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Telicity and English Verb Classes and Alternations: An Overview

by

Mari Broman Olsen
Institute for Advanced Computer Studies
A. V. Williams Building
College Park, MD 20742
mari@umiacs.umd.edu

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Abstract

This document reports on research conducted for the University of Maryland Machine Translation (MT) project. The primary focus of this investigation concerns the lexical aspect feature [+telic] (i.e., having an inherent end, as in the verb *win,* vs. the verb *run*) and its relation to the alternations outlined in (Levin, 1993), *English verb classes and alternations.* This work is based on the assumption that lexical aspect features need not be primitive but may be derived from the same semantic components that potentiate the alternations.

Levin's 86 alternations and constructions are divided into five classes with respect to telicity: (i) alternations that indicate telicity (all participating verbs are [+telic] in their basic sense), (ii) alternations and constructions that add telicity (all participating verbs are [+telic] in the relevant construction), (iii) alternations that indicate atelicity (all participating verbs are [∅telic] in their basic sense), (iv) alternations and constructions that are irrelevant with respect to (a)telicity (some participating verbs are [+telic] and others [∅telic], and their categorization is not systematically affected by the relevant construction), and, for completeness, (v) a small number of alternations that cannot be classified.

For alternations indicating telicity—category (i)—I examine the semantic components said to potentiate the alternations, and for alternations and constructions adding telicity—category (ii)—the semantic components added along with telicity. The results suggest a composite semantic basis for telicity, related to the notion of CHANGE OF STATE (broadly defined), but not perfectly correlated with it. Other notions are also relevant, such as CONTEXTUALLY TYPICAL DEGREE, RECIPROCAL ACTION, and DYNAMICITY, another lexical aspect feature. In addition, the study of categories (ii)–(iv) reveals that certain frames may be used for diagnosing atelicity, despite its generally variable behavior.

This study also explores the relationship between transitivity and telicity, following suggestions in the work of Hopper and Thompson (1980), Tenny (1987; 1989; 1994), and van Hout (to appear), among others.

Contents

1 Introduction

The nature of lexical aspect (also known as *Aktionsart*) has been the subject of much debate, in linguistic as well as in philosophical circles. Some have argued that the temporal properties represented by lexical aspect features fall outside the domain of semantics proper. Porter (1989), for example, adopts this position because the lexical aspect features—unlike the grammatical aspect features [+imperfective] and [+perfective]—are not morphologically realized. In contrast, Vendler (1957, p. 102) demonstrates that lexical aspect is semantically relevant by showing how his four categories (STATE, ACTIVITY, ACCOMPLISHMENT, and ACHIEVEMENT) behave differently in a variety of temporal test frames, such as *For how long did X V?;* and *How long did it take X to V?* Accomplishments and achievements, for example, are odd with the first frame (*#For how long did John build a house?*) but not the second (*How long did John build a house?*).

Olsen (1994b; 1994a) sides with Vendler, showing furthermore that these lexical aspect classes are not themselves semantic primitives but composed of three privative lexical aspect features: [+durative], [+dynamic], and [+telic].[1] Verbs marked [+durative] denote situations that persist over a temporal interval; those unmarked for durativity ([∅durative]) are usually interpreted as punctiliar, although they may be interpreted as durative, given the appropriate constituents or pragmatic context. Verbs marked [+dynamic] are events; those unmarked for dynamicity ([∅dynamic]) are usually interpreted as states. The [+telic] verbs are interpreted as having an inherent end and [∅telic] verbs as usually lacking such an end. It is therefore lexical aspect features that condition different semantic behavior in the syntactic test frames. Where the features are unmarked for a given class, verbs in the class show variable membership as well. For example, "state" verbs, since they lack the feature [+dynamic], can be either interpreted as states (*John* **is** *an American*) or as events (*John* **is being** *an American when he refuses to learn another language),* depending on other constituents and the pragmatic context.

Vendler distinguishes the temporal properties of verbs (represented here by lexical aspect features) from their non-temporal semantics. It remains to be seen, however, whether lexical aspect is indeed orthogonal to other lexical semantic properties. Since differences in lexical aspect condition different

[1] The features and a cooccurrence restriction permit description of two other categories: semelfactives and stage-level states (Olsen, 1994a, p. 66).

behavior in temporal frames, lexical aspect features appear to be similar to other semantic properties, as catalogued by Levin (1993). According to Levin (1993, p. 1), "the behavior of a verb, particularly with respect to the expression and interpretation of its arguments, is to a large extent determined by its meaning."

This paper approaches lexical aspect from the semantic side, as a first attempt to relate lexical aspect—beginning with telicity—to other "linguistically ... pertinent aspects of verb meaning" (Levin, 1993, p. 1). As in (Dorr et al., 1995, p. 29), aspect is taken to be a property of interlingual (IL) structures of type SITUATION. According to Dorr et al. (1995), the information from which situation (lexical) aspect is derived has three possible IL sources: it may i) be directly (lexically or morphologically) encoded in the lexicon, ii) be indirectly encoded in the lexicon as part of an IL primitive, or iii) need to be derived. Dorr and Palmer (1995) explore the second possibility, modifying the IL representations, so that, for example, only telic verbs have GOAL primitives. This paper explores the third alternative, that the lexical aspect features are not primitive and independent, but related to—and perhaps derived from—other semantic elements, some of which are currently represented in the IL (such as change of state and dynamicity) others of which are not (such as contextually typical degree and reciprocity). It is not my intention to justify the inclusion of a particular element in the IL structure, but rather to make a preliminary investigation into the relation between telicity and the wide range of syntactic-semantic alternations catalogued in (Levin, 1993).

I examine the semantics surrounding the 85 alternations in (Levin, 1993)—the semantic elements that potentiate the alternations, as well as the semantics of the alternations themselves. The alternations fall into five classes with respect to telicity: (i) alternations that indicate telicity (all participating verbs are [+telic] in their basic sense), (ii) alternations and constructions that add telicity (all participating verbs are [+telic] in the relevant construction), (iii) alternations that indicate atelicity (all participating verbs are [$\emptyset$telic] in their basic sense), (iv) alternations and constructions that are irrelevant with respect to (a)telicity (some participating verbs are [+telic] and others [$\emptyset$telic], and their categorization is not systematically affected by the relevant construction, and, for completeness, (v) a small number of alternations that cannot be classified.

Semantic bases are proposed for each category, with particular attention paid to alternations indicating and adding telicity. For alternations indicating telicity—category (i)—I examine the semantic components said to potentiate the alternations, and for those adding telicity—category (ii)—the semantic components added by the construction along with telicity. The results suggest that telicity is imperfectly correlated with the semantic notion of change of state, broadly defined. Other notions that play a role are also discussed, such as CONTEXTUALLY TYPICAL DEGREE (introduced in this study), RECIPROCAL ACTION, AND DYNAMICITY. Further research is needed to refine the semantic characterization of telicity and categorize the alternations interacting with it. This work complements research that approaches such issues from the syntactic side. Tenny (1989; 1995), for example, relates both telicity and dynamicity[2] to the assignment of NPs to external, direct internal and indirect internal argument positions. van Hout (to appear, p. 2) argues that the projection of argument positions is based on event structure, specifically that telic verbs require an object. Similarly, Macfarland's (1995) work on cognate objects may be naturally extended to suggest that telicity distinguishes argument NPs from adjuncts.

In the next section I outline my methodology and present the theoretical assumptions underpinning this research. In sections 3—7 I present, respectively, alternations indicating telicity, adding telicity, irrelevant with respect to telicity, indicating atelicity and unclassifiable. I list the alternations placed in each category and present a semantic analysis of their relation to telicity. Section 8 concludes.

2 Methodology and Assumptions

This work is grounded in the model of lexical aspect presented in (Olsen, 1994b; Olsen, 1994a), outlined briefly here. Olsen (1994b; 1994a) presents the lexical aspect classes (state, activity, etc.) as clusters of the privative features [+dynamic], [+durative], and [+telic], in contrast to models that treat the classes either as indivisible primitives or as made up of equipollent features ([±dynamic] (dynamic/stative), [±durative] (durative/punctiliar), and [±telic] (telic/atelic)). In the privative model, verbs are minimally either [+dynamic] or [+durative]. Other features may be marked or left unmarked, as summarized in (1) (Olsen, 1994a, pp. 32–33).

[2] Tenny prefers the terms "delimitedness" (1995, p. 125, n.2) and "necessary internal change or motion (1995, p. 14)."

(1)

Aspectual Class	Dynamic	Durative	Telic	Examples
State			+	*know, have*
Activity		+	+	*run, paint*
Accomplishment	+	+	+	*destroy*
Achievement	+	+		*notice, win*
Semelfactives			+	*cough, tap*
Stage-level states	+		+	*be sick*

The marked lexical aspect features are always present in the semantic representation, but features that are unmarked on the verb may become marked by other constituents[3] (Olsen, 1994a, p. 38). The model therefore accounts for, e.g., activity verbs—marked [+dynamic, +durative]—and accomplishment verbs—marked [+dynamic, +durative, +telic].

(2) (i) Taylor ran. ACTIVITY

(ii) Taylor ran a mile. ACCOMPLISHMENT

The privative model therefore allows one to describe not only which verbs have a given feature, but it also assumes that certain elements—such as the direct object in (2)(ii)—mark lexical aspect features.

The verbs participating in the alternations and constructions in (Levin, 1993) and the resulting predicates were analyzed with respect to telicity. Levin illustrates each with representative categories, with indications of acceptability based on intuition (Levin, p.c.). I supplemented them with my own intuition, adding or eliminating classes or verbs, as noted below. Wherever appropriate (and except as noted) I refer to the form referred to in the name of the alternation as the "alternation" form, and the other variant as more basic. For example, Levin describes the Cognate Object Construction (7.1), by showing two variants with the relevant set of verbs: one with a cognate object (*She smiled a wonderful smile*) and one without (*She smiled*). When I refer to the Cognate Object Construction as adding telicity (section 4), I mean the variant with the cognate object, rather than the intransitive.

In categorizing the alternations, it was first determined whether the verbs undergoing the alternation were a homogeneous class with respect

[3] They may also be interpreted as marked in the appropriate pragmatic context (Olsen, 1994a, p. 57).

to telicity.[4] If the verbs undergoing the alternation were all [+telic],[5] the alternation was classified as **indicating** [+telic],[6] as in the intransitive Total Transformation Alternation in (3), with verbs undergoing the alternation exhaustively listed, with respect to (Levin, 1993).[7]

(3) **2.4.4 Total transformation Alternation (intransitive)**
Example: He turned into a frog./He turned from a prince into a frog.
Verbs: TURN VERBS (some): alter, change, metamorphose, ?transform, ?transmute, turn

Alternations which applied either to a uniformly atelic set of verbs or to a mixed ([+telic] and atelic) class fall into two additional categories. For some alternations, the input could be either atelic or mixed, but the resulting predicate in the alternation is always telic. These alternations, such as the Cognate Object Construction, are classified as **adding** [+telic].[8] The most common verbs participating in this construction are listed in (4) (Macfarland, 1995), (Levin, 1993, pp. 95–96).

(4) **7.1 Cognate Object Construction**
Example: I fought/I fought the good fight.
Verbs: die, live, sing, smile, tell...

For other alternations, both the bare verbs and the verbs in the relevant alternation are uniformly atelic. These alternations were classified as indi-

[4] Other lexical aspect features are briefly considered in section 6.

[5] By standard tests, particularly the entailment test shown in (i)–(ii) (see (Olsen, 1994a, p. 42) for discussion).

(i) John was running ENTAILS John has run. ATELIC

(ii) John was winning DOES NOT ENTAIL John has won. TELIC

The test is simplified here, since the privative analysis permits atelic verbs to have telic interpretations and the corresponding entailments. More accurately, I consider verbs with uniform lack of entailments as telic and those with variable behavior as atelic.

[6] Constructions that indicate telicity of verbs to which they apply are also themselves [+telic], since marked features may not be removed under the monotonic composition of privative features introduced in (Olsen, 1994b; Olsen, 1994a). In other words, if the verbs themselves are all [+telic], so are both variants of an alternation.

[7] Section numbers and examples are taken from (Levin, 1993) throughout.

[8] Alternatively, one could focus on the alternations (rather than the verbs in them) and say they indicated telicity of predicates in the relevant variants (see section 4 for further discussion). This category raises the problem of how to formulate a compositional semantics that allows [+telic] alternations and verbs to unify as [+telic] but rules out multiple resultatives (**John ran the gas tank dry broken*).

cating [∅telic], as illustrated by the With/Against Alternation[9] in (5), with the verbs from (Levin, 1993) exhaustively listed.

(5) **2.8 With/Against Alternation**
Example: I hit the rod against the fence/I hit the fence with the rod.
Verbs: HIT VERBS: bang, bash, batter, beat, bump, butt, dash, drum, hammer, hit, kick, knock, lash, pound, rap, slap, smack, smash, strike, tamp, tap, thump, thwack, whack

If neither the verbs nor the alternation variants are homogeneous classes then the alternation is classified as irrelevant with respect to telicity, although other lexical aspect features may be operative (section 6). This category is illustrated by the *With* Preposition Drop Alternation.

(6) **1.4.2 With Preposition Drop**

(i) Jill met (with) Sarah.

(ii) Jill battled (with) Sarah.

Verbs: MEET VERBS: battle, box, consult, debate, fight, meet, play, visit

A final category consists of two unclassifiable alternations (3.2 Natural Force and 3.3 Instrument Subject), for which Levin (1993) gives only one verb.

I examine the semantic components that potentiate the eight alternations **indicating** [+telic] (section 3), assuming that the necessary and sufficient semantic conditions may underlie telicity as well. Six of these apply to classes of verbs organized around the property of change of state. The semantic features added by 22 of the 27 alternations that **add** [+telic] (section 4) echo the change of state property. Other salient features added along with telicity include contextual typical degree, reciprocal action, and dynamicity.

The two other (classifiable) categories also contribute to an understanding of [+telic] semantics: the constructions that appear to indicate atelicity (section 5) show that it is possible to diagnose [∅telic] in restricted contexts, even if unmarked features are generally cancellable. As further support for the privative analysis of telicity, the alternations that indicate atelicity—as well as those irrelevant to (a)telicity (section 6)—fail to show the relatively

[9] See (Tenny, 1994) for a discussion of this alternation.

uniform semantic subclasses of the alternations indicating and adding telicity. Furthermore, some of them show semantic properties associated with [+telic] predicates, such as change of state, indicating that further refinement of the relationship between telicity and its semantic underpinnings is necessary. The categories and the alternations in them are discussed in detail in sections 3–7, as summarized in (7).

(7)

Telicity Property	**# of Alternations**	**Section #**
Indicates [+telic]:	8	3
Adds [+telic]:	27	4
Indicates [∅telic]:	13	5
Irrelevant to (a)telicity:	35	6
Unclassifiable alternations:	2	7
TOTAL:	85	

3 Alternations Indicating [+telic]

No alternation in (Levin, 1993) applies to every [+telic] verb, however some alternations appear to apply only to a subset of verbs that are [+telic] in their basic sense.[10] Since telicity is a marked privative feature, the verbs are [+telic] in both variants of the alternations in this section. For five of the seven alternations in this category Levin lists only one verb class to which the alternations apply. One may therefore predict that verbs found in these alternations would not only be [+telic] but also members of the relevant class.[11]

Six of the alternations in this section apply to verbs that entail a change of state,[12] as listed in (8). Examples and verbs here and below are from (Levin, 1993), from the section number given. The variant referred to by the title is illustrated by the second of the two sentences.

(8) (i) **1.2.3 Understood Reflexive Object Alternation**
Example: Jill dressed herself./Jill dressed.

[10] Hence, these verbs are [+telic] in every use, under the characterization of [+telic] in (Olsen, 1994a). For an alternative characterization, under which a basic [+telic] verb may become atelic, see (Smith, 1991).

[11] It is also possible—here and elsewhere—that the apparent [+telic] uniformity of verbs in these alternations is an artifact of the small sample of verbs.

[12] For some discussion as to why "change of state" is perhaps not an ideal term, see (Olsen, 1994a, pp. 40–41) and below. I will continue to use the term, for lack of a good alternative.

Verbs: DRESS VERBS: bathe, change, disrobe, dress, exercise, preen, primp, shave, shower, strip, undress, wash; LOAD VERBS (some): jam, cram, load, pack; PUSH/PULL VERBS (some): jerk, pull, yank

(ii) **2.3.5 Clear Alternation (intransitive)**
Example: Clouds cleared from the sky./The sky cleared (of clouds).
Verbs: CLEAR VERBS (except *clean):* clear, drain, empty

(iii) **2.4.3 Total Transformation Alternation (transitive)**
Example: The witch turned him into a frog./The witch turned him from a prince into a frog.
Verbs: TURN VERBS: alter, change, convert, metamorphose, transform, transmute, turn

(iv) **2.4.4 Total Transformation Alternation (intransitive)**
Example: He turned into a frog./The witch turned him from a prince into a frog.
Verbs: TURN VERBS (some): alter, change, metamorphose, ?transform, ?transmute, turn

(v) **2.6 Fulfilling Alternation**
Example: The judge presented a prize to the winner./The judge presented the winner with a prize.
Verbs: VERBS OF FULFILLING: credit, entrust, furnish, issue, leave, present, provide, serve, supply, trust

(vi) **3.4 Abstract Cause Subject Alternation**
Example: He established his innocence with the letter./The letter established his innocence.
Verbs: assert, confirm, demonstrate, establish, explain, imply, indicate, justify, nullify, obscure, proclaim, predict, prove, reveal, show, suggest

These alternations all describe processes of transformation or change of either the direct object (in the transitive forms) or the surface subject (in the intransitive forms).[13] The Understood Reflexive Object Alternation (8)(i) predicates change in, for example, a body, to the state of *clean, dressed,* etc.[14] The *Clear* Alternation (8)(ii) applies to a subset of "change of state"

[13]The relationship between transitive verbs and unaccusatives (verbs whose surface subjects are underlying direct objects) will be discussed further in section 4.

[14]The PUSH/PULL VERBS predicate change of position, a type of change of state; see section 4 below.

verbs (Levin, 1993, p. 124). The Total Transformation Alternations (8)(iii–iv) describe complete transformations, for which the final state is obligatorily expressed (Levin, 1993, p. 178). Verbs in the Fulfilling Alternation describe events of transfer—either concrete, as in the example in (8)(iv), or abstract, as in (9):

(9) The supervisor credited the sale to the salesman who closed the deal.

As changes of state, the alternations in (8)(i–v) may be represented as GO_{Ident} situations, that is, changes of properties, in Lexical Conceptual Structure (Dorr, 1993), an augmented form of (Jackendoff, 1983). The Abstract Cause Subject Alternation may also be so represented. However, further examination is required of the verbs participating in this alternation, a subset of a dozen verb classes. Levin (1993, p. 81) suggests that Abstract Cause "could be collapsed" with the Instrument Subject Alternation. The fact that the latter alternation does not apply to a homogeneously [+telic] set of verbs may argue against such a merge.

The homogeneity of the verbs in the alternations in (8), with respect to the change of state property, contrasts with verbs in other categories for which telicity is irrelevant (see section 6). For example, the 2.12 Body-Part Possessor Ascension Alternation applies to both [+telic] and [∅telic] verbs, entailing an effect on the direct object only for the former. (On the [∅telic] verbs—the TOUCH VERBS and VERBS OF CONTACT BY IMPACT—see (Levin, 1993, pp. 156,148–153).)

The 5.3 Adjectival Passive may also fit with the alternations indicating [+telic], although telicity is generally not evaluated with respect to NP constructions alone. However, to the extent that telicity may be shown to correlate with transitivity (having a true direct internal argument (Levin and Rappaport Hovav, 1986), see (Macfarland, 1995) and section 4 below), verbs that allow an adjectival passive are [+telic], and the construction indicates telicity.

One additional alternation appears to indicate [+telic], although only some of the verbs allowing it describe changes of state.[15] Like its transitive counterpart discussed in the next section, this alternation predicates reciprocal action of its NPs, or the NP and the PP object. Verbs participating in this alternation are listed not by class but by the preposition selected, as indicated in (10).

[15]It is also possible that the Simple Reciprocal Alternation is included in this category because of a bias in the short verb list given by Levin. However, note that the transitive version of this alternation is also associated with telicity, as adding [+telic] (section 4).

(10) **2.5.4 Simple Reciprocal Alternation** (intransitive)
Example: Brenda agreed with Molly./Brenda and Molly agreed.
Verbs:
Preposition = *with:* affiliate, agree, alternate, ... gab, ... joke, ...;
Preposition = *into:* blend, cream, mix;
Preposition = *to:* connect, join, link;
Preposition = *from:* decouple, differ, differentiate, ...

Most of the verbs are drawn from seven classes (Levin, 1993, p. 63). According to Levin, three classes—MIX VERBS (*blend, cream, mix, ...*), AMALGAMATE VERBS (*affiliate, alternate, ...*), and SEPARATE VERBS (*decouple, differentiate, ...*)—describe the results of changes of state ("the endstate of the direct object"), without specifying the manner, that is, how the change comes about: (Levin, 1993, pp. 160,161,165).[16]

An additional class—DIFFER VERBS—describes differences which may pre-exist or result from changes of state.[17] The final three classes—CORRESPOND

[16]The distinction between verbs lexicalizing results of changes of state (AMALGAMATE VERBS) and verbs lexicalizing manner as well as result (MIX VERBS) may turn out to be important, since Levin and Rappaport Hovav (1995a) and Levin and Rappaport-Hovav (1991) distinguish between simple result and simple manner verbs. The result verbs are expected to pattern with other result verbs, whereas manner-result verbs are predicted to have mixed properties. The MIX VERBS appear to specify manner more than the AMALGAMATE and SEPARATE VERBS, at least in a cooking context. The manner has minimally to do with the speed of the mixing, as evidenced by the settings on kitchen mixers (on my mixer, in order of increasing speed: fold, blend-mix, stir, whip, beat). As further evidence for a distinction between MIX VERBS and the latter two classes, note that, as Levin notes, MIX VERBS participate in alternations like *Together* (Levin, 1993, p. 161), which name end states, whereas the other two classes do not participate in neither *Together* nor *Apart* Alternations, as (i)–(ii) below show. I attribute this pattern to the fact that AMALGAMATE and SEPARATE VERBS name only the end state, to which *together* and *apart* add no new information; whereas the mix verbs (contra (Levin, 1993, p. 160)) specify manner as well.

(i) "Mix together and keep cool." (*Spis og drikk: Norwegian recipes old and new.* Minneapolis: Haymarket Press (n.d.), p. 47)
"Mix all the fruit together and fold in the whipped cream." (*Spis ...,* p. 170)
"Mix ingredients together" (*Spis ...,* p. 182)
"Cream together first 4 ingredients until fluffy" (*Spis ...,* p. 189)

(ii) *John amalgamated the white and the yolk together.
John separated the egg and the yolk apart.

[17]For this reason I think it is perhaps not appropriate to represent these verbs as $\mathrm{GO_{Loc}}$ and $\mathrm{GO_{Ident}}$; one alternative, namely $\mathrm{BE_{Ident}}$, seems to imply that the verbs are states rather than telic events.

VERBS,[18] MEET VERBS, and CHITCHAT VERBS—describe social interactions, involving multiple participants (Levin, 1993, pp. 200, 209). These three, found mainly in the *with* preposition subclass, do not appear to involve change of state notions, but rather to pass the telicity test based on the fact that more than one participant is required to complete a task, writing as least on letter, in the case of *correspond*. Thus *Brenda and Molly were corresponding (gabbing, gossiping, ...)* does not entail that *Brenda and Molly had corresponded (gabbed, gossiped, ...).* Specifically, the progressive may later be used to refer to Brenda's writing the first of a series of letters (or taking the first of a series of conversational turns) later to be known as *correspondence (gab gossip).*

Unlike other telic predicates, such as *build a house, eat an apple,* or *win a race,* events denoted by CORRESPOND, MEET (WITH), and CHITCHAT VERBS may continue even after one can be said to have corresponded, etc. That is, after one exchange of letters (minimal requirement for a correspondence) corresponding may continue and not necessarily as an iteration of the original minimal event (i.e., there may be only one more letter). In other words, these verbs do not entail a natural end (the definition of telicity in (Olsen, 1994a), inter alia). In this way, CORRESPOND, MEET (WITH), and CHITCHAT VERBS resemble degree achievements (Abusch, 1985), such as *cool* and *thin,* which also pass the telicity tests, but allow continuance of the event. The degree achievements, however, do eventually reach a natural limit (when the relevant object reaches the state named by the verb).

Although these verbs are syntactically intransitive, they conceptually require more than one participant:[19] note the ungrammaticality of the intransitive with a singular subject in parentheses in (11)(i)–(iii). In requiring multiple participants, these verbs rate higher on the continuum of transitivity proposed by Hopper and Thompson (1980, p. 252) and resemble those in the next section that are telic only in their transitive uses.[20] Clearly, more study is in order, to clarify the relationship between telicity and transitivity, and its syntactic and conceptual realizations.[21]

[18] *Correspond* also has a stative meaning; as such it is categorized as verb of existence (47.1). This meaning is not discussed here. The question of allowable polysemy (which verb meaning or lexical aspect configurations are allowed to have the same name) is also not discussed.

[19] As such, they would rate higher on the continuum of transitivity proposed by Hopper and Thompson (1980, p. 252, ex. 1A).

[20] Also see (Kemmer, 1993) on the relationship between conceptual and syntactic reciprocal constructions.

[21] Tenny (1989; 1994) provides one possibility, associating the direct object (direct in-

(11) (i) Brenda corresponded with Molly./Brenda and Molly corresponded. (*Brenda corresponded.)

(ii) Brenda met with Molly./Brenda and Molly met. (*Brenda met.)

(iii) Brenda chitchatted with Molly./Brenda and Molly chitchatted. (*Brenda chitchatted.)

Alternations indicating [+telic] therefore appear to cluster mainly around the change of state property. It is therefore possible that this notion underlies telicity as well. In fact some have suggested ((Pustejovsky, 1991, p. 56), cf. (Dowty, 1979, p. 141)) that change of state is the salient property distinguishing accomplishments and achievements from states and activities. However, change of state is not coextensive with telicity, since it fails to characterize all of the verbs participating in the intransitive Simple Reciprocal Alternation, although they nevertheless pass the telic non-entailment test. Subsequent sections support a strong association of telicity with change of state, although they identify exceptions: alternations related to telicity but not to change of state (section 4), as well as alternations related to change of state, but not to telicity (sections 5–6).[22]

4 Alternations Adding [+telic]

Many researchers observe that telicity is related to transitivity, among them Hopper and Thompson (1980); van Hout (to appear); Tenny (1987; 1994); Verkuyl (1993) (also see Macfarland (1995)). Van Hout, for example, claims that all telic verbs are transitive. Since telicity is a privative feature, which may become marked on atelic verbs, one might expect to find classes of intransitive atelic verbs that get marked [+telic] by a transitivizing alternation (Levin, 1993, pp. 25–44). The relationship between transitivity and telicity is not straightforward, however; I raise two illustrative issues here. First, I discuss the fact that many transitivity alternations are not related to telicity: that is, the verbs are uniformly [+telic] in the transitive variants

ternal argument, including the single argument of unaccusatives) with either the measure or the path, given certain restrictions. Although Tenny's analysis could be extended to predict certain of the correlations of telicity, transitivity and change of state in Levin's alternations and constructions, it is not clear how it applies to, for example, the reciprocal, in which both variants are telic, but only one has a direct internal argument.

[22] See (Olsen, 1994a, p. 40f) for other arguments against change of state as a lexical aspect feature.

of many alternations, nor atelic in the intransitive variants. Second, I show that the notion of transitivity is not uncontroversial, even if restricted to syntactic terms.

Note the directionality of van Hout's claim: although all telic verbs are supposed to be transitive,[23] not all transitive verbs are telic. Similarly, Tenny invokes special restrictions to account for transitive verbs, as in (12)(i), where the object *cart* does not add [+telic] to the activity *push.* With such verbs, telicity may come from other sources, such as the PP in (12)(ii).

(12) (i) The vendor pushed *his cart.*

(ii) The vendor pushed his cart *to a new location.*

If transitive verbs are sometimes atelic, they need not indicate telicity, nor must transitivizing alternations add telicity. In support of some sort of relation between telicity and transitivity (and/or atelicity and intransitivity), four transitivizing alternations, appear to add telicity to the affected verbs:[24] 1.1.1 Middle, 1.1.2.2 Induced Action, 1.2.7 *Way* Object, and 1.4.1 Locative Preposition Drop Alternations (see below). Two additional alternations appear to associate intransitivity with [∅telic], since they require [∅telic] verbs (section 5). Furthermore, none of the alternations indicating telicity (see previous section) is transitivizing; that is, none of the alternations that make verbs transitive applies to a class of verbs that are both intransitive and [+telic]. However, for 11 of the 17 transitivity alternations in (Levin, 1993), telicity is simply irrelevant (section 6). Furthermore, the

[23] Some telic verbs are, in fact, intransitive, e.g., *arrive, leave.* This is problematic for (van Hout, to appear), since she associates telicity with an event structure requiring two arguments. The difficulty may resolved, if, as discussed below, transitivity is associated with having an internal argument at deep structure, a property shared by both transitive and unaccusative verbs such as *arrive* and *leave.*

[24] Levin (p.c.) observes that this characterization depends on construing the intransitive verb as basic and the transitive as derived. This is not always the case. Levin and Rappaport Hovav (1995b, p. 84f) and Song (1995) show that canonical causative verbs, such as *break, open,* and *clear,* are, in fact, basically transitive (dyadic), since all intransitive uses of these verbs have transitive counterparts, but the converse is not true. Under the theory of lexical aspect assumed here, verbs that vary with respect to a feature such as telicity are analyzed as lacking that feature in their basic sense. One must therefore look elsewhere, e.g., in the transitivity alternation, for the source of the [+telic] reading. These two assumptions (that causative verbs are basically transitive, and that certain transitivity alternations add telicity) do not conflict in this study, since the 1.1.2.1 Causative/Inchoative Alternation is classified as irrelevant to telicity.

classification of the transitivity alternations with respect to telicity completely cross-cuts three subdivisions in (Levin, 1993, p. 13ff.): (i) object of the transitive verb = intransitive subject, (ii) subject of transitive = intransitive subject, and (iii) other. The 1.2.1 Unspecified Object Alternation, also undermines such the telicity-transitivity relationship. Although *eat, bake,* etc., can appear as [∅telic] activities with generic and plural direct objects, without a direct object they are uniformly [+telic]. That is, *John was eating/baking cakes* entails *John had eaten/baked cakes,* whereas *John was eating/baking* does not entail *John had eaten/baked.*

The notions of transitive and intransitive must be given a theoretically sound definition in order to clarify the relation of transitivity to telicity. The unaccusative verbs, in particular, must be examined. If the relationship between telicity and transitivity is linked to having two arguments (subject and object, as in (van Hout, to appear), the unaccusative verbs should not be included in a class with the dyadic transitive verbs. Hopper and Thompson show that, cross-linguistically, transitivity itself is a complex constellation of properties, which intersects with, but is not limited to, verbs with two arguments. If, therefore, the key criteria is having an object at an underlying level, the unaccusative verbs belong with the transitive two-argument verbs in the [+telic] class, as in (Tenny, 1994). This model would predict monadic accomplishments or achievements to be unaccusative. One would therefore expect transitivity alternations to add telicity only when they add an object to unergative intransitive verbs with one (subject) argument, rather than when a subject is added to an underlying unaccusative, such as *roll,* in *The ball rolled/John rolled the ball.* Work on unaccusative verbs does not directly support either classification of the unaccusatives: although all intransitive [+telic] verbs are unaccusative, atelic verbs may be either unergative or unaccusative (Levin and Rappaport Hovav, 1995b).

I now turn to the alternations themselves. In this category at least one member of the alternation pair is uniformly [+telic], irrespective of the category of the base verbs. That is, whether the base verbs are [+telic] or [∅telic], in the relevant construction(s) the predicate is [+telic].[25] Under

[25] A unification model of aspectual composition, such as that suggested in (Olsen, 1994a), may be problematic for these constructions, since [+telic] verbs combine with [+telic] alternations to yield [+telic] predicate, without being ungrammatical for having two bounds, as with **John built a house a garage* (see (Tenny, 1987) for discussion). The issue is similar to that involving sentence sets such as: *John ran a mile/John ran in an hour/John ran a mile in an hour.* The discussion in the next paragraph suggests a solution: maybe it is more accurate to say that these alternations indicate the telicity of predicates that may

a privative analysis, therefore, the [+telic] construction may be analyzed as adding [+telic] to the base verb (rather than to the [∅telic] member of the alternation, which may actually be syntactically more complex than the [+telic] member, as in 2.14 *As* alternation).[26] Furthermore, some of the alternations apply to uniformly atelic predicates and may therefore be used as diagnostics for [∅telic] verbs.

These alternations are of interest semantically in two ways. First, the semantic features that are added when [+telic] is added may shed light on the semantics of telicity. Second, the necessary and sufficient semantic conditions for the alternations may also reveal what potentiates the addition of telicity, that is, the restrictions on what may be viewed as an inherently bounded situation. The division between what is added by the construction and what is required is not always clear, and it is therefore not made in this report. For example, it seems not entirely accurate to analyze some constructions as telicizing, but because [+telic] constituents are required by these constructions, predicates in them are uniformly [+telic]. For example, the 1.1.1 Middle Alternation applies to [+telic] predicates such as *pound flat* (*This metal won't pound flat*), but not to atelic *pound* (**This metal won't pound*). Thus, all predicates in the Middle Alternation[27] are [+telic], although other elements (such as the resultative *flat)* contribute the feature. It may, therefore, be more appropriate to speak of such alternations as indicating telicity of the resulting construction.

The semantic features added or required by 22 of the 27 alternations in this section instantiate the change of state property identified as underlying telicity in the previous section. Eight alternations indicate change of state or position, two an "affected object", four a "holistic effect", four "resultatives", and four coming into existence or appearance. All of these may be characterized as changes of state; I discuss each in turn.

The alternations listed in (13) predicate a change of state or position of their object or unaccusative subject, as illustrated by the transitive *Apart*

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occur with them—both [+telic] verbs, and [∅telic] verbs made [+telic] by other means—rather than that the alternations themselves add [+telic]. Either way, the question of why only some verbs appear in these constructions appears to be independent of telicity: not all [+telic] verbs occur in them, nor may all [∅telic] verbs be used as [+telic] in these constructions.

[26] In fact this analysis may suggest other pairings of constructions, based on the composition of lexical aspect features.

[27] The form adding [+telic] is the named alternation unless otherwise indicated, e.g., the Middle (rather than the simple intransitive with which it is paired in (Levin, 1993)) is uniformly [+telic].

Reciprocal in (13). Change of position is included with the change of state alternations, following Pustejovsky (1991), among others.

(13) **Change of State/Position:**
1.1.2.2 Induced Action Alternation
2.1 Dative Alternation (both variants)[28]
2.9 *Through/With* Alternation (*Through* variant)[29]
2.14 *As* Alternation (Double object variant)
2.5.3 *Apart* Reciprocal Alternation (transitive)
2.5.6 *Apart* Reciprocal Alternation (intransitive)
3.5 Locatum Subject (non-locatum subject variant)[30]
7.8 Directional Phrases with Nondirected Motion Verbs[31]
Example: 2.5.3 Apart Reciprocal Alternation (transitive)

[28] There is no equivalent to the Dative Alternation in French (Nicholls, 1994, p. 12). Since this work began as an attempt to facilitate lexical selection in a French-English MT system, I indicate other French-English comparisons, where I have relevant data.

[29] Includes the preposition *into* as a substitute for *through.* The *through/into* variant adds telicity under the interpretation assigned in (Levin, 1993), where the notion of penetration is required (Levin, p.c.). Note, however, that other verbs appear to participate in this pattern, without the notion of penetration, e.g., the *hit* verbs, as in (i):

(i) Alison banged the car into the post.
Alison banged the post with the car.

without the notion of penetration, as in (ii):

(ii) Alison dug her elbow into Janice.
Alison dug Janice with her elbow.

It is the penetration interpretation (rather than the preposition alone) upon which the telic interpretation depends.

[30] These verbs alternate between state and accomplishment readings (Olsen, 1994a, p. 50). The locatum subject reading has both interpretations: *Water filled the pail* may either describe the process and result or the result alone. In contrast, the non-locatum subject variant—*I filled the pail with water*—has only the accomplishment interpretation. The latter variant may therefore be seen as adding both [+telic] and [+dynamic] to the verbs. Although it may seem odd to classify many of these verbs as basically states, note that the verbs themselves, e.g., *fill*, name a state rather than the associated process (cf. *pour*).

[31] It is possible that the goal phrases are telic, whereas the directional phrases are not, given their behavior in other languages, e.g., Spanish (Aske, 1989; Slobin, to appear). The notion of motion used to describe the class of verbs participating in this alternation must include the classes listed in Levin, as well as SLIDE VERBS (11.2), ROLL VERBS (51.3.1), CARRY VERBS (11.4), DRIVE VERBS (11.5), VERBS OF SUBSTANCE EMISSION (43.40), VERBS OF MOTION USING A VEHICLE (51.4.1, 51.4.2), and CHASE VERBS (51.6). Furthermore, it must **exclude** VERBS OF SMELL EMISSION (43.5) and VERBS OF MODES OF BEING INVOLVING MOTION (47.3).

I broke the twig *off (of)* the branch./I broke the twig and the branch *apart*.
Verbs: SPLIT VERBS: blow, break, cut, draw, hack, hew, kick, knock, pry, pull, push, rip, roll, saw, shove, slip, split, tear, tug, yank

The Causative/Inchoative Alternation would belong in this category but for one class of verbs.[32] This alternation applies to verbs of change of state or position, such as BREAK VERBS, BEND VERBS, and AMUSE-TYPE PSYCH-VERBS, as well as to verbs from a variety of classes that meet the semantic criteria. However, Levin (1993, p. 28) indicates that it also applies to some of the atelic ROLL VERBS (*bounce, drop, float, move, roll, slide, swing, ...* including verbs of motion around an axis: *coil, revolve, rotate, spin, turn, twirl, twist, whirl, wind*). Because of the salience of change of state to telicity (also see previous section), it would be useful to do some corpus-based research on these verbs in the causative and inchoative constructions, to see whether they do appear as atelic activities in these constructions, as in (14)(i), or whether the require addition of a telicizing constituent, such as the directional PP in (14)(ii).

(14) (i) I rolled the ball./The ball rolled.
(ii) I rolled the ball down the hill./The ball rolled down the hill.

In the Dative Alternation both variants (*Mary gave John a letter/Mary gave a letter to John*) have a goal constituent and are therefore [+telic], although the verbs participating in this alternation may be either atelic (*carry, roll*) or telic (*give, sell*). This construction appears with a wide range of verbs compatible with the notion of change of possession (Green, 1986; Goldberg, 1994). In addition, the dative adds the interpretation that the goal of the giving is animate (or composed of animates, such as a company). For example, in *John faxed Chicago a letter, Chicago* is interpreted as 'a person in the Chicago office/branch'.

The alternations in (15) are to have "affected objects", a notion not defined in (Levin, 1993) but predicating a change of state of the object. This notion is used to characterize the difference between *pound flat* in the Middle example in (15) and bare *pound,* which may not be used as a Middle (Levin, 1993, p. 26). Thus the Middle appears to require a change of state interpretation of the object. The Cognate Prepositional Phrase Alternation

[32] It is currently listed as irrelevant with respect to telicity (section 6). See (Levin, 1993, p. 29) for references to a similar phenomenon in French.

also appears to have an affected object interpretation, or perhaps a holistic interpretation (see discussion below). In this construction the PP adds further details about the new state, e.g., *buttered the bread with unsalted butter.*

(15) **Affected Object:**
1.1.1 Middle Alternation
7.2 Cognate PP Alternation
Example: 1.1.1 Middle Alternation
Bill pounded the metal flat./This metal won't pound flat.
Verbs: cut, break, ...[33]

The "holistic effect" on the predicate in objects and subjects of unaccusatives in the alternations in (16) also predicates a change of state. The object "is understood to be in some sense 'completely' affected by the action" (Levin, 1993, p. 50).[34] Thus, just as the twig in (13) changes from a 'not-broken' to a 'broken' state, the objects in the telicizing alternations in (16) are completely 'Verbed'.

(16) **Holistic Effect:**
1.4.1 Locative Preposition Drop Alternation
2.3.1 *Spray/Load* Alternation
2.3.2 *Clear* Alternation (transitive)
2.3.3 *Wipe* Alternation
Example: Locative Preposition Drop Alternation
Martha climbed up the mountain./Martha climbed the mountain.
Verbs: RUN VERBS (some): canter, climb, cross, fly, gallop, hike, jog, jump, leap, prowl, ramble, ride, roam, rove, row, run, shoot (rapids), stroll, swim, traipse, tramp, travel, trudge, vault, wade, walk, wander; VERBS THAT ARE VEHICLE NAMES (some): bicycle, bike, canoe, jeep, raft, row, sail, skate, ski

The Resultative Alternation and other related constructions also resemble the change-of-state interpretations. It is a resultative, in fact, that provides the change of state potentiating the Middle Alternation in (15) above. According to Levin (1993, p. 101), "[a] resultative phrase in an XP which

[33] No other examples are given by Levin.

[34] The notion "holistic" is not easy to characterize; indeed it may not be entirely accurate (Levin, 1993, p. 50).

describes the state achieved by the referent of the noun phrase it is predicated of as a result of the action named by the verb." That is, it names the state into which the NP is changed. Potential resultatives given by Levin include those in (17), with the exception of the Cognate Object Construction, which is included on the basis of Macfarland (1995), who analyzes the cognate object as a result object. According to Levin (1993, pp. 62,65), the *Apart* Alternations (2.5.3 and 2.5.6, included in the change-of-state category in (13)) may potentially be included with the resultatives.

(17) **Resultatives:**
1.2.7 *Way* Object Alternation
7.1 Cognate Object Construction
7.4 X*'s Way* Construction
7.5 Resultative Construction
Example: Resultative Construction
The silversmith pounded the metal flat.
Verbs: pound, hammer, push, drink, burn, walk, cry, freeze, slide...[35]

According to Levin (1993), the alternations and constructions in (18) have coming into existence and/or appearance interpretations, as illustrated by the transitive Reflexive of Appearance Alternation in (18):

(18) **Coming into existence/appearance:**
2.2 Benefactive[36]
2.4.1 Material/Product Alternation (transitive; both variants)
2.4.2 Material/Product Alternation (intransitive; both variants)
4.2 Reflexive of Appearance Alternation
Example: 4.2 Reflexive of Appearance Alternation
I presented a solution to the problem yesterday./A solution to the problem presented itself yesterday.[37]

[35]These are the verbs in the examples given by Levin (1993, p. 101) who states that "[a] wide range of verbs is found in the resultative construction, so no specific classes of verbs are identified here. However, there are also some clearly semantic constraints on the verbs found in the resultative construction: stative verbs and directed motion verbs are excluded."

[36]The benefactive may possibly be included with the affected objects. According to Nicholls (1994, p. 12), French has no equivalent construction.

[37]This alternation appears similar to the passive, or to the causative/inchoative (Levin, p.c.), since "[w]hen verbs undergoing this alternation are found with reflexive objects, their subject bears the same semantic relation to the verb as the object does in the ordinary transitive use. The argument that is the subject of the typical transitive use of the verb is not expressed" (Levin, 1993, p. 85).

Verbs: REFLEXIVE VERBS OF APPEARANCE: assert, declare, define, express, form, manifest, offer, pose, present, proffer, recommend, shape, show, suggest

Levin and Rappaport Hovav (1995b, p. 148) distinguish monadic change-of-state verbs from verbs of (coming into) existence and appearance. Among other reasons, they cite differences in informational weight, and behavior with respect to the 6.2 Locative Inversion. This study makes a different subdivision of these verbs, grouping verbs of coming into existence and appearance with verbs of change of state of the various types discussed so far, since these are all telic. In contrast, verbs of existence vary in telicity. As a result, telicity is irrelevant for alternations, such as 6.1 *There* Insertion, that apply to verbs of existence and coming into existence, although this, for Levin and Rappaport-Hovav, is a homogeneously unaccusative class

Three semantic notions which may not be subsumed under change-of-state appear to be relevant when [+telic] is added in a construction, namely contextually typical degree, reciprocal action, and dynamicity. I use the term CONTEXTUALLY TYPICAL DEGREE in (19) to refer to events, such as those represented by the 1.2.1 Unspecified Object Alternation, illustrated in (19):

(19) **Contextually typical degree**[38]
1.2.1 Unspecified Object Alternation[39]
2.7 Image Impression Alternation[40]
Example: 1.2.1 Unspecified Object Alternation
Mike ate the cake./Mike ate. (→ Mike ate a meal or something one typically eats.)
Verbs: "a wide range of activity verbs" (Levin, 1993, p. 33)

In this example, *Mike ate* means Mike ate a meal, or something sufficient to stave off his hunger for anything else of substance.[41] The construction

[38]The 1.2.3 Understood Reflexive Object Alternation might possibly be included in this category, instead of with the alternations that indicate telicity in (8).

[39]This alternation has a direct equivalent in French (Nicholls, 1994, p. 9).

[40]Levin (1993, pp. 66–67) notes that this alternation does NOT have the holistic effect: e.g., the ring is not holistically affected by inscribing in *The jeweler inscribed the name on the ring./The jeweler inscribed the ring with the name.* This property which may have an account independent of either the alternation itself or of telicity. Levin suggests that an independent account of the property would allow these verbs to be collapsed with the spray/load verbs, in the "holistic effect" subcategory above.

[41]This is noted by Tenny (1994, p. 44), although she classifies the construction as non-delimited, i.e., as atelic.

Mike ate is not used to refer to Mike's ingesting any old bit of food. Thus, if someone was considering offering Mike a sandwich, it would be odd to use *Mike ate* to describe him eating a piece of candy or an apple (unless of course that is his normal meal). The degree to which Verb-*ing* is done, therefore, depends on context; in the case of *eat,* the relevant degree must be considered a sort of meal. According to Levin (1993, p. 33), this alternation appears with "a wide range of activity verbs". The use of context to conversationally implicate a [+telic] situation is discussed in (Olsen, 1994a, pp. 42–44).[42] The 1.4.1 Locative Preposition Drop Alternation might also be included in this category, rather than in the "holistic effect" category in (16) above, since the extent of Verb-*ing* is contextual, rather than evidenced by a complete change in the object: *climbing a mountain* requires holistic traversal of a path (to the top or some relevant point) but not a change in the mountain itself.

Although the intransitive version of the Simple Reciprocal Alternation in (20) indicates telicity (see previous section), the transitive version appears to apply to both [+telic] and [$\emptyset$telic] verbs.

(20) (i) **Reciprocal action**
2.5.1 Simple Reciprocal Alternation (transitive; both variants)

(ii) **Dynamicity/agency**
7.6.1 Unintentional Interpretation with Reflexive Object[43]
7.6.2 Unintentional Interpretation with Body-Part Object

Like the intransitive, this alternation applies to verbs from a range of

[42]This category is therefore distinct from others, in depending on context rather than on semantics for the classification. Under the analysis proposed in (Olsen, 1994b; Olsen, 1994a), telicity added by context is cancellable. *Mike ate* would therefore be permitted to have an unbounded, atelic, interpretation. More study of the context in which Unspecified Objects, Understood Reflexives, and Image Impression constructions occur would be required to determine whether they do in fact have atelic readings. If they do, the alternation(s) would have to be reclassified as Irrelevant with Respect to (A)telicity.

[43]This alternation resembles the transitivizing alternations in this section, in that it appears to be the (reflexive) object that adds the telicity, as in (i):

(i) Pauline hit herself (on the doorframe) (Levin, 1993, p. 101, ex. 380)

(Compare *Pauline hit a ball*, which is an atelic semelfactive.) The telicity seems also to prefer a single event (achievement) interpretation of the semelfactives:

(ii) The car bumped.
Joan bumped herself.

This construction also exemplifies [+dynamic] situations that are not necessarily agentive (cf. (Olsen, 1994a, p. 45)).

semantic classes, including change-of-state, adding the notion of RECIPROCAL ACTION to the basic meaning. Both variants given by Levin are telic. In the PP variant (*I mixed the sugar* **into the butter**, *I separated the yolk* **from the white**), the telicity appears to come from (or be discharged on) the goal or source PP, and the NP is a theme or path. This construction provides a further example against the uniform association of telicity with transitivity, along the lines discussed in (Tenny, 1994). In the variant lacking a PP (*I mixed the sugar and the butter, I separated the yolk and the white*) the object is a conjoined NP, with conjuncts having both theme/path and source/goal properties. In both cases, it might be argued that the patient undergoes a change-of-state, i.e., separation, affiliation, etc.

The two "unintentional" interpretations (7.6.1 and 7.6.2) are related to intentional agency, and therefore more directly to DYNAMICITY ([+dynamic]) than to telicity. The reflexive object variants all appear to be [+telic], although the base verbs may be either [+telic] (*cut*),[44] or atelic (semelfactives: *nick, prick, nick,* and activities: *hurt, burn*).

Thus, alternations adding telicity frequently add the same property to the object (or unaccusative subject) found with [+telic] verbs, i.e., change-of-state, broadly interpreted as including affectedness, holistic effects, and resultatives. Alternations adding telicity may also predicate a contextually typical degree of the predicate, reciprocity, and dynamicity. In addition, the alternations listed in (21) apply uniformly to atelic predicates and may therefore be used as [∅telic] diagnostics.

(21) **Alternations adding [+telic] that are [∅telic] diagnostics**
1.1.2.2 Induced Action Alternation
1.2.1 Unspecified Object Alternation
1.2.7 *Way* Object Alternation
2.3.1 *Spray/Load* Alternation
2.3.3 *Wipe* Alternation
2.4.2 Material/Product Alternation (intransitive)
2.9 *Through/With* Alternation[45]
7.4 X*'s Way* Construction[46]

[44] This verb may, in fact, be atelic, because of its variable behavior on the telic entailment test: *John was cutting himself* entails that he cut himself, although *John was cutting the bread* does not entail that the bread was (contextually completely) cut.

[45] Indicates semelfactives.

[46] Levin and Rappaport Hovav (1995b, p. 199), and citing Jackendoff (1990, p. 213); Goldberg (1994).

7.5 Resultative Construction
7.8 Directional Phrases with Nondirected Motion Verbs

The two alternations given in (22) would also serve as atelic diagnostics, if the verb *cut* were not classified as [+telic] (see footnote 32).

(22) **Additional possible [∅telic] diagnostics**
7.6.1 Unintentional Interpretation with Reflexive Object
7.6.2 Unintentional Interpretation with Body-Part Object

5 Alternations Indicating [∅telic]

For 13 other alternations, listed in (23), not only the bare verbs but both alternation variants are uniformly atelic. Section 2.11 lists six variants of the *Search* Alternations. Suffixes 1–6 (e.g., 2.11.1) have therefore been added to the numbers in Levin, to distinguish them from each other.

(23) 1.1.3 Substance/Source Alternation
1.3 Conative Alternation
2.8 *With/Against* Alternation
2.10 *Blame* Alternation
2.11.1 HUNT VERBS: all patterns
2.11.3 STALK VERBS: NP for/in NP
2.11.4 INVESTIGATE VERBS: NP for NP
2.11.5 RUMMAGE VERBS: through NP for NP
2.11.6 FERRET VERBS: NP out NP
2.13.3 Possessor and Attribute Object Alternation
3.7 Container Subject Alternation
3.8 Raw Material Subject Alternation
3.10 Source Subject Alternation

Three alternations—Container Subject, Raw Material Subject, and Source-Subject Alternations—also indicate [∅dynamic] as well as [∅telic], since verbs in these alternations are found with stative as well as dynamic interpretations. Levin gives examples of the Container and Raw Material Subject Alternations in the present tense, more common for stative verbs, rather than in the simple past she usually uses. Although dynamicity is often associated with agency ((Olsen, 1994a, p. 45) and references therein), the Source/Subject Alternation illustrates situations that are [+dynamic] but non-agentive, as in (24).

(24) The middle class will benefit from the new tax laws.
The new tax laws will benefit the middle class.

The Possessor and Attribute Object alternation may also be used to indicate [∅dynamic], if the ADMIRE-TYPE PSYCH-VERBS found in this alternation are considered states (*admire, love, dread, envy*). The Substance/Source Alternation is also illustrated in the present tense (*The sun radiates heat/Heat radiates from the sun*).[47]

Both the Conative and the *With/Against* Alternations appear to prefer semelfactive interpretations—[+dynamic, ∅durative, ∅telic], according to Olsen (1994a, pp. 58–60). For example, the conatives in (25) appear to denote a single punctiliar instance of hitting and kicking.

(25) (i) Frank Thomas hit at the low slider.
(ii) Hanne kicked the ball at the goal.

Even apparently [+telic] verbs, such as *smash* do not implicate an effect in these constructions (Levin, 1993, p. 67). If these alternations were found to be semelfactive-creating it would violate monotonicity, since they apply to [+durative] activities, such as *spray (spray (water) at/against the wall)*, as well as semelfactives. Under the privative analysis of lexical aspect, then, the semelfactive interpretations must be cancellable, as in (26).[48]

(26) (i) Frank Thomas hit at the low slider repeatedly.
(ii) Hanne kicked the ball at the goal vigorously for ten minutes.

Unlike the alternations indicating and adding [+telic], the alternations in this category do not cluster around semantic properties. Some (the Conative and the *With/Against* Alternations) entail that their objects undergo no change of state. However others (*Blame,* Container Subject, and Raw Material Subject alternations) have change-of-state characteristics. Idiosyncratic behavior overlapping with characteristics of telic and telicizing alternations is expected under a privative analysis of telicity, in which only the members of the marked class ([+telic]) are semantically homogeneous. Furthermore,

[47] Levin and Rappaport Hovav (1995b, pp. 237–238) suggest that these verbs may sometimes have appearance meanings; under such an analysis they would have to be [+dynamic] rather than stative [∅dynamic].

[48] Actually, under the privative analysis, the activities should not have a semelfactive interpretation at all, since they are marked [+durative].

at least some of these alternations, e.g., the Conative Alternation, are incompatible with the notion of [+telic]. These alternations may therefore be used to identify [∅telic] verbs and predicates, apparently without the interference of other constituents or pragmatic implicature adding [+telic] to them. Investigating why these alternations prohibit the [+telic] feature marking may yield additional insights into the nature of telicity, although it is beyond the scope of this study.

6 Alternations For Which (A)telicity is Irrelevant

For 36 alternations, listed in (27), telicity and its unmarked counterpart (atelicity) appear to be simply irrelevant. That is, neither the base verbs nor the variants in the alternation are homogeneously [+telic] or [∅telic] classes.

(27) 1.1.2.1 Causative/Inchoative Alternation
1.1.2.3 Other Causative Alternations
1.2.2 Understood Body-Part Object Alternation
1.2.4 Understood Reciprocal Object Alternation
1.2.5 PRO-arb Object Alternation[49]
1.2.6.1 Characteristic Property of Agent Alternation
1.2.6.2 Characteristic Property of Instrument Alternation[50]
1.2.8 Instructional Imperative
1.4.2 *With* Preposition Drop
2.3.4 *Swarm*[51]
2.5.2 *Together* Reciprocal Alternation (transitive)
2.5.5 *Together* Recip. (intransitive)
2.11.2 *Search* VERBS: V NP for NP, V for NP PP
2.12 Body-Part Possessor Ascension Alternation
2.13.1 Possessor Object
2.13.2 Attribute Object
2.13.4 Possessor Subject (transitive)
2.13.5 Possessor Subject (intransitive)

[49] Found with a wider set of verbs in Italian (Levin, 1993, p. 38).
[50] Direct equivalent in French (Nicholls, 1994, p. 9).
[51] Although agency is often associated with [+dynamic] (see (Olsen, 1994a, p. 45) and references therein), the non-locative variant of this alternation denotes events without agents, e.g., *The garden is swarming with bees* (cf. *Bees swarmed in the garden*).

3.1 Time Subject
3.6 Location Subject
3.9 Sum of Money Subject
4.1 Virtual Reflexive[52]
5.1 Verbal Passive
5.2 Prepositional Passive
5.4 Adjectival Perfect Participles (intransitive)
6.1 *There* Insertion
6.2 Locative Inversion[53]
7.3 Reaction Object
7.7 Bound Nonreflexive Anaphor as Prepositional Object
8.1 Obligatory Passive
8.2 Obligatorily Reflexive Object
8.3 Inalienably Possessed Body-Part Object
8.4 Expletive *It* Object
8.5 Obligatory Adverb
8.6 Obligatory Negative Polarity Element

A few alternations, notably those with section numbers beginning with 8, are listed as irrelevant to (a)telicity because they apply only to a small number of verbs. However, most of the alternations are in this category because they apply to both manner (atelic) and (manner)-result ([+telic]) verbs. For example, the 2.11.2 *Search* VERB pattern applies to the *Search* VERB class, including the manner verb *quarry* as well as the result verb *excavate*. Other alternations apply to both [+telic] and atelic verbs, although the verb classes to which they apply are themselves homogeneous. For example, the 1.1.2.1 Causative/Inchoative Alternation, also discussed in section 4, applies to [+telic] change of state verbs (BREAK VERBS, BEND VERBS, AMUSE-TYPE PSYCH-VERBS, and other verbs of change of state (Levin, 1993, pp. 28–29)), as shown in (28), and to the atelic ROLL VERBS. Neither variant of this alternation marks [+telic] on these forms, as (29) shows.

(28) I broke the glass./The glass broke.

(29) I rolled the ball./The ball rolled.

[52]This construction is similar to the middle, but not coextensive with it; it is "restricted and not easily tied to particular semantic classes of verbs" (Levin, 1993, p. 84).
[53]Direct equivalent in French (Nicholls, 1994, p. 9).

Similarly, 6.1 *There* Insertion applies to both types of verbs, since the construction requires them to have (or allow) an existence [∅telic] or appearance [+telic] sense (Levin, 1993, pp. 89–91).

The 2.13.1 Possessor Object Alternation also applies to verb classes that are themselves homogeneous: the atelic ADMIRE-TYPE PSYCH VERBS, JUDGMENT VERBS, and WANT VERBS, as well as the [+telic] VERBS OF ASSESSMENT. The 2.12 Body-Part Possessor Ascension Alternation is another interesting split alternation. The TOUCH VERBS and VERBS OF CONTACT BY IMPACT are both atelic verbs of contact. The former are "pure verbs of contact" (Levin, 1993, p. 156), and the latter also indicate impact; neither requires an effect.[54] In contrast, the alternation also applies to POKE and CUT VERBS, which specify a [+telic] effect, in addition to motion and contact.[55]

Alternations in this section also demonstrate that the semantic underpinnings of telicity, specifically those clustering around the change of state notion, need to be refined further, since several alternations that are irrelevant to (a)telicity nevertheless exhibit similar change-of-state properties. I discuss four of them.

The 1.2.5 PRO-arb Object Alternation and the 1.2.8 Instructional Imperative are both listed by Levin as requiring an "affected object" (Levin, 1993, pp. 38,40). However, the notion of affected object associated with the latter is different from the [+telic] affected object in, e.g., the middle construction, since the verbs in the Instructional Imperative seem to denote activities (*bake, stir*) rather than [+telic] situations.[56]

Similarly, the *with* variant of the 2.3.4 *Swarm* Alternation has the "holistic" change-of-state-like interpretation without being telic, as in *The garden swarmed with bees.* The locative variant, *Bees swarmed in the garden,* is neither telic nor holistically interpreted. Perhaps the failure of this alternation to add [+telic] with the holistic interpretation may be attributed to the [∅dynamic] requirement, since states are rarely [+telic] (Olsen, 1994a, pp. 61–63). Finally, Levin (1993, p. 62) suggests that the transitive *Together*

[54] The TOUCH VERBS alternate between state (no effect) and accomplishment readings (effect, i.e., [+telic], implicated). The VERBS OF CONTACT BY IMPACT generally have semelfactive (atelic) interpretations, with no effect implicated (Levin, 1993, pp. 148–153).

[55] Because the *Through/with* Alternation is a defining characteristic of this class, the puncturing interpretation is required, as opposed to *poking with one's finger* (also Levin, p.c.).

[56] Perhaps they are implicated to be [+telic] in the instructional context (*bake for 30 minutes, stir (a reasonable amount until mixed),* etc.), in which case the alternation could be classified as adding telicity.

Reciprocal Alternation (2.5.2) alternation may be a type of resultative, but the resultative interpretation is only available to the *together* variant of verbs that have a base [+telic] reading (e.g., *mix together*). Atelic verbs have an activity reading in this construction (e.g., *talk/speak together)*.

Several alternations, although irrelevant to (a)telicity, relate to dynamicity. The 7.3 Reaction Object in (30) appears similar to the 7.1 Cognate Object Construction in (30) (discussed in section 4; see (Macfarland, 1995)).

(30) Lyn smiled her thanks. Lyn smiled her lovely smile.

To the extent that it is, it may be similarly analyzed, as indicating [+dynamic] (i.e., not applying to states) and possibly adding [+telic]. In contrast, the 3.6 Location Subject Alternation, indicates [∅dynamic], that is, it applies only to states, as in *This room sleeps five people*. Agentive subjects in the non-location variant add [+dynamic]: *We sleep five people in that room.* Other alternations indicating [∅dynamic] of the verbs and adding [+dynamic] in one variant are listed in (31), including those from previous sections.[57]

(31) 2.13.4 Possessor Subject (transitive) (section 4)
 3.7 Container Subject Alternation (section 5)
 3.6 Location Subject
 3.8 Raw Material Subject Alternation (section 5)
 3.9 Sum of Money Subject
 3.10 Source Subject Alternation (section 5)

The Possessor and Attribute Object Alternation (2.13.3) also indicates [∅dynamic], although it does not add dynamicity in either variant.

Thus the alternations irrelevant to (a)telicity do not show homogeneous behavior, as expected under a privative analysis of telicity. Some relate to dynamicity, others do not interact with lexical aspect at all. Interestingly, none of the alternations appears to be relevant to the third lexical aspect feature, [+durative], or its complement, punctiliarity. However a few relate to notions similar to those underpinning telicity. Whether these apparent exceptions can be resolved by a more refined characterization of the alternations and the semantic and syntactic characteristics of telicity is a subject for future research.

[57] Note the number of subject alternations that indicate [∅dynamic], with agency correlating with a change in subject as well as a change to [+dynamic]. Perhaps these alternations are conditioned by configurations of proto-agent/proto-patient properties (Dowty, 1991).

7 Unclassifiable Alternations

Levin (1993) does not list many verbs participating in the alternations listed in (32).

(32) **3.2 Natural Force Subject Alternation**
I dried the clothes in the sun./The sun dried the clothes.
3.3 Instrument Subject Alternation
David broke the window with a hammer./The hammer broke the window

These alternations, unlike those from Levin section 8 that are irrelevant to telicity, do not appear to apply idiosyncratically. Nor do they relate to dynamicity, as do many other subject alternations (see (31) above). Further research is needed (see references in (Levin, 1993, pp. 79,80)).

8 Conclusion

This study has focused on alternations that apply to uniformly telic (and atelic) classes of verbs, or yield uniformly telic (or atelic) constructions. It has assumed that the semantic notions manipulated by these alternations may provide insight into the semantic underpinnings of telicity as well. The results suggests that telicity is a complex semantic notion. The data supports a relationship between telicity and change of state, but shows that it must be refined, particularly with respect to the alternations in which telicity and change of state (even in its broad definition) do not cooccur. Some alternations interact with telicity but not change of state, denoting contextually typical degree, reciprocal action, and dynamicity (sections 3–4). Others alternations denote a type of change of state but indicate atelicity (section 5: 2.10 *Blame*, 3.7 Container Subject, and 3.8 Raw Material Subject alternations) or are irrelevant to (a)telicity (section 6: 1.2.5 PRO-arb Object alternation, 1.2.8 Instructional Imperative, and 2.5.2 *Together* Reciprocal Alternation).

In addition to a beginning of a semantic characterization of telicity, this study proposed several alternations for identifying [+telic] verbs and predicates. It has also revealed that certain frames may be used for identifying atelicity, despite its generally variable behavior (sections 5 and 6). Using these diagnostics should aid the lexical aspect classification of verbs and predicates, as well as unearthing new data on the alternations themselves.

A Alternations by Their Relation to Telicity

This appendix summarizes the grouping of alternations into categories that are relevant to the identification of (a)telicity of verbs and predicates.

A.1 Alternations indicating [+telic]

1.2.3 Understood Reflexive Object Alternation
2.3.5 Clear Alternation (intransitive)
2.4.3 Total Transformation Alternation (transitive)
2.4.4 Total Transformation Alternation (intransitive)
2.6 Fulfilling Alternation
3.4 Abstract Cause Subject Alternation
?5.3 Adjectival Passive
2.5.4 Simple Reciprocal Alternation (intransitive)

A.2 Alternations adding [+telic]

1.1.1 Middle Alternation
1.1.2.2 Induced action
1.2.1 Unspecified Object Alternation
1.2.7 *Way* Object Alternation
1.4.1 Locative Preposition Drop Alternation
2.1 Dative Alternation (both variants)
2.2 Benefactive
2.3.1 *Spray/Load* Alternation
2.3.2 *Clear* Alternation (transitive)
2.3.3 *Wipe* Alternation
2.4.1 Material/Product Alternation (transitive; both variants)
2.4.2 Material/Product Alternation (intransitive; both variants)
2.5.1 Simple Reciprocal Alternation (transitive)
2.5.3 *Apart* Reciprocal Alternation (transitive)
2.5.6 *Apart* Reciprocal Alternation (intransitive)
2.7 Image Impression Alternation
2.9 *Through/With* Alternation (*Through* variant)
2.14 *As* Alternation (Double object variant)
3.5 Locatum Subject Alternation
4.2 Reflexive of Appearance Alternation
7.1 Cognate Object Construction

7.2 Cognate PP Alternation
7.4 X*'s Way* Construction
7.5 Resultative Construction
7.6.1 Unintentional Interpretation with Reflexive Object
7.6.2 Unintentional Interpretation with Body-Part Object
7.8 Directional Phrases with Nondirected Motion Verbs

A.3 Alternations adding [+telic] that are [∅telic] diagnostics

1.1.2.2 Induced Action Alternation
1.2.1 Unspecified Object Alternation
1.2.7 *Way* Object Alternation
2.3.1 *Spray/Load* Alternation
2.3.3 *Wipe* Alternation
2.4.2 Material/Product Alternation (intransitive)
2.9 *Through/With* Alternation
7.4 X*'s Way* Construction[58]
7.5 Resultative Construction
7.8 Directional Phrases with Nondirected Motion Verbs

A.4 Additional possible [∅telic] diagnostics

Note: This section assumes that the verb *cut* is not [+telic].
7.6.1 Unintentional Interpretation with Reflexive Object
7.6.2 Unintentional Interpretation with Body-Part Object

A.5 Alternations indicating [∅telic]

1.1.3 Substance/Source Alternation
1.3 Conative Alternation
2.8 *With/Against* Alternation
2.10 *Blame* Alternation
2.11.1 HUNT VERBS: all patterns
2.11.3 STALK VERBS: NP for/in NP
2.11.4 INVESTIGATE VERBS: NP for NP
2.11.5 RUMMAGE VERBS: through NP for NP
2.11.6 FERRET VERBS: NP out NP

[58](Levin and Rappaport Hovav, 1995b, p. 199) and (Jackendoff, 1990, p. 213), cited therein.

2.13.3 Possessor and Attribute. Object Alternation
3.7 Container Subject Alternation
3.8 Raw Material Subject Alternation
3.10 Source Subject Alternation

A.6 Alternations for which (a)telicity is irrelevant

1.1.2.1 Causative/Inchoative Alternation
1.1.2.3 Other Causative Alternations
1.2.2 Understood Body-Part Object Alternation
1.2.4 Understood Reciprocal Object Alternation
1.2.5 PRO-arb Object Alternation
1.2.6.1 Characteristic Property of Agent Alternation
1.2.6.2 Characteristic Property of Instrument Alternation
1.2.8 Instructional Imperative
1.4.2 *With* Preposition Drop
2.3.4 *Swarm*
2.5.2 *Together* Reciprocal Alternation (transitive)
2.5.5 *Together* Recip. (intransitive)
2.11.2 SEARCH VERBS: NP for NP, V for NP NP
2.12 Body-Part Possessor Ascension Alternation
2.13.1 Possessor Object
2.13.2 Attribute Object
2.13.4 Possessor Subject (transitive)
2.13.5 Possessor Subject (intransitive)
3.1 Time Subject
3.6 Location Subject
3.9 Sum of Money Subject
4.1 Virtual Reflexive
5.1 Verbal Passive
5.2 Prepositional Passive
5.4 Adjectival Perfect Participles (intransitive)
6.1 *There* Insertion
6.2 Locative Inversion
7.3 Reaction Object
7.7 Bound Nonreflexive Anaphor as Prepositional Object
8.1 Obligatory Passive
8.2 Obligatorily Reflexive Object
8.3 Inalienably Possessed Body-Part Object

8.4 Expletive *It* Object
8.5 Obligatory Adverb
8.6 Obligatory Negative Polarity Element

A.7 Questionable Alternations

3.2 Natural Force Subject Alternation
3.3 Instrument Subject Alternation

A.8 Alternations Indicating [$\emptyset$dynamic] and adding [+dynamic]

2.13.4 Possessor Subject (transitive) (section 4)
3.7 Container Subject Alternation (section 5)
3.6 Location Subject
3.8 Raw Material Subject Alternation (section 5)
3.9 Sum of Money Subject
3.10 Source Subject Alternation (section 5)

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