that the nominal root is (literally or metaphorically) describing the surface subject of the sentence. This includes Clark and Clark's class of agent verbs, e.g. *witness*, along with the profession verbs, such as *waitress*, *butler*, and *soldier*. Animal verbs fall into this category as well: if *Mary dogs/parrots someone* then she is acting like a dog or a parrot in some way, but there is no dog or parrot participant other than Mary, the subject of the sentence. Some manner of motion and other activity verbs are like this as well (179).

- (179)
- a. Le Tissier went on a run that took him ghosting past two defenders only for Baker to save. (BNC)
 - b. I was facing away from my boyfriend, he was spooning me from behind. (WWW)

I conclude that the nominal root does not introduce an event participant in a denominal verb, since if it did, the metaphorical and abstract examples would not be so prevalent. Instead, all denominal verbs are essentially like Kiparsky's bleached verbs.

5.4.3 Implied participants

What about the "highly episodic" examples, which seem to entail the existence of an event participant matching the description of the nominal root? These are the cases like *cookie me*, where it seems to be entailed that a cookie is involved in the event, unless the speaker and hearer share some very specialized knowledge of what else *cookie* could

mean. Similarly, what about the “literal” examples of instrument and locatum verbs?

I propose that in these cases an event participant can be implied by the denominal verb without being introduced as a participant. Pustejovsky (1995, p.63-6) refers to such individuals as *default arguments*. Examples are the physical material in a carving event (180) or the location in an arriving event (181), both of which are logically entailed by the verb, and may be optionally expressed in syntax but are not obligatory.⁶ Another example of an entailed default argument is the bullets in a shooting event (182), which are entailed, but not obligatorily expressed. Pustejovsky proposes that default arguments are specified in the lexical entry for a verb, and that an existential closure operation accounts for the existential entailment of e.g. material in (180), a location in (181), and bullets in (182).

- (180) a. Mary carved a doll.
b. Mary carved a doll out of wood.
c. Mary carved the wood into a doll.
(adapted from Pustejovsky (1995, p.64))

- (181) a. Mary arrived.
b. Mary arrived in Paris.
(adapted from Pustejovsky (1995, p.190))

- (182) a. Mary shot the clay pigeon.
b. Mary shot bullets at the clay pigeon.

⁶Pustejovsky further defines *shadow arguments* as a subset of default arguments, specifically the default arguments that must be expressed as hyponymous and not cognate arguments in order to be felicitous (i). Such arguments are probably very closely tied to the meaning of the verb – one cannot use anything but one’s leg to kick – whereas the materials for carving or the locations for arriving have a wider range of possible options. However, it is not clear whether there is a hard and fast dividing line between shadow and non-shadow default arguments.

- (i) a. Mary buttered her toast with margarine / *with butter.
b. Harry kicked the wall with his gammy leg / *with his leg.
(Pustejovsky, 1995, p.65)

Such examples should make it clear that verbal roots often entail particular event participants, based on idiosyncratic root meaning and world knowledge, even though these participants are not syntactically obligatory. I leave open the question of whether an existential closure operation is really necessary or whether the entailments can be recovered from the denotations of the roots. However, I propose that entailed participants of nominal roots in denominal verbs are accounted for in the same way: context and world knowledge *sometimes* lead the hearer to posit an appropriate participant in order to interpret an utterance, even though the participant is not formally introduced by the denominal verb.

I also suggest that participants are easier to infer in some roles than others. Participants who fill core argument roles, namely those in the Ramchand skeleton – initiators, undergoers, themes, and resultees – must be in the appropriate argument position, that is, specifier of a subeventual head in the Ramchand system, or complement of *proc* for themes. Given a denominal verb, formed from a nominal root in verbal head position, it is thus easier to infer an adjunct participant such as an instrument, which does not need to be in a core argument position.

5.4.4 Application of proposal

My proposal regarding the status of the nominal root as an event predicate explicitly avoids the introduction of arguments by the nominal root. The root only modifies the subeventual heads in the Ramchand skeleton, assisting the hearer in picking out a relevant set of events, that is also consistent with the observed syntax of the verb. On the other hand, my account does not preclude an entailed default argument, if that is part of the meaning negotiated by the interlocutors for the denominal verb.

5.5 Nameworthiness

In this section I discuss nameworthiness effects and whether they can account for the constraint against theme, patient, resultee, and initiator interpretations of intransitive denominal verbs. I compare the locus of nameworthiness effects for N-V compounds and denominal verbs, concluding that they are different in a way which supports the proposal that the nominal root is an event predicate in denominal verbs, and then speculate on why nameworthiness effects arise most strongly for intransitive denominal verbs.

5.5.1 Background

Nameworthiness effects have often been noted in the literature for phenomena on the boundary between lexicon and syntax, such as noun incorporation, pseudo-incorporation, compounding, and bare nominal constructions (e.g. Downing, 1977; Pawley, 1982; Mithun, 1984; Farkas and de Swart, 2003; Borthen, 2003; Dayal, 2003, 2011; Carlson, 2006). These are all ways of combining a verb and a (bare) noun with semantic effects that go beyond the strictly compositional. These phenomena exhibit a constellation of typical characteristics, including interpretation as a narrow-scope non-specific indefinite, number-neutrality, discourse-opaqueness, and nameworthiness; for a summary see Carlson (2006). Here I am interested in nameworthiness, which refers to the fact that these V-N structures are felicitous only if the concept described is perceived as unitary, institutionalized, and culturally important or salient, or in the terms of Dayal (2003), “appropriately classificatory”. The phenomenon is illustrated in (183) for English N-V compounds and (184) for Norwegian bare singulars. In (183), mountain-climbing is an institutionalized activity, while ladder-climbing is not. In (184), calling from a phone booth is a “conventional situation type” (Borthen, 2003), licensing the bare singular *telefonkiosk*, but jumping from a phone booth is not.

- (183) Q: Where is your brother?
 a. He is out mountain-climbing.
 b. #He is out ladder-climbing.

(Mithun, 1984)

- (184) a. *Han ringte fra telefonkiosk*
 he called from telephone-box
 'He called from a phone box'
 b. ??/**Han hoppet fra telefonkiosk*
 he jumped from telephone-box
 'He jumped from a phone box'

(Borthen, 2003)

Nameworthiness is of interest in the context of denominal verbs because denominal verb formation has been compared to incorporation; Harley (2008) has also compared denominal verbs to other bare noun constructions, specifically PPs like *in jail*. It is therefore worth investigating whether and where nameworthiness effects occur with denominal verbs.

5.5.2 Nameworthiness effects in denominal verbs

Denominal verbs seem to exhibit nameworthiness effects, especially intransitive denominals. Recall the *teapot* example from Clark and Clark (1979), as well as other facilitating contexts in (185) and (186) (repeated here from (130) and (131)). In each case, the denominal verb reading can be accommodated when the context makes it clear that the verb names a specific activity in the common ground of the interlocutors, that is, the activity is nameworthy.

- (185) a. #I've been necktie-ing. (intended reading: wearing a necktie)
 b. You and your colleague work in a garment factory. On any given day you may be making gloves, socks, or neckties. At the end of the day, your

colleague asks:

What have you been doing today?

Answer: I've been necktie-ing.

(186) Context: attending a carnival where there are various silly competitions, one of which is to determine the person who can keep a spoon stuck to their nose the longest.

Q: Where's Mary?

A: Oh, she's over there spooning at the moment.

Recall also that the only intransitive consumption verbs which are lexicalized are those which refer to a ritualized activity, not just the consumption of some food or drink, e.g. *to lunch (with someone)*. Also, while a verb like *grapefruit* 'eat grapefruit' is infelicitous out of the blue, it can be accommodated when it refers to a specific set of activities, such as dieting by eating nothing but grapefruit, or eating grapefruit as a way of staying healthy (187) (repeated here from (95)).

- (187) a. [On a raw foods discussion board] Vin, Wanna do a three day grapefruit fast with me? Oh, come on..it will be fun [... discussion of grapefruit fast ...] I am definately [sic] going to do the rebounding while grapefruiting ...
- b. For the past several weeks Tyler and I have eaten a grapefruit every night, almost without fail. That's one (sometimes two) grapefruit for each of us, not just a half. Once we realized that grapefruiting was becoming a habit, Tyler bought serrated grapefruit spoons.
- (both from WWW)

Transitive denominal verbs do not seem to show such strong nameworthiness effects. The sentence *Mary applied Susan* depends on context to be fully interpretable, but it has

a kind of default instrument reading where Mary did something to Susan with apples – some of my informants have reported that hitting comes to mind – which emerges from the observed argument structure.

5.5.3 Do nameworthiness effects account for interpretation constraints?

Perhaps the missing theme, patient, resultee, and initiator readings are attributable to nameworthiness effects. That is, perhaps *apple* is not a felicitous denominal verb because eating apples is not an institutionalized, salient, appropriately classificatory event type. This does not mean that eating apples is uncommon; as Borthen (2003) points out, frequency and nameworthiness do not necessarily go hand-in-hand. As with ladder-climbing in (183), it may in fact be so common and compositional that there is no need for a new verb; climbing mountains is a nameworthy hobby, while climbing ladders and eating apples are not.

I would argue that this cannot be the whole story, because denominal verbs with other argument structures are equally lacking in nameworthiness, yet lexicalize easily. This is particularly true for transitive instrumentals: I do not believe it would be possible to argue that *brushing hair*, *raking leaves*, *mopping the floor*, or *flossing one's teeth* are more nameworthy than *eating apples*, *reading a newspaper*, or *playing a symphony*. The only difference is where the nominal root fits into the argument structure; once again we see that argument structure mediates semantic effects, as with canonical event types.

5.5.4 Comparison of N-V compounds and denominal verbs

Let us consider whether nameworthiness effects for intransitive denominal verbs arise the same way they do for N-V compounds in English. On an incorporation account, one might expect them to be very similar, since the incorporation structure for unergatives is essentially an N-V compound with a null verb.

There are some notable differences, however. The first one is obvious, but also

important: in N-V compounding and the other crosslinguistically attested phenomena involving bare nouns, there is both an overt verb and an overt noun to consider, and it is the combination of the two which is important when determining nameworthiness. Consider mountain-climbing versus ladder-climbing. Climbing is a typical activity associated with both mountains and ladders. Most people probably climb ladders far more frequently than mountains. Again it is not the frequency of the activity that matters, but the degree of ritualization; and what matters is the degree of ritualization of the *whole* activity, encompassing both noun and verb.

In denominal verbs, there is no overt verbal root, and as a result the nominal root must name the whole event, and not serve as the object of a named action. One could form an indefinite number of potential N-V compounds involving pencils, for example (188a), but there is only one denominal verb (188b). This means that the event type described by the verb is far less specified; whatever gives the property of pencil-ness to the event must be negotiated between the interlocutors.

- (188) a. pencil-using, pencil-buying, pencil-eating, pencil-sharpening, pencil-selling,
pencil-storing, pencil-giving, ...
b. penciling

The contrast between N-V compounds and denominal verbs is also apparent in (189), where the presence of the overt verb in (189a) allows for the mention of a nameworthy activity. In (189b), despite the fact that climbing is a canonical event type for mountains, the verb is infelicitous. I suggest that this is because the theme constraint interferes with the felicity of the intransitive denominal verb on the ‘climbing’ interpretation; there is no such problem with (189a).

- (189) Q: Where is your brother?
a. He is out mountain-climbing.
b. # He is out mountaining.

The contrast in (189) brings up an interesting difference between the notions of nameworthiness and canonical event types. These notions are related, since both refer to extralinguistic knowledge that affects word formation, and both also involve a notion of typicality. However, they have a different locus. A canonical event type of a nominal is an action that has a high *degree of ritualization with regard to the nominal*. Nameworthiness of an N-V compound, however, refers to the *degree of ritualization of the whole compound*. In (189a), the compound names an action that is sufficiently ritualized to be nameworthy. In (189b), regardless of whether there is a canonical event type associated with mountains, intransitive *mountain* on its own does not pick out a set of events with a sufficient degree of ritualization to be nameworthy (at least not without additional assumptions about the common ground of the interlocutors).

The second important difference between N-V compounding and denominal verbs is the presence or absence of existential closure on the nominal. Most theories of pseudo- or semantic incorporation use an existential closure operation to account for the entailment of an event participant which is described by the nominal (Farkas and de Swart, 2003; Dayal, 2003, 2011). (An existential closure operation is used rather than an existential quantifier in order to account for discourse opacity.) For example, the existence of a mountain is entailed if one goes mountain-climbing. As we saw in Section 5.4, however, a nominal root in a denominal verb does not introduce a participant, although one may be implied. This difference supports the proposal that nominal roots in denominal verbs are event predicates, and thus have a different syntactic status than the nominal in N-V compounds, which is more argument-like.

5.5.5 Nameworthiness effects for intransitive denominal verbs

I speculate that the nameworthiness effect is especially strong for intransitive denominal verbs because of the need to interpret them as having an agent-oriented manner

component, as discussed in Section 3.10. Compare (190a) and (190b), which are almost identical, except that in (190a) the name of the food stands in for a particular diet routine undertaken deliberately, while in (190b) the name of the food does not refer to any deliberate and cohesive set of actions, just the fact that meat has been eaten. This difference in agent orientation has an effect on felicity. Since noteworthy activities, i.e. those that are institutionalized or culturally salient, come along with a set of well-defined actions, they facilitate the agent-oriented manner interpretation which is needed for interpretation of an intransitive denominal verb.

- (190) a. I've been grapefruiting a lot lately, and I feel great.
 b. # I've been meating a lot lately, and my doctor says my cholesterol is up.

Transitive denominals do not have such strong nameworthiness effects, perhaps because there is a second argument which the nominal root can interact with. For example, in *Mary applied Susan*, by definition we have Mary as the initiator and Susan as the undergoer. The verb must identify an event which is initiated by Mary and affects Susan; that is, the verb identifies the interaction between Mary and Susan, and is not exclusively agent-oriented. This allows the verb to draw on a general 'acts on' template of meaning, and makes an instrumental interpretation easier.

5.6 Semantic Hierarchy Effects

Following Bierwisch (1986) and Wunderlich (1987), Kiparsky (1997) proposes that only the argument with the theta-role lowest in the hierarchy can be incorporated as the source nominal of a denominal verb. The upshot of this is that an instrument is incorporated rather than a direct object (191).

- (191) a. Mary hammered the nail.
 b. *Mary nailed with a hammer.

In fact, this follows from the approach presented here, simply because it is impossible to have an incorporated undergoer to begin with: a transitive interpretation depends on the undergoer nominal being in the correct argument position. Thus in (191b) the problem is not that the wrong argument has been incorporated, but that *Mary nailed* does not refer to a situation where nails are the undergoer, with or without the PP. In a sentence like (191a), on the other hand, *nail* is in the correct position to receive an undergoer interpretation.

CONCLUSIONS

In this dissertation I have proposed that nominal roots in English denominal conversion verbs do not originate in argument position in sublexical syntax, but adjoin directly to subeventual heads, and are interpreted as predicates of events. I argued that this proposal accounts for the infelicity of intransitive denominal conversion verbs where the source nominal is intended to be an incremental theme, a patient, or the holder of a result state. I also argued that the proposal can account for the well-known infelicity of denominal conversion verbs in which the source nominal is intended as an agent or cause.

Based on this proposal, I predicted that English denominal conversion verbs should exhibit the same argument and event structure possibilities as verbs built from verbal roots, and confirmed this prediction with a corpus study. The corpus study also showed that nominal roots used as verbs have a significantly higher likelihood of appearing in transitive frames than verbal roots do. I have speculated that this difference is related to the constraints on interpreting intransitive denominal conversion verbs in English.

Finally, I have investigated the role played by canonical event types in the semantics of various subclasses of denominal conversion verbs, and proposed a revised Canonical Use Constraint, which states that a canonical event type associated with a nominal root can

be a default interpretation for a denominal conversion verb if and only if the argument structure template of the canonical event type can be unified with the arguments of the denominal verb. I further explored whether nominal roots in English denominal conversion verbs introduce event participants, and the locus of nameworthiness effects.

There remain a great many questions about the building blocks of denominal verbs, especially intransitives. As hinted in the brief discussion of Basque unergatives, one of the most fruitful lines of inquiry is likely to be a cross-linguistic comparison, particularly with languages where verbs formed with overt denominalizing verbal morphology exhibit semantic effects which can be compared to those found for English conversion verbs.

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