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Modularity in Thematic versus Aspectual Licensing: Paths and Moved Objects in Motion Verbs

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1. INTRODUCTION

This article compares the distribution and behaviour of noun phrases denoting paths and moved objects in two classes of verbs representing translative motion. The phenomena outlined in this article lead to a highly modular account, in which three parameters must be recognized. These are: aspectual versus thematic licensing; structural versus inherent case assignment; and referentiality versus non-referentiality. Each of these distinctions has some effect on argument-like versus adjunct-like properties. This underscores the modular nature of some of the traditional tests for the argument/adjunct distinction and therefore also the modular nature of some of the traditional notions of what distinguishes arguments and adjuncts. By necessity I will use the terms "argument" and "adjunct" in a pretheoretic way in certain parts of this article. I will indicate this by referring to argument-like and adjunct-like properties. A particular result of this article will be to propose that some of a verb's arguments may be arguments of an aspectual structure, which is itself an adjunct in the verb's thematic structure.

Section **2** introduces translative motion and the three argument-types associated with it. Section 3 introduces aspectual structure and discusses the relation of translative motion to aspectual structure. Section **4** introduces two verb classes in detail, the verbs of imparting motion (*push*) and the verbs of consuming distance (*walk*), and demonstrates that they differ minimally from each other in the presence or absence of a moved object. Section **4** also discusses thematic licensing and its relation to aspectual licensing. Section **5** addresses the distribution and properties of paths, comparing them with moved objects, and examines the differences between referential and non-referential paths. Section 6 discusses the theoretical

This paper has benefited immensely from the comments of three anonymous reviewers. Any shortcomings, are of course, my own.

conclusions of the article and section 7 provides a brief summary. An Appendix is also provided which outlines the place of this article within the general aspect literature.

2. THE ARGUMENT STRUCTURE OF TRANSLATIVE MOTION

This article examines verbs involving motion of a particular kind, which I will call translative motion. Translative motion is the motion of something along a path to a definite goal. Consider sentences (1) and (2).

(1) Laura walked the Long Trail to Canada.

(2) Liza pushed her bicycle to the university.

In (1) ***Laura*** represents an agent that moves along a path (the ***Long Trail)*** to a goal ***(Canada).*** In (2) both ***Liza*** and the ***bicycle*** move along a path toward the university, arriving at the goal (the ***university).*** These verbs specify some manner of motion, they specify no particular direction to the motion,[1] and they can be used to denote an event involving motion along a path to a goal. I focus in this article on a comparison between verbs like ***walk*** and verbs like push, specifically in the usage implying translative motion of some object along a path to a goal. In this usage the two verb classes represent a near-minimal pair, sharing the semantic properties of translative motion along a path to a goal, and differing only in the presence or lack of a separate moved object besides the agent. I will call the class of verbs like ***walk*** the "verbs of consuming distance" and the class of verbs like push the "verbs of imparting motion".

To further minimize the distinction between these two classes, I define the verbs of imparting motion here, as having the property that the agent may be interpreted as accompanying the motion of the moved object (and in the translative motion usage, is so interpreted). Under this approach, for both verb classes, we have verbs encoding a manner of motion for an agent which undergoes some translative motion along some path to a goal; except that with the verbs of imparting motion, the agent also causes a moved object to travel along with it. All the verbs included here in the verbs of imparting motion class have a possible reading in which the subject agent accompanies the motion of the moved object?[2]

Sentences (1) and (2) illustrate the argument structures associated with translative motion for the verbs of consuming distance and the verbs of imparting motion.

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[1] Verbs which imply a specific direction to the motion include Levin's **(1993)** class of verbs of inherently directed motion (e.g., *arrive*, ***fall*** and escape) and verbs which deictically specify a direction of motion (e.g., ***bring*** and take). Verbs with a specified direction of motion as an element of their meaning have distinct properties, which I will not address here.

[2] Although the verbs of imparting motion may be described as involving "causation of accompanied motion" (Levin 1993:136,138), they do not necessarily require that the agent move with the moved object. Verbs like push do not always require the subject or agent to

The external argument of these verbs is the instigator or the cause of the motion (*Laura* and *Liza* in the examples above). Agentivity and the "CAUSE"[3] element of meaning have long been recognized in the literature as being of special importance in the organization of argument structure, and as being associated with the external argument. I focus here specifically on those arguments of the verb which do not involve being a causer or an agent. The article examines the internal arguments that may be associated with these two verb classes in the translative motion usage. The three kinds of internal arguments which may occur with these two verb classes in the translative motion usage may be generally characterized as goals, paths, and moved objects. The moved object is the thing that travels along the path, and the goal marks the endpoint of the path and the journey. The term "moved object" is used here specifically to mean an object that is not the agent or cause of its own motion, but is moved by some agent external to it."

The three argument types of goal, path and moved object are inherently associated with the semantics of translative motion along some path to some goal. All three arguments may occur as noun phrases (NPs) in the verb phrase, and paths may also occur as prepositional phrases (PPs). Path PPs may include a goal NP within them:

(3) a. Laura walked the Long Trail.

b. Laura walked the Long Trail to the Canadian border.

c. Laura walked to the Canadian border.

d. Laura walked her bicycle to the university.

(4) a. Liza carried the package.

participate in the translative motion (*Lizupushed the toy bout across the swimming pool by giving it a good shove*).

Verbs like *kick* and *shove* are interesting because they may be commonly used to indicate unaccompanied motion. The most likely interpretation of *Laura shoved/kicked the package to the door* (in the mind of this author) would be one involving unaccompanied motion, where the package traveled to the door and Laura did not. However the sentence could also mean that Laura traveled to the door, while shoving or kicking the package along in front of her, and therefore these verbs are included among the verbs of imparting motion. When verbs like *kick* and *shove* are compared to verbs that cannot refer to accompanied motion, such as *send* or *mail*, they turn out to be different in a number of ways, which space prohibits my outlining.

[3]For some examples of lexical entries that employ a CAUSE predicate, see the Lexical Conceptual Structures of Hale and Keyser (1987), or the Conceptual Structures of Jackendoff (1990).

[4]Defining the moved object in this way allows us to distinguish the agentive element of meaning in the lexical semantics from the element of meaning involving simply motion along a path. *Laura* in (1) may be thought of as an argument in which the agent and the moved object are merged in one argument. This leads to a number of interesting questions I will not pursue here.

b. Liza carried the package to the university.

The Long Trail in (3a–b) is a noun phrase indicating the path. (The Long Trail is a hiking trail that runs the length of the Green Mountains of Vermont, from the Massachusetts border to Quebec.) The noun phrases ***the Canadian border*** and ***the university,*** in (3b–c) and (4b) above, refer to goals. The noun phrases ***her bicycle*** in (3d) and ***the package*** in (4a–b) indicate moved objects, since they are the objects which move along the path to the university. Since the term "moved object" refers to an object that is moved by some agent external to it, Laura is not a moved object in (3) above because she is the agent of her own motion, even though she may be thought of as moving along the path to the goal. Path PPs incorporating a goal are illustrated in ***to the Canadian border*** (3b–c) and ***to the university*** (3d and 4b). In this respect these argument types diverge from traditional notions of thematic roles because one argument type (e.g., a path) may be composed out of another (e.g., a goal) in the syntax. Also, a path may be associated with more than one syntactic element in the same sentence (e.g., a NP and a PP, as in 3b).

These three argument types of goals, paths and moved objects have been discussed in the thematic role literature in one form or another. Goals have been recognized as one of the most basic types of thematic roles since the early literature on thematic roles (Gruber 1965; Jackendoff 1972). The term "goal" has been used in a wider sense in this literature than I am using the term here; it has been used to include other types of terminal entities besides the spatial endpoint of a linear path involving distance. A moved object would be referred to in thematic role terms as a theme (although the term "theme" has not always been well-defined or used consistently). Gruber (1965:38) originally defined the theme as the "entity which is conceived as moving or undergoing transitions". Under this definition the moved object is a species of theme, in thematic role terms. A notion of path has been less central in the thematic role literature, but it has been developed in the work of Jackendoff and adopted and developed in the work of Verkuyl.[5] A path is not treated as a thematic role in this literature, but for Jackendoff, it is one element of the ontology that figures in the compositional makeup of Conceptual Structures. For Verkuyl the path is a function that maps an argument into a set of spatial points. This function figures in the mapping of spatial entities into temporal ones, and participates in the composition of terminative aspect. Verkuyl develops a semantics in which a spatial path may be mapped into a temporal path. The notion of path employed by Jackendoff and Verkuyl is essentially in the same spirit as the notion of path employed in this article. However, Jackendoff makes a distinction between bounded and unbounded paths; the path employed in this article is bounded. A bounded path may be thought of as a path which is totally "consumed" since the entire distance to the goal is traversed in the relevant

[5] See Jackendoff (1990) and Verkuyl (1993) for comprehensive introductions to the works of these authors.

interpretation. Verkuyl uses the idea of a path to discuss spatial paths, temporal paths, spatio-temporal paths, and "Thing-paths". In this article I am concerned only with bounded spatial paths.

To clarify that the argument types discussed here are associated specifically with a semantics involving translative motion along a bounded path to a definite goal, I will refer to them as the **SPATIAL-GOAL,** the **TRANSLATED-OBJECT:** and the **TOTAL-PATH.** Small caps will be used to clarify that these terms are being used in this very specific sense; no caps indicate that the terms are being used in a more general and informal sense, not necessarily associated with the specific translative motion reading focused on here. A **TOTAL-PATH** is therefore a type of path, but not all paths are **TOTAL-PATHS.** For instance ***the Long Trail*** is a path in both ***walk along the Long Trail*** and ***walk the Long Trail (to its end)*** while it is a **TOTAL-PATH** only in the latter. Likewise, a **TRANSLATED-OBJECT** is a type of moved object, but not all moved objects are **TRANSLATED-OBJECTS.** In ***Liza pushed the cart around, the curt*** is a moved object but not a **TRANSLATED-OBJECT** whereas in ***Liza pushed the cart to Ottawa, the cart*** is both a moved object and a **TRANSLATED-OBJECT.**

The translative motion reading may be associated with various combinations of these internal arguments (as well as the verb): a **TOTAL-PATH** with a SPATIAL-GOAL ***(walk the Long Trail to Canada),*** a path alone interpreted as a **TOTAL-PATH** ***(walk the Long Trail),*** or a **SPATIAL-GOAL** inside a path PP ***(walk to Canada).*** These three possible combinations of these internal arguments are associated with the translative motion reading. Each of these possible combinations is an example of what I will refer to as a **COMPLETE** PATH/GOAL complex.

The **COMPLETE** PATH/GOAL complex may optionally occur with these two classes of motion verbs, optionally introducing a sense of translative motion along a path to a definite goal. It can be identified as a distinct and, to some extent, independent component in the lexical semantics of verbs. This observation has been made in different ways by various authors, in the lexical semantics literature concerned with Conceptual Structures (Levin and Rapoport 1988; Jackendoff 1990; Cowper 1991; Carter 1988b, 1988c). Levin and Rappaport (1992) argue that verbs like ***walk*** are underspecified for this additional piece of semantic structure. They argue that these verbs acquire this additional structure from the material in the verb phrase, rather than carrying it in their basic lexical entries. This view

[6] Since in this paper I am specifically discussing objects moved in translative motion along some path to some goal, moved objects such as those in the following sentences (courtesy of an anonymous reviewer) are not **TRANSLATED-OBJECTS:**

(i) He entered the data.
(ii) He pumped the gas.
(iii) He lowered the box.

Double-object verbs (such as ***give*** in ***He gave me a sandwich)*** are also outside this discussion, since they do not belong to either of these two basic classes. Such verbs have a number of properties that make them quite distinct, which space prohibits my outlining here.

is also implicit in Jackendoff's **(1990)** treatment. Under this approach, which I adopt, the **COMPLETE PATH/GOAL** complex is an adjunct for these verbs.

This section has introduced translative motion, **TRANSLATED-OBJECTS, TOTAL-PATHS, SPATIAL-GOALS,** and the **COMPLETE PATH/GOAL** complex. The remainder of this article will focus on a comparison between **TRANSLATED-OBJECTS** and **TOTAL-PATHS.**

3. TRANSLATIVE MOTION AND ASPECTUAL STRUCTURE

In this section, aspectual structure will be briefly introduced. A fuller discussion of the literature on aspect, and the place in that literature of the aspectual structure employed here, is provided in the Appendix. This section will focus on the following ideas: (i) the **COMPLETE PATH/GOAL** complex is licensed by aspectual structure; and (ii) **TOTAL-PATHS** have aspectual roles while **TRANSLATED-OBJECTS** do not.

The **COMPLETE PATH/GOAL** complex is associated with the temporal and aspectual semantics of the sentence in a fundamental way. It makes the translative motion event a temporally bounded event, in which the path becomes a spatial measure of the event, which is translated into a temporal measure of the event.

Certain kinds of adverbial expressions can be used **as** diagnostics for temporal boundedness (Vendler **1967;** Dowty **1979).** Temporal expressions like ***in three duys*** occur in verb phrases referring to temporally bounded events, while expressions like *for* ***three duys*** occur in verb phrases referring to temporally unbounded events. These are illustrated below. Sentences (5a-d) below refer to temporally bounded events. Sentence (5a) is optionally bounded; the rest are obligatorily so, **as** attested by the possibility of attaching the adverbial ***in three months.***

(5) a. Laura walked the Long Trail for daydin three months.
b. Laura walked the Long Trail to the Canadian border *for daydin three months.
c. Laura walked to the Canadian border *for daydin three months.
d. Laura walked her bicycle to the university *for ten minutedin ten minutes?[7]

Sentence (6a) below refers to a temporally unbounded event, **as** attested by the possibility of attaching the adverbial *for* ***ten minutes.*** Sentences (6b) and (6d) are obligatorily bounded, and sentence (6c) is optionally bounded.

(6) a. Liza carried the package for ten minutes/*in ten minutes.
b. Liza carried the package to the university *for ten minutedin ten minutes.
c. Liza carried the package down the street for ten minutedin ten minutes.
d. Liza carried the package down the street to the university *for ten minutedin ten minutes.

[7] A temporally unbounded reading is possible in (d) for speakers who can understand the walking event as iterated; that is, Laura walked her bicycle to the university over and over for ten minutes. I focus here on the non-iterative readings.

The walking and carrying events described by the sentences above, in the temporally unbounded readings, continue for an indefinite duration. However, in the temporally bounded readings, the walking and carrying events continue for a certain definite duration of time, and terminate when the spatial endpoint of the journey is reached. The spatial and temporal termini of these events coincide. The SPATIAL-GOAL is the spatial terminus that also marks the temporal end of the journey. When Laura or Liza arrives at the Canadian border or the university, the walking or carrying event is concluded. The TOTAL-PATH also coincides with a temporal aspect of the event, as geographic or spatial progression along the path corresponds to temporal progression through the event. The walking and carrying events proceed in both temporal and spatial increments along ***The Long Trail to the Canadian border*** or ***down the street to the university.*** Certain segments of the Long Trail or the path to the university coincide with certain temporal segments of the walking and carrying events. The path may be thought of as providing a kind of measure or scale for the event, where progress in space and time are connected in the semantics. The path may also be thought of as a species of incremental theme (Dowty 1979). Finally, the TRANSLATED-OBJECT, the bicycle or the package, may be thought of as a kind of cursor, marking the progress of the event along the path. The event is "measured-out" along the TOTAL-PATH, to the SPATIAL-GOAL terminus, as marked by the TRANSLATED-OBJECT.[8]

The semantics of translative motion associated with the COMPLETE PATH/GOAL complex clearly has an aspectual component. I adopt a stronger view here, in which the COMPLETE PATH/GOAL complex is in fact introduced by the aspectual structure in the semantics. As part of this view, I assume that there is a distinct representation of event or aspectual structure, available in the semantics of natural language. This modularity of event or aspectual structure is in the spirit of much current research, which recognizes that there is a limited set of ways in which the lexical semantics of the predicates of natural language can structure events in time. This set of possible event structures seems to be universal and finite, which has made the modular approach to event structure attractive to many researchers.[9] Some of the details of this event or aspectual structure, such as, for example, what role the external argument plays in the event structure, are not relevant to the current discussion. What is relevant is the particular aspectual structure associated with translative motion, in which the spatial-path is mapped to a bounded temporal measure of the event. Any one of the representations of event structure in the literature could be adopted for the current discussion as long as this element of meaning is represented. The reader will find in the Appendix a fuller overview of the literature on aspect, and the place of this discussion in that literature.

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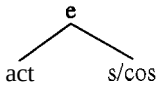
[8] Tenny (1994) provides a fuller discussion of "measuring-out."

[9] Pustejovsky (1991), Grimshaw (1990), and van Voorst (1988) have discussed event structure as a separate component in semantic representations.

For concreteness, I will adopt part of Grimshaw's (1990) version of aspectual structure. Grimshaw argues for an aspectual dimension of argument structure, in which there is "an event-structure template which is fixed for all predicates" (Grimshaw 1990:40). Grimshaw goes on to say, "The aspectual dimension, then, is a projection of an abstract event structure (e), which always includes two subparts, an activity (act) and a state or change of state (s/cos)":

(7)



In the complex event structure in (7), the change of state subpart of the event structure may be associated with the internal arguments of a transitive verb or with the internal argument of an unaccusative verb. Some unergative verbs may optionally have some added verb phrase material that may be associated with the change of state subpart of the event structure. The change of state marks the termination of the event, and forces it to be a temporally bounded event. In brief, the aspectual structure associated with translative motion is one instantiation of the change of state portion of the event structure in (7), where a change of location may be thought of as a change of state. The change proceeds along the path to the final state of location-at-the-goal. The path and the goal are crucial for this aspectual structure.[10] When this optional subpart of event structure is instantiated in the semantics of these verbs of motion, it is spelled out in the syntax by means of the COMPLETE PATH/GOAL complex. Under this view, the COMPLETE PATH/GOAL complex is licensed by aspectual structure. For clarity I will refer to this relevant portion of aspectual structure as the "aspectual structure associated with translative motion."

Of the three possible internal arguments associated with the translative motion reading of these verbs, only two are essential to the aspectual structure associated with translative motion; these are the TOTAL-PATHS and the SPATIAL-GOALS. TRANSLATED-OBJECTS are not essential for the COMPLETE PATH/GOAL complex. In the examples (5) and (6) above, the temporally bounded reading depends on the presence of the COMPLETE PATH/GOAL complex, which does not depend on the presence of a TRANSLATED-OBJECT. Examples (5b-d) and (6a, b, d), where the temporally bounded reading is obligatory, occur with a SPATIAL-GOAL and understood translative motion. Examples (5a) and (6c), where the temporally bounded reading is optional, occur with paths. In the temporally bounded interpretation of these sentences, the paths indicated by *the Long Trail* and *down the street* are understood as TOTAL-PATHS. Temporally bounded events of translative motion can occur with or without a TRANSLATED-OBJECT, as the two verb classes

[10] "There is more to say about how translative motion verbs are related to change of state verbs, but space prohibits my discussing this here. For a detailed discussion of this issue, see Tenny (1995).

examined here demonstrate. The TRANSLATED-OBJECT is not a necessary part of the translative motion semantics.

I will refer to the TOTAL-PATH and the SPATIAL-GOAL as aspectual roles by virtue of the roles they play in the aspectual structure associated with translative motion. These aspectual roles are assigned to syntactic elements by virtue of an aspectual structure which may be associated with a predicate. This makes aspectual roles comparable to thematic roles, which are assigned to NPs by virtue of the lexical properties of a predicate (see Tenny **1994** for a fuller development of aspectual roles). Because TOTAL-PATHS and SPATIAL-GOALS represent arguments in the aspectual structure associated with translative motion, they are aspectually licensed. TRANSLATED-OBJECTS, by comparison, are not aspectually licensed, since they are not essential to the aspectual structure associated with translative motion. They will be discussed in the next section.

4. TRANSLATED-OBJECTS: OBLIGATORY INTERNAL ARGUMENTS

In this section, the distribution of TRANSLATED-OBJECTS will be discussed, and the idea of thematic licensing will be compared with aspectual licensing. Section **4.1** demonstrates that TRANSLATED-OBJECTS are obligatory internal arguments for the verbs of imparting motion, but not for the verbs of consuming distance. Section **4.2** extends this observation to verbs such as *roll*. Section **4.3** introduces thematic licensing, and clarifies its relationship with aspectual licensing.

4.1. A difference between the verbs of consuming distance and the verbs of imparting motion

This section demonstrates that the difference between the verbs of consuming distance and the verbs of imparting motion is the presence or lack of an obligatory internal argument TRANSLATED-OBJECT. The verbs of imparting motion have an obligatory TRANSLATED-OBJECT and the verbs of consuming distance do not. This is deqonstrated by several tests.

The verbs of imparting motion are verbs that are basically transitive in the translative motion usage. They have an obligatory internal argument, representing a TRANSLATED-OBJECT, in the translative motion usage. The verbs of imparting motion correspond to two verb classes discussed in Levin **(1993):** the "carry verbs" and the "verbs of exerting force." These are verbs which can describe "the causation of accompanied motion" (Levin **1993:135–138),** and which do not imply any specific direction to the motion. These verbs have not generally been referred to as motion verbs in the literature." Some examples of these verbs from Levin's classes are given in Table **1** below.

[11] This is probably because when these verbs are used without a directional PP enforcing the translative motion reading, the object is not necessarily required to undergo any motion (e.g., *Mary* pushed her *car, but it didn't move).*

***Carry* verbs:**
carry, drag, haul, heave, hoist, kick, pull, push, shove, tow, tug
Verbs of exerting force:
heave, pull, push, shove, tug

Table 1: Verbs of imparting motion

Examples (8) and (9) below illustrate the obligatory status of TRANSLATED-OBJECTS with these verbs. In (8) there is no internal argument representing a TRANSLATED-OBJECT, and the resulting sentences are bad, whereas in (9) such an argument is present ***(the*** package) and the resulting sentences are good. The translative motion reading is forced by the PP ***to the comer.***

(8) Liza *carried/ *dragged/ *hauled/ *heaved/ *hoisted/ *kicked/ *pulled/ *pushed/ *shoved/ *towed/ *tugged to the comer.

(9) Liza carried/ dragged/ hauled/ heaved/ hoisted/ kicked/ pulled/ pushed/ shoved/ towed/ tugged the package to the comer.

The verbs of consuming distance are verbs that are basically intransitive in the translative motion usage. They are intransitive in the sense that they do not have an obligatory internal argument, as will be illustrated below. These verbs of consuming distance correspond to three classes of motion verbs discussed in Levin (1993): the ***run*** class of the "manner of motion verbs", the "verbs of motion using a vehicle", and the "waltz verbs". Some examples from Levin's three classes are illustrated in Table 2 below. (Levin has cross-classified some of these verbs.)

***Run* verbs:**
amble, bound, cavort, climb, crawl, dash, gallop, hasten, inch, jog, march, meander, plod, race, romp, scramble, scurry, shuffle, stagger, swim, tramp, travel, waddle, walk, zoom
Verbs of motion using a vehicle (verbs that are vehicle names):
bicycle, boat, bus, canoe, dogsled, ferry, helicopter, raft, skate, ski, taxi
Verbs of motion using a vehicle (verbs that are not vehicle names):
cruise, drive, fly, paddle, ride, row
***Waltz* verbs:**
boogie, dance, jitterbug, pirouette, rumba, squaredance, tango, tapdance, waltz

Table 2: Verbs of consuming distance

The reader will observe that the verbs of motion using a vehicle do have a sense in which an object other than the agent is moved along the path; the vehicle is moved ***(Laura drove her car to Canada).*** However these are classed with the verbs of consuming distance because the vehicle is not an obligatory argument.

The lack of an obligatory internal argument for the verbs of consuming distance is illustrated in (10) below. The verbs in (10) are not used with any **NP** representing a [illegible] and the resulting sentences are still good. Again, the translative motion usage is forced by the PP to ***her door.***

(10) Laura ambled bounded/ cavorted/ climbed/ crawled/ dashed/ galloped hastened/ inched jogged/ marched/ meandered/ plodded/ raced/ romped/ scrambled/ scurried/ shuffled staggered/ swam/ tramped traveled/ waddled/ walked/ zoomed/ bicycled/ boated/ bused/ canoed dogsledded/ ferried/ helicoptered/ rafted/ skated/ skied/ taxied/ cruised/ drove/ flew/ paddled/ rode/ rowed/ boogied/ bopped/ danced/ jitterbugged pirouetted/ rumba-ed/ squaredanced/ tangoed/ tapdanced/ waltzed to her door.

These two verb classes are diagnosed by the presence of an obligatory internal argument representing a **TRANSLATED-OBJECT** in the translative motion usage. The verbs of consuming distance never have an obligatory internal argument in this usage. They tend to be intransitive, but in some cases they may take an optional internal argument as in ***Laura drove her car to Canada.*** Verbs of consuming distance which are not felicitous with a **TRANSLATED-OBJECT** in the translative motion usage are illustrated in (11) below. Other verbs of consuming distance which may take a **TRANSLATED-OBJECT** are illustrated in (12a) and (12b) below. The presence of the PP to ***her door*** enforces the translative motion **reading.**[12]

(11) Laura *ambled/ *bounded/ *cavorted/ *climbed/ *crawled/ *dashed/ ?hastened/ *inched/ ?jogged/ *meandered/ *plodded/ *romped/ *scrambled/ *scurried/ *shuffled/ *staggered/ *tramped/ *traveled/ *waddled/ *zoomed/ *boated/ *bused/ ?dogsledded/ ?skated/ ?skied/ ?taxied *cruised/ *boogied/ *bopped/ ?tapdanced/ her friend to her door.

(12) a. Laura marched/ walked/ bicycled boated/ canoed/ ferried/ helicoptered/ drove/ flew/ paddled/ rowed/ danced/ waltzed her friend to her door,

b. Laura galloped/ rode/ swam/ raced/ her horse across the river.

The difference between the verbs of consuming distance and the verbs of imparting motion surfaces even when the verbs of consuming distance are used with these optional internal arguments. Levin (1993) refers to the alternation illustrated in ***Laura marched/Laura marched her sister to the door*** as the induced action alternation, and observes that in this alternation "the causee is typically an animate volitional entity that is induced to act by the causer" (Levin **1993:31**).[13] Note that some sort of shared agentivity is implied as well when the **TRANSLATED-OBJECT** is an inanimate vehicle, as in ***Laura drove her car to Canada.*** Levin

[12] The judgements given here are the author's, and it is expected that there will be a certain amount of speaker variation with these judgements. The reader may find different subsets of the verbs of consuming distance that have optional internal arguments. This does not affect the discussion here.

[13] The causee in this case is therefore not, strictly speaking, a TRANSLATED-OBJECT.

also observes that the induced action alternation differs from other causative alternations in that an explicit or implicit directional phrase is required in the transitive causative use. For example, ***Laura ambledlinched her sister*** is bad without a directional PP and in ***Laura walked her dog*** some sort of translative motion is implied, even if not to a definite goal. These properties do not hold of the verbs of imparting motion. Animacy or volition is not required of the internal argument, as the reader can ascertain for him or herself. And no directional phrase, or even implicit directional motion is required for the verbs of imparting motion (***Liza pushed the rock but it didn't move***).[14]

It is worth noting that whether these verbs take a direct internal argument or not may vary when the verbs are used in other ways besides the translative motion usage. When used as bare verbs without a PP enforcing a translative motion reading, the verbs of consuming distance tend to be intransitive, but they are not always so. Most of them are completely natural in an intransitive usage (***Laura walked/ Laura drove/ Laura waltzed***), but some of them are somewhat awkward. (According to the author's judgements, ****Laura inched*** is bad, even though ***Laura inched to the door*** is fine.)

In the same vein, the verbs of imparting motion are not always transitive. Most of the verbs of imparting motion are not felicitous when used as bare verbs without an internal argument (in the author's judgements: ****Liza carried/ *Liza***

[14] For some speakers, the induced action alternation seems to be related to a further difference between the two verb classes. The verbs of imparting motion are felicitous with a coreferential interpretation of NPs in a sentence like ***Liza$_i$ dragged/ pulled/ tugged/ shoved rhe visitor to the door wirh her$_i$***. With a verb like ***shove,*** the sentence is interpreted as meaning something like 'Laura traveled to the door, while shoving the visitor along in front of her'. However, the comparable structure with the verbs of consuming distance, where they are used with the induced action alternation, is not felicitous for many speakers (****Laura$_i$ walked/ drove/ marched the visitor to the door with her$_i$***).

A few qualifications are necessary. First of all, these judgements involving pronominal coreference are subtle and only a subset of native speakers get them. Secondly, the coreferential interpretation with the verbs of consuming distance improves with emphasis on the ***with,*** so the two classes must be compared without such an emphasis. Compare (i) with (iia) and (iib):

(i) **Liza$_i$** carried the package to the door with **her$_i$**.
(ii) a. ***Laura$_i$** drove the package to the door with her$_i$.
b. ?Laura$_i$ drove the package to the door **WITH** her$_i$.

The coreferential interpretation with the two verb classes, for some speakers, brings out this difference between the verbs of imparting motion and the verbs of consuming distance. The relationship between this interpretation and the induced action alternation is an interesting problem which I will not pursue here.

Levin **(1993)** employs the coreferential interpretation as a criterion for some of her verb classes, although she does not apply it to the verb classes defined here.

dragged1 **Liza* hauled), but a few of them may be used intransitively (Laura *pulled*/ Laura ***pushed***).[15]

Although the transitivity of the two verb classes may vary when considered in usages other than the translative motion usage, the transitivity established in the translative motion usage is basic in some sense because it is sustained in two other tests that distinguish these classes: there-insertion and locative inversion. The verbs entering into these constructions are prototypically intransitive verbs of existence and appearance (Levin **1993:88–94).** Verbs of imparting distance, being transitive, cannot undergo there-insertion and locative inversion, while verbs of consuming distance can undergo these **alternations.**[16] Example (13) below shows that the verbs of imparting motion do not undergo there-insertion, and **(14)** shows that the verbs of consuming distance do undergo there-insertion.

(13) *There carried dragged hauled heaved hoisted/ kicked/ pulled/ pushed/ shoved/ towed tugged down the street a man in a black felt hat.

(14) There ambled bounded/ cavorted/ climbed crawled/ dashed galloped hastened inched/jogged/ marched/ meandered/ plodded/ raced/ romped/scrambled/ scurried/ shuffled/ staggered swam/ tramped/ traveled waddled/ walked/ zoomed bicycled/ boated/ bused/ canoed/ dogsledded ferried/ helicoptered/ rafted/ skated/ skied/ taxied cruised drove/ flew/ paddled rode/ rowed/ boogied bopped/ danced/ jitterbugged/ pirouetted/ rumba-ed/ squaredanced/ tangoed/ tapdanced waltzed down the street a man in a black felt hat.

Example **(15)** below shows that the verbs of imparting motion do not undergo locative inversion, and (16) shows that the verbs of consuming distance do undergo locative inversion.

(15) *Out of the house carried/ dragged/ hauled/ heaved/ hoisted/ kicked/ pulled/ pushed/ shoved/ towed/ tugged a man in a black felt hat.

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[15] The verbs of imparting motion may be used as bare verbs in a generic usage, as in *Liza carried/ hauled for a* ***living.*** We may also find them used as bare verbs in expressions like the following (courtesy of an anonymous reviewer), where they are used to mean something like 'Mary did a kicking' or 'Mary did a pushing':

(i) a. Don't push.
b. Don't kick.
c. The soccer player kicked but misjudged the distance.
d. Kick hard.
e. Push hard.

[16] **Two** interesting points must be noted here. First, the motion element of meaning in the verbs of consuming distance can apparently be understood as a type of appearance or existence, an interesting fact which I will not pursue here. Second, since the transitivity or intransitivity of these two verb classes depends on the translative motion reading, this suggests that *there*-insertion and locative inversion also depend on the translative motion reading in some way.

(16) Out of the house ambled/ bounded/ cavorted/ climbed/ crawled/ dashed/ galloped/ hastened inchedjogged/ marched/meandered/ plodded/raced/ romped/scrambled/ scurried/ shuffled/ staggered swam/ tramped/ traveled/ waddled/ walked/ zoomed/ bicycled/ boated/ busedl canoed/ dogsledded/ ferried/ helicoptered/ rafted/ skated/ **skied/** taxied/ cruised/drove/ flew/ paddled/ rode/ rowed/ boogied/ bopped/ danced/ jitterbugged/ pirouettedl rumbaed/ squaredanced/ tangoed/ tapdanced/ waltzed a man in a black felt hat.

The verbs of imparting motion and the verbs of consuming distance can be distinguished by the presence or absence of a direct internal argument, when the verbs are used with a PP indicating a goal, in an interpretation implying some translative motion along a path to a goal. The presence or absence of an obligatory internal argument **TRANSLATED-OBJECT** minimally distinguishes these two classes. To the best of my knowledge, these two verb classes have not been defined along these lines or compared in these ways in the literature.

4.2. The roll verbs

This section shows that verbs like ***roll,*** which at first glance seem to confound the distinction between the verbs of consuming distance and the verbs of imparting motion, fit into this distinction if we understand that there is more than one ***roll*** verb.

The ***roll*** verbs constitute one of the manner-of-motion verb classes in Levin **(1993).** Some examples from Levin's class are: ***roll, drift, glide, move, slide, swing, revolve, rotate, coil, spin, twist, twirl,*** and ***whirl.*** Some of these verbs have interesting properties cross-cutting the two classes of the verbs of consuming distance and the verbs of imparting motion, and in fact seem to belong to both classes, according to the diagnostics outlined in the previous section. However they do not cause a problem for this verb class distinction if we understand that there is more than one *roll* verb.

Roll may be used **as** a single-argument verb; but **as** a single-argument verb it has two different versions: the unergative and the unaccusative versions. Its single argument may be an agent (linked to the external argument) in the case of the unergative verb, or it may be a moved object or a **TRANSLATED-OBJECT** (linked to the internal argument) in the case of the unaccusative **verb.**[17] These two possibilities are illustrated below. *Laura* is an agent in **(17)** and *the package* is a **TRANSLATED-OBJECT** in (18).

(17) unergative roll:
Laura rolled (deliberately down to the bottom of the hill).

(18) unaccusative roll:
The package rolled (down to the bottom of the hill).

[17] **Rappaport** Hovav and Levin (in press) classify the roll verbs **as** basically unaccusative verbs, while commenting on the dual nature of these verbs.

We would expect the unergative roll verbs to behave like the verbs of consuming distance, which are also unergative and agentive. Unergative roll verbs are felicitous in the translative motion reading, without a moved object or a **TRANSLATED-OBJECT:**

(19) unergative roll
Laura deliberately drifted/ dropped/ glided/ moved/ rolled/ slid/ swung/ revolvedl rotated coiled/ spun/ twisted/ twirled/ whirled to the bottom of the hill.

(The pragmatics of ***coiled to*** the *bottom of the* hill presents some challenge to the imagination, but the expression is a possible one.)

The unaccusative roll is a slightly different beast from the two verb classes defined here, since it is intransitive and non-agentive, having **an** internal argument but no external argument; whereas the verbs of consuming distance have an external argument but no obligatory internal argument, and the verbs of imparting motion have both an external argument and an obligtory internal argument. Because of the intransitive nature of unaccusative *roll* it patterns with the verbs of consuming distance, **as** we **see** in (20) below. The criterion of intransitivity discussed in the previous section does not distinguish between the two intransitive roll verbs.

(20) unaccusative roll
The package drifted/ dropped/ glided/ moved/ rolled/ slid/ swung/ revolved/ rotated/ coiled/ spud twisted/ twirled/ whirled to the bottom of the hill.

As with the verbs of consuming distance, sentences with roll can undergo *there*-insertion (21) and locative inversion (22). The roll in **(21)** and (22) below appears to be the unaccusative *roll.*[18]

(21) There drifted/ dropped/ glided/ moved/ rolled/ slid/ swung/ coiled/ revolvedl rotated/ spun/ twisted/ twirled/ whirled down the street a man in a black felt hat/an oddly shaped package.

(22) Out of the house drifted/ dropped/ glided/ moved rolled/ slid/ swung/ coiled/ revolved/ rotated/ spun/ twisted/ twirled/ whirled a man in a black felt hat/an oddly shaped package.

However, a number of Levin's class of roll verbs can also be used as transitive verbs. In this usage they behave like the verbs of imparting motion. Like the

[18] **This** is because of the lack of apparent agentivity associated with ***a man in a black felt hat.*** (With ***there-insertion: ?*There deliberately twirled down the street a man in a black felt hat/ ?*There twirled deliberately down the street a man in a black felt hat.*** With locative inversion: ***?*Out of the house deliberately twirled a man in a black felt hat/ ?*Out of the house twirled deliberately a man in a black felt hat.)*** The use of unaccusative ***roll*** with there-insertion and locative inversion is consistent with some authors who have suggested that these alternations take unaccusative verbs (among others, Burzio **1986,** Bresnan **1990,** Hoekstra and Mulder **1990).** However, whether the ***roll*** in these examples is the unaccusative roll or not does not affect the discussion in this paper.

verbs of imparting motion, these transitive verbs are felicitous with a TRANSLATED-OBJECT. In the author's judgement, the verbs in (23) below can be used transitively.

(23) Liza dropped moved rolled/ slid swung/ coiled spun/ twisted/ twirled/ whirled the package to her door.[19]

The transitive *roll* verbs belong to the class of the verbs of imparting motion, even though the TRANSLATED-OBJECT the *package* in (23) above is optional, in the sense that the same sentence without it is an acceptable sentence. The acceptable sentence without the package involves a different verb ***roll***.[20]

4.3. TRANSLATED-OBJECTS as thematically licensed arguments

Section 3 showed that TRANSLATED-OBJECTS are not necessary elements for the aspectual structure associated with translative motion. They are not therefore present in the sentence by virtue of any aspectual role they have. Rather, with the verbs of imparting motion, TRANSLATED-OBJECTS are present because they are an essential and obligatory participant in the event described by the verb, which cannot be predicted through any other means than the verb itself. This is, for practical purposes, parallel to the traditional notion of the assignment of an obligatory thematic role by the verb. I will call this "thematic licensing." The degree of semantic selection evidenced by the verb for its argument is one ingredient in thematic licensing, since semantic selection is information not predictable from anything outside the verb. Less semantic selection is involved in acquiring TOTAL-PATHS or SPATIAL-GOALS, since all that is required in the verb's basic sense is motion (and sometimes not even that: The ***wagon rattled into town).***

Thematic licensing differs from aspectual licensing because an element aspectually licensed plays a role in an aspectual structure that is part of a limited

[19] A reviewer has pointed out that sentences like those in (23) seem to be more felicitous with the addition of a path or goal, compared with the other verbs of imparting motion (e.g., *?Liza slid the package/* ***Liza slid the package into the corner).*** This might be due to the derived nature of these verbs. The derived transitive use of the verbs is more transparent if translative motion is invoked. However this is merely a speculative answer to an interesting observation, which deserves more investigation.

[20] The transitive ***roll*** verbs provide an apparent example of derived verbs of imparting motion. The transitive ***roll*** verbs appear to be derived by adding an external argument to unaccusative ***roll,*** rather than by adding an internal argument to unergative ***roll.*** The **TRANSLATED-OBJECT** internal argument in the transitive verbs does not pattern with the **TRANSLATED-OBJECT** that may be added to some of the unergative verbs of consuming distance through the induced action alternation. Animacy or agentivity is not required to make it natural and felicitous (as we can see by the felicitous use of ***the package*** in (23), instead of, for instance, ***the man).*** Furthermore, the transitive version of ***roll*** is relatively productive compared with the induced action alternation in the verbs of consuming distance, where the alternation shows more of the variability in productivity associated with lexical operations.

set of possible aspectual or event structures available for all verbs. It is at least partially predictable from something outside the verb. However, what aspectual structures may be associated with what kind of verbs is due in part to information particular to the verb itself. Both of the verb classes under discussion here involve some sense of motion or potential motion; that is why they may take the aspectual structure associated with translative motion as an adjunct. Under this view, the verb ***walk*** in ***Laura walked*** contains the basic thematic information that predicts it may have an adjunct aspectual structure associated with translative motion, **as** in ***Laura walked to the store.*** The aspectual adjunct in turn determines what kind of elements it may introduce, such as **TOTAL-PATHS** or **SPATIAL-GOALS.** Aspectually licensed arguments are therefore indirectly thematically licensed as well. This modularity is important:[21] an element could be both directly thematically licensed and aspectually licensed, if it were an obligatory element of the event described by the verb, with very particular selectional requirements, and it received an aspectual role such as a **TOTAL-PATH** (e.g., ***the desert*** in ***Laura crossed the desert in three days).*** With the verbs under discussion here, however, the translative motion aspectual structure is not obligatory but optional, so with these verbs only **TRANSLATED-OBJECTS,** and **not TOTAL-PATHS** or **SPATIAL-GOALS,** are directly thematically licensed.

5. PATHS: ARGUMENTS OR ADJUNCTS?

Section **4** showed that **TRANSLATED-OBJECTS** are obligatory internal arguments for the verbs of imparting motion, but not for the verbs of consuming distance. The difference between the two classes can be minimally characterized in this way. In this section the occurrence of **TOTAL-PATHS** with the two verb classes in the translative motion reading will be examined. Section **5.1** shows that **TOTAL-PATHS** are more adjunct-like than **TRANSLATED-OBJECTS** with these verbs, in that they cannot occur where there is already an internal argument present. Section **5.2** will show that a certain type of **TOTAL-PATH** (which I will refer to as distance noun phrases) demonstrate even more adjunct-like properties.

5.1. Distribution of TOTAL-PATH NPs

The distribution of **TOTAL-PATHS** is quite different **from** that of **TRANSLATED-OBJECTS,** which was outlined in section **4.** Both verb classes can occur with PPs

[21] Ritter and Rosen (1993, 1994) also advocate a kind of modularity in their distinction between thematic and aspectual arguments, which they apply to external rather than internal arguments. In these articles they argue that some causer arguments are licensed by the aspectual structure of the event, rather than by the lexical semantics of the specific verb. These arguments would not be represented in the verb's basic lexical semantics. For example, in ***The psychologist ran the rats through the maze, the psychologist*** would be an aspectual argument, and not a thematic one.

indicating TOTAL-PATHS, but NPs representing TOTAL-PATHS occur only with the verbs of consuming distance. (I will refer to noun phrases representing TOTAL-PATHS as TOTAL-PATH NPs.) Some verbs of consuming distance are felicitous with TOTAL-PATH NPs, but no verbs of imparting motion are felicitous with TOTAL-PATH NPs.

The verbs of consuming distance in **(24)** and ***(25)*** below are felicitous with TOTAL-PATH NPs such as ***The Long Trail*** or ***the course.***

(24) Laura walked the Long Trail.

(25) Laura climbed jogged/ swam/ traveled/ walked/ bicycled/ canoed/ skied/ drove/ flew/ paddled rode/ waltzed the course.[22]

None of the verbs of imparting motion are felicitous with TOTAL-PATH NPs:

(26) *Liza carried/ dragged/ hauled/ heaved/ hoisted/ kicked/ pulled/ pushed/ shoved/ towed tugged the course.

That (26) is not possible is not surprising in light of the fact that the verbs of imparting motion have obligatory TRANSLATED-OBJECTS in the translative motion usage. However, trying various options with the TRANSLATED-OBJECT present as a second post-verbal NP still does not make the sentence possible. These verbs do not occur with TOTAL-PATH NPs:

(27) *Liza carried/ dragged/ hauled/ heaved/ hoisted/ kicked/ pulled/ pushed/ shoved/ towed/ tugged the package the course.

(28) *Liza carried dragged hauled heaved/ hoisted kicked/ pulled/ pushed/ shoved/ towed/ tugged the course the package.

(29) *Liza carried/ dragged hauled heaved/ hoisted/ kicked/ pulled/ pushed/ shoved towed/ tugged the course with the package.

Like the verbs of imparting motion, the unaccusative roll verbs never take TOTAL-PATH NPs. In the non-agentive unaccusative reading, (30) below is clearly unacceptable.

(30) *The package drifted/ dropped/ glided/ moved/ rolled/ slid/ swung/ rotated coiled revolved rotated/ spun/ twisted/ twirled/ whirled the course.

The transitive roll verbs, being verbs of imparting motion, also cannot occur with TOTAL-PATH NPs:

(31) *Liza dropped/ moved/ rolled/ slid swung/ coiled/ spun/ twisted/ twirled/ whirled the package the course.

(32) *Liza dropped/ moved rolled slid swung/ coiled/ spun/ twisted/ twirled/ whirled the course the package.

[22] Levin **(1993)** refers to alternations such as ***Martha climbed up the mountain/ Martha climbed the mountain*** as the locative preposition drop alternation. The examples in **(25)** may be thought of as instances of this phenomenon.

(33) *Liza dropped/ moved/ rolled/ slid/ swung/ coiled/ spud twisted/ twirled/ whirled the course with the package.

With the unergative *roll* verbs, TOTAL-PATH NPs are more felicitous than with the unaccusative *roll* verbs, but they require the speaker to understand *roll* as some interesting manner of agentive motion: ***Laura decided to roll the course, instead of walking it; Laura deliberately slid the course, instead of walking it.*** In the author's judgements the verbs in (34) may be used in this way.

(34) Laura deliberately glided/ moved/ rolled/ *slid* swung/ spud twisted/ twirled/ whirled the course.

For some of these verbs there is also a strong interference from the transitive *roll,* which suggests a reading in which the course is not a TOTAL-PATH NP but some kind of moved object. This makes the TOTAL-PATH interpretation in (34) less acceptable.[23] Nevertheless, the reader should compare (34) with (30) to see that unergative *roll* can be forced into a reading with a TOTAL-PATH NP object, more easily than unaccusative *roll.*

This section has shown that TOTAL-PATH NPs cannot occur with the verbs of imparting motion, the transitive *roll* verbs, and the unaccusative *roll* verbs. They can occur with the verbs of consuming distance and with the unergative *roll* verbs, although these sentences may be somewhat awkward or require a stretch of the imagination. This distribution of TOTAL-PATH NPs shows that they cannot occur where there is an obligatory internal argument. This is presumably because there is no secondary case available from the verb for these TOTAL-PATH NPs, since the sole available case must be assigned to the obligatory TRANSLATED-OBJECT, or in the case of the unaccusative *roll* verbs, presumably there is no case available for the verb to assign due to Burzio's (1986) generalization. From the point of view of distribution, TOTAL-PATH NPs are more adjunct-like than TRANSLATED-OBJECTS with these verb classes.

5.2. Distance noun phrases

In this section a kind of TOTAL-PATH NP is examined, which I will refer to as a distance noun phrase. Distance NPs are interesting for two reasons. First, whereas only the verbs of consuming distance occur with the TOTAL-PATH NPs discussed in the previous section, both verb classes can occur with distance NPs. Secondly, although these two types of NPs share the aspectual role of TOTAL-PATH, a number of tests for adjunct versus argument status show that the distance NPs are clearly more adjunct-like than the TOTAL-PATH NPs discussed in section 5.1.

[23] Pustejovsky (1993:83) discusses "type coercion: a semantic operation that converts an argument to the type which is expected by a function, where it could otherwise result in a type error." He invokes two principles: "(a) All lexical items exhibit some degree of logical ambiguity; (b) Some lexical items act to coerce the denotations of other items" (Pustejovsky 1993:85). Something like this appears to be at work here.

To distinguish the **TOTAL-PATH NPs** discussed in section **5.1** from the distance NPs discussed in this section, I will refer to the **TOTAL-PATH NPs** discussed in section **5.1 as** referential **TOTAL-PATH NPs.**

Distance NPs represent some distance associated with a **TOTAL-PATH.** Although they seem somewhat adverbial in function, distance NPs have the internal structure of noun phrases, and they appear in an object-like position in the verb phrase. An expression like the length *of the field* in (35a) illustrates a distance NP.

(35) a. **Mary** walked **[NP** the length of the field]
b. Susan ambled **[NP** the whole distance home]
c. Jane canoed **[NP** the distance required to tie for second place]
d. Jack bounced **[NP** the length of the stairs]

The examples in (35) above show that distance NPs occur quite naturally with verbs of consuming distance. Distance NPs can also occur with the verbs of imparting motion, as is shown in (36) below. Compare (36) with (26) through (29), which showed that referential **TOTAL-PATH NPs** cannot be added to these verbs.

(36) a. **Mary** kicked the ball [NP the length of the field]
b. Susan pushed the car **[NP** the whole distance home]
c. Liza carried/ dragged/ hauled/ heaved/ hoisted/ pulled shoved/ towed/ tugged the package **[NP** the mile and a half to her door]

All three kinds of *roll* verbs can also occur with distance noun phrases:

(37) unergative ***roll:***
a. The mountaineer deliberately rolled the whole distance down the hill.
b. The student deliberately rolled the length of the playing field.
c. The child deliberately rolled the whole distance across the room.

[4] unaccusative ***roll:***
d. The boulder rolled the whole distance down the hill.
e. The boulder slid the length of the icepatch.
f. The frisbee spun the whole distance across the field.
g. The boomerang rotated the whole six hundred yards to its target.
h. The shack moved the length of the yard in the big earthquake.
i. The pendulum swung the whole distance across the room.

transitive ***roll:***
j. The mountaineer rolled the boulder the whole distance down the hill.
k. The student spun the frisbee whole distance across the field.

Unlike referential TOTAL-PATH NPs, distance NPs are not sensitive to the existence of an obligatory internal argument. Apparently, distance NPs do not need to be assigned case directly from an adjacent case assigner; this suggests that they receive inherent case. The interesting question is raised, which I will not solve, of how these NPs receive their inherent case.[24] I will suggest, however, that the ability of these NPs to take inherent case is related to the property of being a measure.

The distinction between referential TOTAL-PATH NPs and distance NPs is a distinction in the degree of referentiality encoded in the noun phrase. Referentiality interacts with a number of adjunct-like properties (Cinque 1990; Rizzi 1990). Distance NPs can be shown to be more adjunct-like than referential TOTAL-PATH NPs in a number of ways. A number of tests illustrate the adjunct-like nature of distance NPs compared to the more argument-like nature of referential TOTAL-PATH NPs. Long distance extraction gives a clear distinction between the two kinds of NPs. Some other tests for argument status that have been used in the literature (passivization, middle formation, pronominalization, and topicalization) show a degradation of argument status with the distance NPs rather than a clear distinction between argument and non-argument status.

Cinque (1990) argues that long-distance wh-movement of the kind illustrated in (38) below can only apply to phrases which are arguments and which are referential. This long distance extraction is possible with referential TOTAL-PATH NPs (38) but not with distance NPs (39).

(38) Which course do you wonder whether Laura climbed/ jogged/ swam/ traveled walked/ bicycled canoed skied/ drove/ flewl paddled/ rode/ waltzed?

(39) a. *How much length of the field do you wonder whether Mary walked?
b. *What distance home do you wonder whether Susan ambled?
c. *What distance do you wonder whether Jane canoed?
d. *How much length of the stairs do you wonder whether Jack bounded?

Massam (1990) uses passivization, topicalization and pronominalization as tests for argument status in her investigation of cognate objects. Examples (40)–(42) show that referential TOTAL-PATH NPs are argument-like in that they can be passivized (40), topicalized (41) and pronominalized (42), while examples (43)–(45) show that distance NPs are more adjunct-like in that they degrade when they undergo these operations. The examples in (43)–(45) represent the author's judgements. These judgements may vary from speaker to speaker, but they do illustrate the relative degradation of the distance NP sentences.

[24] See Larson (1985) for discussion of related (but different) bare NP adverbs, and their case properties. Larson discusses bare NP adverbs such as, for instance, *that day* in *Mary walked anxiously that day, looking for her lost cat.* These bare NP adverbs share some properties with distance NPs, but space prohibits my outlining them here.

(40) The course was climbed/ jogged/ swum/ traveled/ walked/ bicycled/ canoed/ skied/ driven/ flown/ paddled/ ridden/ waltzed by Laura.

(41) a. The course, Laura climbed/ jogged/ swam/ traveled/ walked/ bicycled/ canoed/ skied/ drove/ flew/ paddled/ rode/ waltzed.

b. The Long Trail, Laura walked.

(42) Laura walked the course, and Mary bicycled it.

(43) a. ?The length of the field was walked by Mary.

b. *The whole distance home was ambled by Susan.

c. ?The distance required to tie for second place was canoed by Jane.

d. *The length of the stairs was bounded by Jack.

(44) a. ?The length of the field, Mary walked.

b. ?The distance home, Susan ambled.

c. The distance required to tie for second place, Jane canoed.

d. *?The length of the stairs, Jack bounded.

(45) a. Mary walked the length of the field and Laura bicycled it.

b. ?Susan ambled the distance home and Lary jogged it.

c. Jane canoed the distance required to tie for second place, and Lucy kayaked it.

d. ?Jack bounded the length of the stairs, and Jill leaped it.

Carrier and Randall (1992) employ middle formation as a test for the existence of a direct internal argument, since middle formation is an operation involving the externalization of an internal argument. The examples below show that middles, somewhat possible with referential TOTAL-PATH NPs (46), degrade with distance NPs (47). The judgements below are the author's. Since judgements on middles are notoriously variable, the reader may find him or herself with a different set of judgements. It is expected that the general trend will be apparent for most speakers. Examples (46) illustrate middles with referential TOTAL-PATH NPs, and (47) illustrate middles with distance NPs.

(46) a. ?This course walks easily.

b. ?This stream canoes easily.

c. This trail skies easily.

(47) a. ?*The length of the field walks easily.

b. *The distance home ambles easily.

c. *The distance required to tie for second place canoes easily for a strong paddler.

d. *The length of the stairs bounds easily.[25]

[25] Another test for the internal argument status employed by Carrier and Randall (1992) is adjectival passive formation. This test gives mixed results. Adjectival passives are possible with referential TOTAL-PATH NPs *(This is an easily walked trail).* Adjectival passives are also possible with paths of pure distance *(This is an easily walked distance).* But for some

There is a slightly higher degree of semantic selection involved in referential paths than with non-referential ones. A referential path like the ***ladder,*** for example, in ***Susan climbed the tallest ladder she could find***, is more than just a measure of distance, but an object referred to by the sentence. Moreover it is the kind of thing one climbs, and therefore the verb ***climb*** semantically selects for the ***ladder.*** A distance, on the other hand, is more neutral with respect to the mode of travel indicated by the verb, and is less directly referential. Examples **(48)** and **(49)** show that some difference in semantic selection (though not a lot) can be found. The referential TOTAL-PATH NPs in **(48)** show slightly more semantic selection than the distance NPs in (49).[26]

(48) a. Laura walked the course/ the field/ *the river/ *the ladder.
b. Laura swam the course/ *the field/ the river/ *the ladder.
c. Laura climbed the course/ *the field/ *the river/ the ladder.

(49) a. Laura walked the entire distance/ the whole way home.
b. Laura swam the entire distance/ the whole way home.
c. Laura climbed the entire distance/ the whole way home.

To summarize this section, distance NPs can occur with existing internal arguments, and referential TOTAL-PATH NPs cannot, pointing to a case difference between the two types of noun phrases. Distance NPs receive inherent case, and TOTAL-PATH NPs receive structural case. Distance NPs are also more adjunct-like than referential TOTAL-PATH NPs with respect to long-distance extraction, passivization, topicalization, pronominalization, and middle formation. Passivization, topicalization, pronominalization, and middle formation show that the distinction between referential TOTAL-PATH NPs and distance NPs is a gradational rather than a discrete difference. Semantic selection plays some role in referentiality.

6. SUMMARY AND THEORETICAL IMPLICATIONS

The following points have been made in the preceding sections of this article:

- Section 3 argued that the COMPLETE PATH/GOAL complex is licensed by the aspectual structure associated with translative motion. This aspectual structure is the adjunct, and the COMPLETE PATH/GOAL complex, with its path and goal arguments, is a spellout of that aspectual structure. Various optional arrangements of paths and goals are possible within the COMPLETE PATH/GOAL complex.

reason, to the ear of this author, they degrade with more complex distance NPs (**This is an easily walked length of the field*). Apparently some other constraints on adjectival passive formation are at work here.

[26] Some semantic selection carries over directly from TOTAL-PATH NPs to distance NPs: ***Laura walked the length of the course/ the field/ *the river/ *the ladder.***

- Furthermore, TOTAL-PATH NPs are aspectually licensed by virtue of the role they play in the aspectual structure of translative motion. With these verbs, TOTAL-PATH NPs are in fact arguments of an adjunct aspectual structure. They are indirectly licensed by the verb's thematic structure.
- Section 4 demonstrated that TRANSLATED-OBJECTS are obligatory internal arguments of the verbs of imparting motion, and that the two verb classes differ minimally on this point. These TRANSLATED-OBJECTS are arguments in the traditional sense, being necessary participants in the event described by the verb, and being semantically selected for by the verb directly. They are directly thematically licensed, and they are not aspectually licensed.
- Section 5.1 demonstrated that referential TOTAL-PATH NPs cannot occur where there is an existing internal argument.
- Section 5.2 demonstrated that within the class of TOTAL-PATH NPs, more and less argument-like NPs can be distinguished, depending on the degree of referentiality. Distance NPs, which are less referential, can occur with an existing internal argument.

The properties of TRANSLATED-OBJECTS, TOTAL-PATHS and SPATIAL-GOALS, with these two classes of translative motion verbs, illustrate the effects of several factors on the argument-like nature of these elements.

First of all, there is the modularity between thematic and aspectual licensing. For these verbs, TRANSLATED-OBJECTS are thematically licensed directly by the verb, while TOTAL-PATHS and SPATIAL-GOALS are licensed directly by aspectual structure and are only indirectly thematically licensed. The aspectual structure associated with translative motion, and hence the COMPLETE PATH/GOAL complex, is a thematically licensed adjunct for these verbs. This explains why TOTAL-PATHS and SPATIAL-GOALS are optional where TRANSLATED-OBJECTS are not. This modularity between thematic and aspectual licensing allows for a very simple statement of the difference between the verbs of imparting motion and the verbs of consuming distance; they are identical in their aspectual licensing properties, but differ in the thematic licensing of a moved object. This also allows a unified statement of all the various possible combinations of paths and goals that can occur with these verbs, since these combinations are predicted by the aspectual structure associated with translative motion. An approach to these phenomena that does not employ a modularity between thematic and aspectual licensing would not succeed in associating the relevant combinations of paths and goals with the translative motion reading, nor would it group these elements together naturally as adjunct material.

Secondly, there is the difference between referential TOTAL-PATH NPs and distance NPs, according to a number of tests which show the referential TOTAL-PATH NPs to be more argument-like, and the distance NPs to be more adjunct-like in their behaviour. These differences seem to be attributable to the degree of

referentiality; the more referential the NP, the more argument-like its behaviour. Referentiality seems to be a graded rather than an absolute property; likewise the tests that differentiate the distance NPs from the referential TOTAL-PATH NPs indicate a degradation of argument-status, rather than a simple binary distinction between arguments and non-arguments.

Thirdly, there is the distributional difference between referential TOTAL-PATH NPs and distance NPs, with respect to what verb classes they may occur with. The referential TOTAL-PATH NPs need to receive structural case from a case assigner, while the distance NPs have inherent case and do not need to be adjacent to the verb. This explains why TOTAL-PATH NPs cannot occur with an existing internal argument whereas the distance NPs can do so.

This three-way distinction in contributing properties to argument-like behaviour — thematic versus aspectual licensing, referentiality, and case assignment — gives several degrees of freedom, which account for the facts outlined in sections 2–5. This is illlustrated in Table 3.

	TRANSLATED-OBJECTS	TOTAL-PATHS	distance NPs
Licensing	thematic	aspectual	aspectual
Referentiality	referential	referential	non-referential
Case	structural	structural	inherent

Table 3: Three parameters contributing to argument-like behaviour

The degree of referentiality and structural versus inherent case assignment would seem to be redundant information in Table 3. But their separate contributions are apparent when we consider the cognate objects discussed in Massam (1990). Massam shows that cognate objects such as *a silly smile* in ***Maggie smiled a silly smile*** do not undergo passivization, topicalization or pronominalization. They also do not undergo long distance extraction (****What do you wonder whether Maggie smiled?)*** or middle formation ***(*That silly smile smiles easily).*** Cognate objects therefore group with distance NPs as far as referentiality is concerned.[27] However, Massam shows that cognate objects, unlike distance NPs, cannot occur with existing internal arguments (****Mordred killed the knight a terrible death;*** Massam 1990:175). This groups them with referential TOTAL-PATH NPs as far as case assignment is concerned. The difference between cognate objects and distance NPs requires a separation between referentiality and case assignment.

Another type of postverbal ***NP*** can shed light on this interaction. Smith (1992) discussed Romance "measure-complements" such as ***trente-six francs*** in (50).

[27] Massam (1990) also argues that the referentiality distinction between cognate objects and "transitivizing objects" is a graded distinction, but she uses this fact to argue that cognate objects are referential like transitivizing objects. By the term "referential", Massam also means referential as opposed to predicative.

(50) Ces allumettes coûtent trente-six francs.
'These matches cost thirty six francs.' (Smith 1992:296)

Smith showed that these measure complements do not undergo passivization, and are not extractable from a wh-island. They can cooccur with existing internal arguments:

(51) Il a payé sa maison trente-six millions.
'He paid his house thirty-six million [centimes/old francs].' (Smith 1992:304)

From these data, it would appear that these Romance measure-phrases pattern with distance NPs. These are the two types of NPs discussed here which do not need to occur adjacent to the verb and which can occur together with an existing internal argument. This fact suggests that a NP indicating a measure of some sort has the ability to receive inherent case. Further research would be required to find out if this is true.

The combination of the three distinctions of thematic versus aspectual licensing, referentiality, and case assignment can make sense out of the different behaviours of **TRANSLATED-OBJECTS**, referential **TOTAL-PATH NPs**, distance **NPs**, cognate objects, and Romance measure phrases. All three degrees of freedom are necessary to account for these data. If the aspectual and thematic dimensions were collapsed into a single thematic representation, such **as** thematic roles, certain problems would arise. For one thing, it would be necessary to assign a thematic role to some constituent inside another constituent with a different thematic role. For example, in ***Liza curried*** the ***package to the university, the university*** is the **SPATIAL-GOAL** and ***to*** the ***university1*** **is** the **TOTAL-PATH.** This could cause some difficulties for conventional theories of thematic roles. Secondly, **TOTAL-PATH NPs** and distance NPs would have to be assigned the same thematic role, resulting in the assignment of a thematic role to the adjunct-like distance NPs. The literature on thematic roles is inconsistent on the question of whether or not this should be possible (but see Dowty ***1991*** for an insightful discussion of the problems that follow from allowing thematic roles to be assigned to adjuncts).

A thematic hierarchy approach would fare no better.[28] It has been proposed that there exists a universal hierarchy of thematic roles, which arranges thematic role types in a fixed order. Various syntactic processes have been argued to refer to this thematic hierarchy and the hierarchy has proved more flexible for linking rules to operate over. **Two** immediate problems arise if we attempt to use thematic hierarchies for these data. First of all, although authors who use thematic hierarchies generally agree that there is a universal hierarchy of thematic roles which processes in natural language refer to, there is less consensus on what that hierarchy is. In particular, there is disagreement about the relative position

[28] **Only** a small part of the literature employing thematic hierarchies can be cited here, but see Jackendoff (1972), Foley and Van Valin (1984), Bresnan and Kanerva (1989), Givón (1984) and Grimshaw (1990).

of themes and goals in the hierarchy. Two versions of the hierarchy which have appeared in the literature are shown below:

(52) (Agent (Experiencer (Goal/Source/Location (Theme)))) (Grimshaw 1990:8)

(53) AGENT > THEME > GOAL > OBLIQUES (manner, location, time...) (Larson 1988:382)

Secondly, a path or TOTAL-PATH has not been generally included as a thematic role in these hierarchies. The thematic role of theme might be equated with a moved-object, or it might be equated with a path, since the term theme has been used in various ways. However, even if these problems were skirted by adopting some version of a thematic hierarchy and inserting the TOTAL-PATH into the hierarchy, a thematic hierarchy still could not represent the optional status of the COMPLETE PATH/GOAL complex, nor would it provide any account of the association of the optional COMPLETE PATH/GOAL complex specifically with the aspectual structure associated with translative motion. The hierarchy would have to be altered depending on whether certain aspectual structures were optional adjuncts or obligatory arguments for various verbs. A universal thematic hierarchy could not be maintained.

In any case, thematic role accounts are inherently problematic. A number of problems with the traditional notion of thematic roles have become apparent, and doubt has emerged as to whether these roles should be considered to be linguistic primitives. (See Rappaport and Levin **1988;** van Voorst **1988;** Burzio **1986;** Croft **1991;** Langacker **1988;** Zubizarreta **1987;** Jackendoff **1987;** and Dowty **1991.)**

A predicate decomposition approach to thematic information can introduce a limited kind of modularity, and this approach underlies the work in lexical semantics (mentioned in section **2)** which treats the COMPLETE PATH/GOAL complex as a separable unit in the lexical semantic representations. Approaches to thematic information involving predicate decomposition in some form may be found in Carter **(1988a),** Jackendoff **(1990),** Rappaport and Levin **(1988),** Croft **(1991),** Langacker **(1988),** Dowty **(1991)** and were found in the generative semantics literature as well (Lakoff **1971;** McCawley **1968).** These approaches may be set in the framework of Cognitive Grammar or may be cast in a framework of Conceptual Structures or Semantic Representations, but they have in common the fact that they involve decomposition of the predicate into a structured arrangement of elements. A system such as Jackendoff's, for example, can capture the optional translative motion reading that occurs with these verbs, but it cannot represent the more general statement, that the verbs of imparting motion and the verbs of consuming distance are a minimal pair, sharing the same aspectual licensing properties but differing in thematic licensing properties. Also, it is not clear how Jackendoff's system could distinguish between TOTAL-PATH NPs and distance NPs and consequently it is not clear how it could predict their different behaviours. Moreover, since Jackendoffs linking system operates only over arguments and

not adjuncts,[29] the linking of distance NPs could not be related to the linking of TOTAL-PATH NPs. TOTAL-PATH NPs and distance NPs must be identified similarly as participants in the COMPLETE PATH/GOAL complex for certain aspects of linking, but they must be distinguished from each other for other aspects of linking.

Some of the thematic role literature has recognized the referential/non-referential distinction in NP types. Dowty (1991554) makes reference to a possible thematic role of extent, which includes what have been referred to in this article as ***distance noun phrases.*** This extent role refers to a kind of measurement including not only distance (54), but also quantity (55).

(54) a. I walked a mile.
b. I swam thirty meters.

(55) a. I slept twelve hours.
b. This weighs five pounds.
c. The piano measures 6' 5".
d. It took me an hour to grade the papers.
e. The book cost me $5.

Dowty points out quite reasonably, that using the EXTENT role leads to problems in making a clear distinction between the EXTENT role (which is a measure of pure quantity) and another thematic role such as THEME which refers to a concrete object, but which also happens to express a quantity or measure (e.g., ***The book cost me $5/ Zpaid for the book with this $5 bill).*** This is the gradational distinction between NP PATHS and ***distance noun phrases*** discussed in section **5.2.** Dowty points out further that in using this thematic role we are also forced to assign thematic roles to both adjuncts and arguments, when the adjuncts play the same role in the lexical semantics as the arguments. If distance can get a thematic role, he argues, what about rate? and do we assign thematic roles only to noun phrases or to adverbs as well? The thematic role of EXTENT, which would seem to be appropriate for an analysis of sentences involving PATHS, introduces more problems than it would solve. The kind of proliferation of thematic roles that would result has been one of the problems with the thematic role approach that has driven many authors to other approaches to thematic information.

[29] Jackendoff resorts to a thematic hierarchy-based system of linking. The arguments in Conceptual Structure are ordered according to a thematic hierarchy, and then mapped to arguments in the syntactic structure, which are also ordered. Since only arguments are ordered in the thematic hierarchy, the problem remains of how to state the relevant linking generalizations over both arguments and adjuncts.

7. CONCLUSION

This article has examined the distribution and behaviour of **TRANSLATED-OBJECTS**, referential **TOTAL-PATH NPs**, and distance NPs with the verbs of consuming distance and the verbs of imparting motion. It has been argued that these verbs differ minimally in having the same aspectual licensing properties but different thematic licensing properties. A picture has emerged in which aspectual structure may itself be thematically licensed by a verb and this aspectual structure may have its own arguments, which are then indirectly licensed by the verb. The behaviour of **TRANSLATED-OBJECTS**, referential **TOTAL-PATH *NPS***, and distance ***NPS*** has been compared with that of two other ***NP*** types: cognate objects and Romance measure phrases. Three types of modularity are required to account for the behaviour of these elements: aspectual versus thematic licensing, structural versus inherent case assignment, and referentiality versus non-referentiality. Of these three, only referentiality is a graded rather than a binary distinction. The article has put forth a highly modular view in giving a simple account of the differences between these various ***NP*** types. A highly modular view of the argument-like properties and the nature of "argumenthood" must follow as a consequence.

APPENDIX: HOW THIS APPROACH TO ASPECT FITS INTO THE ASPECT LITERATURE

Aspect has a long history in the linguistic and philosophic literature, going back as far as Aristotle. The study of aspect encompasses the study of how natural language expresses and organizes events in time. In its broadest conception, the term aspect includes an extremely wide range of sometimes disparate phenomena, and the term has not always been used consistently by various authors in the literature. The body of general linguistic literature on aspect is huge, but insightful overviews can be found in Binnick (1991), Comrie (1976), Chung and Timberlake (1985), and Smith (1991). Various elements of the sentence may contribute aspectual information, including verbal morphology, adverbial modifiers, quantifiers, and the verb itself. The aspectual information contributed by the verb has been referred to as *Aktionsarten* in some of the literature. In this article I focus on one aspect of aspect and ***Akfionsarfen:*** the temporal boundedness of the event, **as** indicated by the verb in composition with its internal arguments.

The taxonomy of verbal aspect developed by Aristotle was introduced into the modern linguistic literature by way of the philosophical literature. Kenny (1963), Ryle (1949) and Vendler (1967) were most instrumental in introducing Aristotelian aspect into the thought of modern linguists. The property of an event's being temporally bounded, or having a definite temporal terminus, figured crucially in the typologies of verbal aspect introduced by all these authors, as well as subsequent typologies that appeared in the literature (Bach 1986; Dowty 1979; Grimshaw 1990; Mourelatos 1981; Parsons 1985; Pustejovsky 1991; and

Verkuyl **1972).** Implicit (or sometimes explicit) in these taxonomies of verbal aspect is the idea that there is a small finite set of semantic possibilities for the temporal structuring of events described by natural language predicates, since these classifications of predicates into aspectual types are meant to be exhaustive.

The verbs discussed in this article, in the usage with goal phrases involving translative motion, represent a subclass of Vendler's class of "accomplishment" predicates: predicates which describe events that have some duration in time, and also are temporally bounded or have a definite terminus in time. The verbs of consuming distance and the verbs of imparting motion, in their usage with goal phrases, are a subclass of accomplishment predicates that specifically involve translative motion which maps a spatial path into an interval of time. With the translative motion sentences discussed in this article, it is the spatial dimension of the **TOTAL-PATH** which is translated into temporal information about the duration of the event. The finiteness of the path makes the event described a temporally bounded one. The fact that certain classes of direct objects can determine the aspectual status of the verb phrase or sentence is well-known in the semantics literature (Dowty **1979;** Platzack **1979;** Hinrichs **1985;** Verkuyl **1972, 1993;** and Krifka **1992;** among others). The property of temporal boundedness is compositional, being determined by a combination of certain properties of the verb and the direct object (and in the case of goal phrases, other material in the verb phrase as well). Krifka **(1992),** Verkuyl (1993) and Jackendoff **(1993)** present systems in which the relation between the spatial extent of the **TOTAL-PATH** and the temporal extent of the event can be expressed formally and precisely. Krifka's and Verkuyl's systems will be introduced here. Only the briefest of overviews can be provided here; the reader should see the relevant works for further discussion.

Krifka **(1992)** employs homomorphisms from objects to events to capture the relationship between the spatial boundedness of the object and the temporal boundedness of the **event.**[30] Krifka's homomorphism is expressed in the formula below:

(56) (mapping to events)
$\forall R\,[\text{MAP-E}(R) \Leftrightarrow \forall e,x,x'[R(e,x) \wedge x' \subseteq x \rightarrow \exists e'[e' \subseteq e \wedge R(e',x')]]]$
(where $\subseteq$ represents a two-place relation *part*)

(Krifka 1992:39)

This formula expresses the idea that, for an event ***e*** and an object ***x*** of which the mapping-to-events relation holds, every part of the object "consumed" in the event corresponds to a part of the event. Krifka applies this formula to a different class of verbs than those addressed in this article, but the formula applies as well to the verbs under discussion here. If ***x*** represents the **TOTAL-PATH,** which has an extent measurable in distance (e.g., ***the Long Trail to the Canadian border),*** then portions of that distance "consumed" in the walking event correspond to

[30] **Jackendoff** (1993), in a very different system, also employs homomorphisms from objects to events.

portions of the event itself. Portions of the distance to the Canadian border map to portions of the entire walking event. In addition to mappings between objects and events, Krifka's approach provides a mapping from an event to its "run time", which introduces the final temporal element. Krifka's homomorphism expresses the aspectual structure this article focuses on.

Verkuyl (1993) is a culmination and summary of his work on aspect, which began with Verkuyl (1972). Verkuyl analyzes the composition of terminative or temporally bounded aspect, as resulting from the presence of the feature **[+ADD TO]** on the verb, and the feature [+SQA] (specified quantity of **A)** on the direct object.[31] The feature **[+ADD TO]** identifies the class of verbs which have the potential to describe temporally bounded events, which are verbs involving some kind of "movement". (This feature eliminates, for example, stative predicates.) The feature [+SQA] identifies the boundedness of the object which is mapped into the temporal boundedness of the event. Verkuyl (1993) presents an account of this composition in a model-theoretic semantic grammar grounded in set theory and employing tools of quantification. Verkuyl defines [+SQA] in his 1993 work with careful attention to the contribution of determiners, specifiers, mass nouns, and negation present in the **NP. [+ADD TO],** the relevant temporal property of the verb, is defined in terms of a "successor function" which captures the temporal structure of successive intervals of time, and which is necessary for the aspectual composition. The mapping of the boundedness of the object into the temporal boundedness of the event is achieved through a "path function" which maps the denotation of the object into a set of time and spatial coordinate pairs.

The work of Krifka and Verkuyl provides models that can define the aspectual structure discussed in this article. These two authors, however, do not necessarily focus on the verbs involving translative motion. Other types of direct objects contribute to the composition of terminative aspect, and other types of verbs besides those verbs involving translative motion may be found, which may participate in this kind of aspectual structure.[32] The verbs of consuming distance and the verbs of imparting motion are just two examples of verb classes that may participate in this type of structure.

The place of the aspectual structure discussed in this article within the general literature on aspect can be summarized as follows. Out of the wide range of

[31] Verkuyl also applies the feature [+SQA] to subjects of sentences. However in Verkuyl (1993) he argues for a compositional anaysis of aspect in which the object and the verb are composed together before the subject enters into the composition. It is therefore within the spirit of Verkuyl's work to focus on the interaction of verb and object.

[32] Tenny (1994) discusses a tripartite typology of internal arguments that contribute to the composition of terminative aspect. The typology includes the path-objects associated with translative motion which are described in this article, objects undergoing changes of state, and "incremental-theme objects." Tenny (1995) compares the path-objects of translative motion with these other two types of direct objects, with respect to the contributions of pragmatics to aspectual meaning.

phenomena that have been labeled aspectual, I am focusing specifically on terminative aspect. Within the range of phenomena covered by terminative aspect, I am focusing specifically on a semantics in which there is a mapping from some TOTAL-PATH to a temporal event, through the medium of the translative motion of a TRANSLATED-OBJECT along a TOTAL-PATH to a SPATIAL-GOAL. Aspectual structure as defined here refers to the presence of this particular semantics associated with the internal arguments of the verb.

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