

# GRADIENTS IN AUXILIARY SELECTION WITH INTRANSITIVE VERBS

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The primary purpose of this study is to present evidence, based on experimental data from Western European languages, that there is orderly variation in the choice of perfective auxiliary with intransitive verbs. Specifically, auxiliary selection is sensitive to a hierarchy of aspectual/thematic verb types: some verbs require a given auxiliary categorically, whereas others allow both auxiliaries to a greater or lesser extent depending on their position on the hierarchy. It is argued that this gradience has potentially important implications for the UNACCUSATIVE HYPOTHESIS, and more generally for theories of the lexicon-syntax interface.\*

**1. AUXILIARY SELECTION.** The starting point of this article is a number of facts about the selection of perfective auxiliaries BE and HAVE<sup>1</sup> in Romance and Germanic languages:

- across languages/varieties, some verbs tend to be consistent in auxiliary selection, whereas others select one auxiliary in some languages/varieties and the other auxiliary in other languages/varieties (see e.g. Sankoff & Thibault 1977 on Canadian and European French; Benincà 1985, Loporcaro 1998, Sorace & Cennamo 2000 on Italian dialects; Keller & Sorace 2000 on German varieties).

- within languages, some verbs tend to be syntactically consistent,<sup>2</sup> in the sense that they invariably select the same auxiliary in all contexts; other verbs have variable

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<sup>1</sup> I have adopted the following conventions throughout the article: generic references to equivalents of HAVE and BE across languages are in small caps (e.g. BE, HAVE); references to auxiliaries in individual languages are in italics (Dutch *zijn/hebben*; French *être/avoir*; German *sein/haben*; Italian *essere/avere*).

<sup>2</sup> A referee raises the question of whether it is possible to talk about verbs being 'the same' across languages: in what sense, for example, are the French verb *emparer* and the Italian verb *imparare* the same verb? There are complex philosophical and linguistic aspects to this question that would fall outside the scope of this article. At a general level, it suffices to say that all typological comparisons must assume at least partial equivalence of meaning among verbs; moreover, the fact that the crosslinguistic comparisons in this article involve typologically related languages ensures that verbs tend to share the same connotations. In the more specific context of research on the syntax-semantics interface, two verbs are 'the same' if they share the same syntactically relevant semantic components. So, for example, Italian *arrossire* and Dutch *bloezen* are different precisely with respect to those components of meaning that determine their syntactic status. The former is conceptualized as a change-of-state verb, whereas the latter is rather an internal process. This difference is reflected in the choice of auxiliaries (see Levin and Rappaport Hovav 1995 for further discussion and examples).

A further related question is whether it can be said that a verb that receives different meaning within the same language is 'the same verb' in all these meanings. Again, research on variable-behavior verbs shows that, leaving aside accidental polysemy, multiple meanings are systematically associated with different syntactic patterns. The aim of this research is to identify the constraints on the range of argument expressions that verbs may have (see Levin & Rappaport Hovav 1996, Rappaport Hovav & Levin 1998).

behavior: they often select either auxiliary in the same context (Levin & Rappaport Hovav 1995).

- some verbs tend to select the same auxiliary regardless of the contribution of other aspectual or thematic elements in the sentence in which they appear, whereas other verbs are sensitive to compositional factors and switch auxiliaries in particular contexts (Hoekstra & Mulder 1990; Pustejovsky & Busa 1995, Perlmutter 1989, Arad 1998a).
- native speakers of any given language have clear and determinate intuitions about the auxiliary selection behavior of some verbs: they strongly prefer sentences in which the verb appears with the 'correct' auxiliary to those in which it appears with the 'wrong' auxiliary. Other verbs tend to elicit more indeterminate intuitions, in the sense that native speakers do not have such clear preferences for the former over the latter (see Bard et al. 1996, Sorace 1992).
- the syntax of auxiliary selection tends to be acquired earlier with certain verbs and later with others, both in first and second language acquisition (van Hout et al. 1993, Sorace 1993a, b; 1995a, b, Sorace & Shomura 2000.).
- some verbs are diachronically stable in their auxiliary selection behavior, whereas others are more vulnerable to change. This is particularly evident in the Romance languages, which have been undergoing a diachronic change leading to the progressive replacement of BE by HAVE (Benzing 1931, Berruto 1987, Rohlf's 1969, Tuttle 1986, Vincent 1982).

These facts emerge from two sources. The first source is the literature on split intransitivity, and particularly the vast body of research originated by the UNACCUSATIVE HYPOTHESIS, in which auxiliary selection is widely regarded as a reliable marker of the unaccusative or unergative status of verbs. This research (which will be briefly reviewed in §5) has uncovered a great number of regularities in the mapping from lexical semantics to syntax for particular languages, but it has only begun to address the question of variable verb behavior in detail and from a crosslinguistic perspective (see Levin & Rappaport Hovav 1996 for an overview).

The second source is a recent series of studies (Sorace 1992, 1993a, b, 1995a, b, Sorace & Vonk 1998, Bard et al. 1996, Bard et al. 1998, Keller & Sorace 2000, Sorace & Cennamo 2000) that examine variation in the syntactic behavior of verbs from a psycholinguistic perspective. These studies have developed a way of operationalizing and measuring the strength of preferences expressed by native speakers and non-native speakers for grammatical sentences over their ungrammatical counterparts. They have revealed discrepancies between the linguistic intuitions of native speakers and prescriptive grammar rules, and indicate that variation in auxiliary selection is both more widespread and more systematic than previously assumed.<sup>3</sup>

I build on both sources and provide a unifying generalization for these facts, which is meant to be the article's primary contribution. I argue that the choice of auxiliary with monadic nonreflexive intransitive verbs is sensitive to both aspectual and thematic parameters, which define a structured hierarchy of verb types. The extremes of the hierarchy consist of maximally distinct 'core' verbs, which consistently select different auxiliaries; peripheral verb types closer to the center are susceptible to variable auxiliary

<sup>3</sup> Most of these studies employ magnitude estimation techniques for the elicitation of linguistic acceptability judgments (see Bard et al. 1996 for details). These techniques allow the direct measurement of the strength of preferences that speakers report for particular sentences. In the case of auxiliaries, these techniques make it possible to gauge the distance between the two auxiliaries with the same verbs: the larger the distance, the stronger the preference for one auxiliary over the other.

choice. While auxiliary selection with noncore verbs may vary across languages because different languages may have different cutoff points along the hierarchy, the choice of auxiliary with core verbs is largely invariant across languages. Experimental and typological evidence from Western European languages indicates that the extent of variation in auxiliary selection with intransitive verbs, both within and across languages, is a function of the position of a verb on the hierarchy. This suggests that the lexical knowledge of native speakers subsumes these hierarchies.

There are some important questions that I do not attempt to address. First, the reader will not find an explanation of why particular semantic components are more crucial to the selection of particular auxiliaries than others. To a large extent, this is a criticism that still applies to all the existing accounts of auxiliary selection as a marker of split intransitivity (as originally pointed out by Grimshaw 1987).

Second, the article offers data and generalizations about auxiliary selection, rather than split intransitivity in general. Only a demonstration that the hierarchy affects other manifestations of split intransitivity (both in Western European and in typologically unrelated languages) would allow one to conclude that the hierarchy underlies the syntactic distinction as a whole. While research on this is in progress, and suggests that other reflexes of unaccusativity-unergativity might indeed be sensitive to the hierarchy,<sup>4</sup> it falls outside the scope of this article. The existence of the gradients described here, however, raises some fundamental questions about the relationship between the structural and the lexical meanings of verbs, which are relevant to all current approaches to the nature of the lexicon-syntax interface. Some of these questions will be touched on in §5.

Finally, this article will not deal with pronominal verbs, which pose a potential problem for the claim that auxiliary selection is semantically determined: all verbs marked with the clitic *si/se* select auxiliary 'be' in Italian and French, regardless of their semantic characterization (but see Kayne 1993 for evidence of variation in many Italo-Romance varieties). In German and Dutch reflexive verbs select 'have', possibly as a consequence of the fact that these languages do not have cliticization (Haider & Rindler-Schjerve 1987).<sup>5</sup> Although this question needs further exploration, it will not be addressed here.

**2. GRADIENCE IN SPLIT INTRANSITIVITY: A BASIC ASPECTUAL FRAMEWORK.** I assume that auxiliary selection, like many other kinds of syntactic behaviour, is sensitive to both aspectual and thematic dimensions (Grimshaw 1990, Baker 1997). Verbs that are maximally specified along one or the other dimension tend to be categorical in their choice of auxiliary: the two key notions are telic change, which strongly correlates with BE,

<sup>4</sup> Sorace (1995a) shows evidence that the intuitions of Italian native-speakers on *ne*-cliticization display a similar gradient pattern as those on auxiliary selection, and the construction is acquired by learners of Italian in the same developmental sequence. A referee said that native Italian speakers are often confused over whether *ne*-cliticization is allowed with verbs such as *arrossire* 'blush' and *annerire* 'blacken'. This is precisely the finding in Sorace's study: these verbs denote change of condition and are less determinate than change-of-location verbs, with respect to both auxiliary selection (*avere* is dispreferred but not categorically rejected) and *ne*-cliticization. Moreover, Sorace and Shomura (2000) investigate the acquisition of split intransitivity in Japanese and provide evidence that quantifier floating, one of the recognized diagnostics of unergativity, is affected by the hierarchy.

<sup>5</sup> A well-known analysis of reflexives in Romance regards the reflexive clitic as a marker of a lexical operation which 'absorbs' the external argument, binding it to the internal argument (for discussion, see Grimshaw 1990 and Alsina 1996). Under this analysis, reflexive verbs are unaccusative.

and agentive unaffecting process, which strongly correlates with HAVE. Verbs that are underspecified with respect to one or both dimensions exhibit variation.

In line with much recent research (for example, Grimshaw 1990, van Hout 1996, Pustejovsky 1995) let us assume that each predicate is associated with an event-structure template that can be conceptualized in terms of two distinct aspectual subevents: a process, on the one hand, and a transition or a state, on the other. Simple event structures can be combined to form complex event structures through a process of event composition (Rappaport Hovav & Levin 1998, Pustejovsky 1995): processes, for example, can be expanded into transitions by the addition of a PP (as in *John swam* vs. *John swam to the shore*) or by the addition of a resultative phrase (as in *Paul hammered the metal* vs. *Paul hammered the metal flat*). All transitions necessarily include a state component in their semantics, which denotes either a final or an interim achievement of a conclusion. The structure of the second subevent is therefore itself hierarchical, with 'state' being a proper component of 'transition.'

The notion of causation separates monadic (e.g. *arrive*) from dyadic verbs of transition (e.g. *break*). Internal causation (which subsumes the notion of agentivity) is only of secondary relevance for monadic verbs of transition. In line with Levin & Rappaport Hovav 1995, I assume that externally caused verbs are basically dyadic both in their transitive (e.g. *The child broke the glass*) and in their intransitive form (e.g. *The glass broke*). Dyadic verbs will be dealt with separately in §3.5, where I argue that they have more unstable valency than monadic verbs.

All verbs denoting processes are atelic but they can be further differentiated according to three criteria. The primary differentiating factor is the nature of the causation determining the process denoted by the verb. There is an asymmetry between agentivity and internal causation: all process verbs are internally caused in the sense that they are brought about by a causer, but they vary systematically in the extent to which the causer is an intentional agent (for more detailed discussion of the syntactic differences between agents and causers, see Arad 1998a). Affectedness and density are secondary factors which interact with agentivity. Process verbs may vary in affectedness, depending on whether the action denoted by the verb implies an effect on the causer. As McClure (1995) points out, the subject of an activity is both the agent and the experiencer of the process; but activities vary in the extent to which they emphasize either one or the other.<sup>6</sup> Density refers, in simple terms, to the extent to which one can find a smaller version of the predicate within the predicate itself. More formally, density may be regarded as a subinterval property of processes and states (see McClure 1995: 94, 99), whereby the minimum length of the subinterval necessary to recognize the predicate is a function of the nature of the predicate itself.<sup>7</sup> On the assumption that they consist of the (potentially) indefinite repetition of the same steps, processes vary with respect to the homogeneity of the sequence of steps they consist of. Density is low for dynamic activity verbs such as *work*, which have a coarser structure with respect to the number

<sup>6</sup> Foley and van Valin (1984) and Centineo (1986) adopt the term ACTOR as a 'macrorole' that subsumes the semantic roles of agent (the volitional performer of an action), and EFFECTOR (the not necessarily volitional performer of the action that undergoes the change described by the verb). In their terminology, the latter is an 'affected actor'.

<sup>7</sup> As Pulman suggests, '[Processes] are not homogenous in the same way as states, in two senses: firstly, processes are regarded as consuming input or proceeding via a series of micro-events many of which could be singled out for an alternative linguistic characterization if necessary. Secondly, especially where plurality, iteration, or other coercion factors are involved, there is a lower bound on the divisibility of processes' (1997:286).

of steps that together represent an instance of the predicate; it is high for verbs denoting stative activity such as *stink*, for which every subinterval is identical to the predicate itself.

**2.1. THE AUXILIARY SELECTION HIERARCHY.** Let us now consider the variation in auxiliary selection in the light of the thematic and aspectual framework outlined above. The differential susceptibility of (monadic) intransitive verbs to variable auxiliary selection is captured by the hierarchy below, henceforth referred to as the AUXILIARY SELECTION HIERARCHY (ASH).

CHANGE OF LOCATION	selects BE (least variation)
CHANGE OF STATE	
CONTINUATION OF A PRE-EXISTING STATE	
EXISTENCE OF STATE	
UNCONTROLLED PROCESS	
CONTROLLED PROCESS (MOTIONAL)	
CONTROLLED PROCESS (NONMOTIONAL)	selects HAVE (least variation)

TABLE 1. The auxiliary selection hierarchy.

Let us begin by looking at the lexical semantic characterization of verbs denoting transitions and states.<sup>8</sup>

**3. TRANSITIONS AND STATES.** The lexical semantic representation of transition and state verbs is defined by two dimensions: (a) the extent to which the verb represents a change, or its degree of dynamicity; (b) if it represents a change, the degree of telicity (DELIMITEDNESS, Tenny 1994) expressed by the change. Cutting across these distinctions is the secondary dimension of concreteness vs. abstractness, which distinguishes between concrete and abstract changes, and between concrete and abstract states. In contrast, the notion of causation (and therefore that of agentivity) is a secondary interacting factor whose relevance for auxiliary selection is inversely proportional to the degree of telicity of verbs.

**3.1. CHANGE-OF-LOCATION VERBS.** Verbs expressing a change of location, which involve a concrete displacement from one point in space to another, are those that have the highest degree of dynamicity and telicity.<sup>9</sup> These verbs are consistent in their choice of auxiliary BE across languages; native speakers have categorical intuitions about the acceptability of BE and the unacceptability of HAVE. Italian auxiliary *essere* is first acquired with these verbs.

- (1) a. Maria è venuta alla festa (Italian)  
 Maria is come to the party  
 'Maria came to the party.'
- b. Marie est arrivée en retard (French)  
 Marie is arrived late  
 'Marie arrived late.'
- c. De brief is met de tweede post gekomen (Dutch)  
 the letter is with the second post arrived  
 'The letter arrived with the second post.'

<sup>8</sup> Conventional marks, such as the asterisk, question mark, and combinations of the two, are employed to denote the acceptability status of examples. These markers refer both to the intermediate acceptability of examples in attested nonstandard usage and to their status in the linguistic intuitions of native speakers.

<sup>9</sup> A referee points out that many of these verbs focus on the initial, rather than the final, state (e.g. *leave*), but they still denote a delimited event, in Tenny's sense.

- d. Der Zug ist spät angekommen (German)  
 the train is late arrived  
 'The train arrived late.'

Most of the verbs that consistently select *être* in European French belong to this class. Frozen uses of auxiliary BE in languages that lost a choice of auxiliaries, such as Romanian and English, are found with some verbs in this class (see Avram 1994 on Romanian, in which these uses have an adjectival meaning for most speakers).

- (2) Mama e deja plecată/ a plecat (Romanian)  
 mother-the is already left/ has left  
 'Mother is already gone.'
- (3) The Lord is come.

One important feature of change of location verbs is that they select BE regardless of other aspectual features contributed by the sentence in which they appear. The detelicization of the predicate, for example, does not have an impact on auxiliary selection. This is shown by the Italian example in 4, where the auxiliary remains *essere* despite the atelicity of the predicate.

- (4) Sono arrivati ospiti per ore e ore  
 are arrived guests for hours and hours  
 'Guests arrived for hours.'

Similarly, agentivity (or lack of it) does not affect auxiliary choice with these verbs, as shown in 5. More generally, this confirms the irrelevance of causation for this verb type.

- (5) a. Maria è caduta apposta per farci spaventare (agentive)  
 Maria is fallen on purpose to make-us scare  
 'Maria fell on purpose to scare us.'
- b. Il bicchiere è caduto dal tavolo (nonagentive)  
 the glass is fallen from-the table  
 'The glass fell from the table.'

To summarize, inherently telic verbs of change of location consistently select auxiliary BE, both across languages and within individual languages, regardless of the agentivity of their single argument or the sentence-level contribution of other elements within the predicate. Native speakers of these languages have categorical intuitions about these verbs: they strongly accept BE and reject HAVE.

**3.2. CHANGE-OF-STATE VERBS.** Next along the hierarchy are monadic verbs denoting a change of state other than a telic change of location.<sup>10</sup> The verbs belonging to this group are in most cases 'indefinite change' verbs, such as verbs of directed motion (*rise, descend*) and internally caused verbs of change of state (*become, wilt, bloom, decay*), which express a change in a particular direction without specifying a telic endpoint. Significant exceptions are the verbs *die* and *be born*, which are inherently telic verbs of change of state.

Although indefinite change verbs do not encode delimitedness, they incorporate the notion of attainment of a further degree with respect to a given dimension; they therefore imply a series of interim states and of gradual approximation to a *telos* which is not

<sup>10</sup> Many verbs of change of state are anticausative, that is, dyadic verbs with a transitive alternant (see §3.5). In this section I include only the verbs of change of state that do not participate in transitive-intransitive alternations.

necessarily reached (if something cools, it goes through a series of progressively cooler states, even though it may not become cold). There appear to be two types of such verbs (see Bertinetto and Squartini 1995): those that tend to trigger an interpretation in which the telos is reached (e.g. *decay*), and those that favor the interpretation in which there is an approximation to a telos that remains unattained (e.g. *rise*); neither type, however, absolutely excludes the dispreferred interpretation. These verbs can therefore be regarded as telic, but to a lesser extent than verbs of change of location<sup>11</sup> (cf. Bertinetto 1997:160): the eventual state of the entity undergoing the process described by the verb can be inferred to varying degrees but it is not explicitly encoded (see Lieber and Baayen's notion (1997) of INFERRABLE EVENTUAL POSITION OR STATE). The absence of encoded delimitedness is evidenced by the compatibility of many change of state verbs with structures that do not contain a 'measure' (in the sense of Tenny 1994). Change of location verbs, in contrast, inherently specify a delimiter that makes them incompatible with these structures.

- (6) a. The wood began to decay.  
 b. The temperature began to rise.  
 c. \*The train began to arrive.  
 d. \*My friend began to leave.

The class of change of state verbs also includes verbs of appearance (*appear, disappear*), and verbs of happening (*happen, occur*). Contra Levin & Rappaport Hovav 1995, these verbs are distinguished here from verbs of simple existence, since they have a transition component in their semantics: both 'appearing' and 'happening', in fact, imply that an entity or event comes into existence.

In Italian, most verbs of indefinite change and of appearance and happening select *essere*, as indicated in 7. But native speakers' intuitions are less determinate than with change of location verbs: *avere* with these verbs is not categorically rejected.

- (7) a. La temperatura è salita/ ?\*ha salito improvvisamente  
 the temperature is risen/ has risen suddenly  
 'The temperature suddenly rose.'  
 b. Le mele sono marcite/ ?hanno marcito al sole  
 the apples are rotted/ have rotted in the sun  
 'The apples rotted in the sun.'

(Similarly: *crescere* 'grow', *apparire* 'appear' and others).

A small number of verbs in this class display variable behavior, as in 8.

- (8) a. La pianta è / ha fiorito due volte quest'anno  
 the plant is / has blossomed twice this year  
 'The plant blossomed twice this year.'

The syntactic behavior of this class is less consistent in other languages. Inherently telic verbs *die* and *be born* are the most invariant in selecting BE, which again supports the view that telicity is a direct determinant of BE selection.

- (9) a. Ma fille est née a cinq heures du matin (French)  
 My daughter is born at five hours of morning  
 'My daughter was born at five o'clock in the morning.'

<sup>11</sup> See Bertinetto and Squartini (1995: 13–14): 'John has enlarged the hole has two possible meanings: [the attainment of a further stage or the attainment of the final goal] . . . one might suggest that only the latter meaning is actually telic, while the former is not, but this is not so. In either sense, the telicity of the situation is satisfied . . . The only difference lies in the different degree attained: the final goal or an intermediate stage'. See also McClure 1995 and Hay et al. 1999 on the gradient structure of telicity in these verbs.

- b. De leraar is plotseling gestorven (Dutch)  
 the teacher is suddenly died  
 'The teacher suddenly died.'
- c. Die Zwillinge sind im April geboren (German)  
 the twins are in April born  
 'The twins were born in April.'

Verbs of indefinite change and appearance/happening normally select *BE* in Dutch and German:

- (10) a. Haar baby is / \*heeft deze maand enorm gegroeid (Dutch)  
 her baby is / has this month enormous grown  
 'Her baby has grown enormously this month.'
- b. Der Rauch ist in die Höhe gestiegen  
 the smoke is in the height risen  
 'The smoke rose.'

(Other verbs displaying similar behavior include Dutch *verschijnen* 'appear', *stijgen* 'rise'; German *passieren* 'happen', *ershienen* 'appear').

These verbs however, are sensitive to temporal modifiers that detelicize the predicate and thus induce an interpretation in which the final goal of the event has not been reached. Such detelicized predicates may optionally display auxiliary alternations in Dutch, as indicated in example 11 from van Hout (1993:7).

- (11) De temperatuur is / heeft 3 uurlang gestegen, maar is toen weer gezakt.  
 The temperature is / has 3 hours risen, but is then again dropped  
 'The temperature rose for three hours but then dropped again.'

These verbs are ambiguous between a telic and an atelic reading: although the telic meaning is the most natural, they readily allow an atelic interpretation, which triggers the selection of *hebben*.

The class of change of state verbs is variable in French. Among the verbs that consistently select *être* one finds, besides *mourir* 'die' and *naître* 'be born', both *devenir* 'become' and *décéder* 'die/pass away', which are inherently telic.

- (12) L'enfant est / \*a devenu triste  
 the child is/ has become sad  
 'The child became sad.'

Verbs denoting indefinite change of state normally select *avoir*, unlike their Italian or Dutch counterparts, regardless of whether the telos of the event is overtly expressed or only inferrable. This is shown in 13.

- (13) Marie a rougi de honte  
 Marie has blushed of shame  
 'Marie blushed because she was ashamed.'

(Similarly, *grandir* 'grow up', *croître* 'grow', among others)

A number of verbs display variable behavior: for example, *échoir*, *paraître*, *disparaître*, *passer*, *monter*, *demeurer*, *échapper* (Grevisse 1993). Even for these verbs, however, variability is governed by semantic regularities, and particularly by telicity. According to Grevisse, *échapper* selects *être* when it refers to something said or done inadvertently (change of state, as in 14b), but *avoir* when it means 'being elusive' (continuous process, as in 14c).



- (14) a. Le livre est / a paru récemment  
 the book is / has appeared recently  
 'The book recently appeared.'
- b. La cause de ce phénomène a jusqu'à présent échappé à toutes  
 the cause of this phenomenon has up to now escaped to all  
 les recherches  
 the investigations  
 'The cause of this phenomenon has so far escaped all investigations.'
- c. Son secret lui est échappé  
 his secret to-him is escaped  
 'His secret escaped him.'

To sum up, the class of verbs of change of state includes verbs that encode telicity to variable degrees. Most verbs in this class are characterized by inferrable, rather than overtly expressed, telicity. Compared to verbs of change of location, these verbs exhibit more variation both within individual languages and across languages. Moreover, they show a greater sensitivity to features contributed by the predicate or by the construction in which they appear. Native speakers' intuitions about auxiliary selection is less determined than with verbs of change of location: although BE is the preferred auxiliary, HAVE is not categorically rejected with many of these verbs.<sup>12</sup>

**3.3. CONTINUATION OF CONDITION VERBS.** The next two classes along the hierarchy consist of verbs that are commonly put together in the single class of statives. All these verbs are nondynamic, but are stative to different degrees. The first class is that of verbs denoting the continuation of a preexisting condition (e.g. *stay, remain, last, survive*). Although less dynamic than verbs of change of location/condition, these verbs still have an implicit change component in their semantics, and thus entail an implicit state (see Dahl 1987, Lieber & Baayen 1997, Cummins 1996): specifically, they entail the negation of change, in that remaining implies 'not leaving.' Like many verbs of indefinite change, continuation-of-condition verbs thus imply an inferrable state, which is however not the final stage of the event, but rather the implicit point of departure of the action whose continuation is described.

While continuation of condition verbs tend to select *essere* in Italian, auxiliary alternations are not uncommon, even though many are nonstandard, as in 15.<sup>13</sup>

- (15) a. Ancora una volta sono / ?ho rimasto solo  
 again one time am / have remained alone  
 'Once again I remained alone.'
- b. La guerra è / ?ha durato a lungo  
 the war is / has lasted for long  
 'The war lasted a long time.'

<sup>12</sup> A referee comments that the notion of 'verb class' is useful only insofar as all verbs belonging to the same class behave in the same way. But the point of this article is precisely that variation is exhibited to different degrees by different verb classes: the extent of variation is minimal with some verbs and progressively greater with other verbs, depending on their aspectual and thematic nature.

<sup>13</sup> A referee disagrees with several of the judgments expressed in the examples in 15—and with other examples of auxiliary choice with Italian noncore verbs—and also objects that it is not clear which language the paper is referring to, given that standard and nonstandard examples are both cited. Disagreement is exactly what my analysis predicts for noncore verbs. As for mixing examples from standard Italian with nonstandard examples, I regard it as legitimate to the extent that (a) nonstandard cases often are the precursors of change and (b) nonstandard uses are significantly more common with noncore verbs than with core verbs, a fact that is also predicted by my analysis.

- c. Il presidente è / ha durato in carica due anni  
 the president is / has lasted in post two years  
 'The president lasted in post for two years.'

(Similarly: *sopravvivere* 'survive', *persistere* 'persist').

The contrasts in 15 show that verbs denoting continuation of state—unlike verbs of change of location or condition—are sensitive to the agentivity of the subject: agentive subjects make the use of auxiliary *avere* more acceptable, as in 15c.

Verbs of continuation of state tend to select *avoir* in French, but show inconsistency both in Dutch and in German.

- (16) Mes parents \*sont survécus / ont survécu au (French)  
 my parents are survived / have survived to  
 tremblement de terre  
 the earthquake  
 'My parents survived the earthquake.'
- (17) a. Die Äpfel haben / \*?sein den ganzen Winter gehalten (German)  
 the apples have the whole winter lasted  
 'The apples lasted the whole winter.'
- b. Der Wanderer hat / ??ist kurz verweilt  
 the hiker has / is briefly stayed
- (18) a. Slechts één kandidaat is uiteindelijk overgebleven (Dutch)  
 only one candidate is finally remained  
 'Only one candidate remained in the end.'
- b. Het concert heeft/ ??is een hele tijd geduurd (Dutch)  
 the concert has a whole time lasted  
 'The concert lasted a long time.'

The verb *remain* represents a significant exception, in that it selects BE across languages, as in the examples in 19.

- (19) a. Marie est restée / \*a resté à la maison avec (French)  
 Marie is remained / has remained at the house with  
 les enfants  
 the children  
 'Marie stayed at home with the children.'
- b. De onverwachte gast is / \*heeft voor het eten gebleven (Dutch)  
 the unexpected guest is / has for the meal remained  
 'The unexpected guest stayed for a meal.'
- c. Die Gäste sind / \*haben am Tisch sitzen geblieben (German)  
 the guests are / have at the table seated remained  
 'The guests remained seated at the table.'

*Remain* implicitly denotes an inferrable state. As Lieber and Baayen noted, 'Unlike verbs predicating pure location, *blijven* invites a non-trivial inference about the eventual state or location of its highest argument, namely wherever it started.' This is precisely the feature that characterizes the class of verbs of continuation of state, of which *remain* is the most concrete example.<sup>14</sup>

<sup>14</sup> As Dahl points out, *remain* can be regarded as intermediate between location and direction: 'Whether we want to regard it as expressing direction or location depends on how we delineate *direction*. We may define it as "the final point of a movement"; in that case, the place at which something remains is excluded. On the other hand, we might choose to define it as "the point at which something is located as the result of what is said to take place in the sentence."' (1987:153). See also Cummins 1996 for a discussion of *rester* in French.

**3.4. EXISTENCE OF STATE VERBS.** Stative verbs occupy the most variable position on the hierarchy. In contrast with continuation of condition verbs, which incorporate the negation of change in their semantics, verbs denoting simple existence imply no change component at all. This class includes verbs referring to concrete states (*be, exist, belong*), positional verbs in their 'simple position' meaning: *sit, lie*, etc., and verbs denoting abstract or psychological states (*seem, suffice, please*).<sup>15</sup> These verbs are neither externally nor internally caused: the notion of causation is simply irrelevant.

Stative verbs have a preference for *essere* in Italian, as shown by the auxiliary selection in 20, but native intuitions are considerably weaker on these verbs. As in the case of continuation-of-state verbs, auxiliary alternations are well attested (Serianni 1989, Lepschy & Lepschy 1988, Rohlf's 1969). Some examples are given in 21.

- (20) a. I dinosauri sono esistiti / ??hanno esistito 65 milioni di anni fa.  
 the dinosaurs are existed / have existed 65 millions of years ago  
 'The dinosaurs existed 65 million years ago.'
- b. La farina non è bastata / ??ha bastato per fare la torta.  
 the flour not is lasted has lasted to make the cake  
 'There wasn't enough flour to make the cake.'
- c. La commedia è sembrata / ??ha sembrato interessante a tutti  
 the play is seemed has seemed interesting to all  
 'The play seemed interesting to everyone.'
- (21) a. Una lunghissima vita avrebbe appena bastato ad appagare il  
 a very long life would have just sufficed to satisfy  
 mio cuore.  
 my heart  
 'A very long life would have just sufficed to satisfy my heart.'
- b. La vita ha appartenuto solo a me.  
 the life has belonged only to me  
 'My life belonged only to me.'
- c. Il cibo è / ha scarseggiato tra i terremotati.  
 the food is / has run short supply among the earthquake victims  
 'The food ran short supply among the earthquake victims.'

(Similarly: *sussistere* 'subsist', *servire* 'be useful', *corrispondere* 'correspond'.)

In French, verbs of existence consistently select auxiliary *avoir*. In German, the majority select *haben* but some exhibit variation, as can be seen in the examples in 23, which include verbs of spatial configuration.<sup>16</sup>

- (22) Le dinosaures ont existé /\*?sont existé il y a 65 millions (French)  
 the dinosaurs have existed there is 65 million  
 d'ans.  
 of years  
 'The dinosaurs existed 65 million years ago.'
- (23) a. Das Buch hat mir gefallen. (German)  
 the book has to-me pleased  
 'I liked the book.'

<sup>15</sup> This category may appear heterogeneous because it includes verbs denoting both physical and psychological states. In this respect, a reviewer wonders why verbs such as *corrispondere* are classified as verbs of existence. This verb is inherently stative and receives the same classification in Levin 1993.

<sup>16</sup> According to Levin and Rappaport Hovav (1995), verbs of spatial configuration can have three meanings: (a) assume position, which refers to a volitional coming to be in a particular position, as in *Bob sat down after the President's speech*; (b) maintain position, which involves the deliberate maintenance of a particular

- b. Das hat mir genügt.  
this has to-me sufficed  
'This was enough for me.'
- c. Das Buch ist/hat auf dem Boden gelegen.  
the book is/has on the floor lain  
'The book was lying on the floor.'
- d. Ich bin/habe von ihr abgehängt.  
I am/have from her depended  
'I depended on her.'

Verbs showing similar behavior include *bestehen* 'consist of', *gehören* 'belong'.

Dutch exhibits some limited variation in auxiliary selection within this verb class: while most verbs of position (24a) and existence (24b) select *hebben*, *blijken* 'seem' selects the auxiliary *zijn* (24c).

- (24) a. Het beeldje heeft op de tafel gestaan.  
the picture has on the table stood  
'The picture stood on the table.'
- b. Het magische zwaard heeft echt bestaan.  
the magic sword has really existed  
'The magic sword really existed.'
- c. Sofie is een goede docente gebleken.  
Sofie is a good teacher seemed  
'Sofie seemed a good teacher.'

Verbs behaving similarly include *zitten* 'sit' and *horen* 'belong'.

For Dutch and German, the exception is the verb BE itself, although Lieber and Baayen (1997:815) point out that there is regional variation in Dutch with respect to auxiliary choice with *zijn*.

- (25) a. Peter ist lange Zeit in Ausland gewesen. (German)  
Peter is long time in abroad been  
'Peter was abroad for a long time'
- b. Anne is deze winter in Australië geweest. (Dutch)  
Anne is this winter in Australia been  
'Anne was in Australia last winter.'

To summarize, we have seen that there is a hierarchy among verbs denoting transition and state, which ranges from verbs of change of location, which express telicity inherently and overtly, to verbs that imply an eventual end-state of the change process, to verbs that include an implicit negation of change, finally to verbs that denote simple existence of a state. The order of these verb classes on the hierarchy reflects their decreasing degree of aspectual specification (from strongly telic to stative). The degree of variation exhibited by these verbs—both intra- and interlinguistically—increases as a function of their position along the hierarchy, and is minimal for change-of-location verbs and more prominent for verbs of continuation and existence of state. The closer a verb is to the stative end of the hierarchy, the more aspectually underspecified it is, and the more variation it displays. Languages vary, but in an orderly way.<sup>17</sup>

spatial configuration, as in *Bob sat still for the whole length of the concert*; and (c) simple position, which describes the location of an entity, as in *The book lay open on my desk*. The first two meanings are agentive, while the third is usually predicated of inanimate subjects. Within the framework developed here, these three types of spatial configuration verbs belong to three distinct classes: change-of-state, continuation-of-state, and existence-of-state, respectively.

<sup>17</sup> A referee objects that auxiliary selection in French, Dutch and German does not show gradience, since there are no clear differences between continuation-of-condition verbs and existence-of-state verbs. The

**3.5. ANTICAUSATIVE VERBS.**<sup>18</sup> My analysis thus far has focused on monadic verbs. The status of intransitive verbs with a transitive alternant (anticausatives) is more controversial. Native speakers of Italian have less clear intuitions about these verbs, and their preference for *essere* is relatively weak (Sorace 1992, Bard et al. 1996). Semantically, these verbs have been characterized as denoting externally caused events, for which the causer has been suppressed but is still there at the level of lexical semantic representation (cf. Levin & Rappaport Hovav 1995, Pustejovsky & Busa 1995, also Chierchia 1989). I will examine evidence from various languages indicating that such verbs are inconsistent in auxiliary selection.

For French, Labelle (1990, 1992) argues that there is a crucial difference in French between change-of-state verbs that can occur only in the nonreflexive intransitive form (as in 26a, b), and verbs that occur in the reflexive intransitive form (as in 26c,d): while reflexive intransitives select *être*, nonreflexive intransitives select *avoir*, as illustrated by 26d, b.<sup>19</sup>

- (26) a. La neige fond / \*se fond. (only nonreflexive possible)  
 the snow melt / REFL-melt  
 'The snow melts.'
- b. La neige a fondu / \*est fondue.  
 the snow has melted / is melted  
 'The snow melted.'
- c. Le vase se brise / \*brise. (only reflexive possible)  
 the vase REFL-break / break  
 'The vase breaks.'
- d. Le vase s'est brisé / \*a brisé.  
 the vase REFL-is broken / has broken  
 'The vase broke.'

A subset of change-of-state verbs enter into both constructions, as in 27.

- (27) a. La cire se ramollit / ramollit.  
 the wax REFL-soften / soften  
 'The wax softens.'
- b. La cire s'est ramollie / a ramollie.  
 the wax REFL-is softened / has softened  
 'The wax softened.'

Similar verbs are *casser/se casser* 'break', *gonfler/se gonfler* 'inflate', *rétrécir/se rétrécir* 'get narrower'.

gradient analysis, however, does not predict that all languages distinguish among all classes on the hierarchy. It is possible for languages to combine classes, or perhaps to make finer differentiations within classes. The central prediction of gradient analysis is that there will be more variation among intermediate verbs, and this is indeed shown by the data (see §6 on typological implications).

<sup>18</sup> The term ANTICAUSATIVE is used here to refer to the fact that, at least in the languages examined in this article, these verbs are assumed to be derived from a more basic transitive counterpart. This is the analysis offered by Levin and Rappaport Hovav (1995): the reader is referred to their work for arguments supporting 'detransitivization'. Anticausativization is by no mean the most productive pattern in wider typological terms. Other patterns, such as causativization (where the intransitive is basic and the transitive is derived) or equipollent alternation (where neither of the two members is basic), are equally widespread (see Haspelmath 1993).

<sup>19</sup> Labelle points out that these verbs fail other recognized syntactic diagnostics of unaccusativity, such as *en*-cliticization, embedded infinitival relatives, and adjectival passives. The anomalous behavior of nonreflexive anticausatives is also recognized by Zubizarreta (1987:90), who accounts for it by means of a marked linking rule specified in their lexical representation.

The question is whether there is a semantic basis for the reflexive vs. nonreflexive split. On the one hand, the alternation is related to whether the event denoted by the verb can be construed as internally caused: if it can (as in the case of *fondre*), the intransitive construction is the only one possible. On the other hand, the reflexive/nonreflexive alternation seems to be related to whether the focus is on the final state attained by the argument of the verb, or on the process that may or may not lead to that final state. So in 27a, b, intransitive *ramollir* is a verb of indefinite change, implying that the wax has softened but it may or may not be soft as a result, and is thus less telic than reflexive *se ramollir*, which implies that the wax has actually softened to the point of becoming soft. This further supports the conclusion that in French, unlike Italian and Dutch, an *inferrable* eventual state is not a sufficient condition for BE selection: the end-state has to be explicitly encoded in the lexical-semantic representation of a verb. As already stated, explicit telicity is the main determinant of *être*-selection in French.<sup>20</sup>

In Italian, as in French, anticausatives split into two subclasses: verbs in nonreflexive form, as in 28a, tend to denote indefinite change, without the necessary attainment of a final state, whereas verbs in reflexive form, 28b, tend to suggest a telic interpretation.<sup>21</sup>

- (28) a. *annerire* 'blacken', *umentare* 'increase', *avanzare* 'advance', *continuare* 'continue', *diminuire* 'decrease', *ingrassare* 'become fat', *ispessire* 'become thick', *migliorare* 'improve', *peggiore* 'worsen', *sprofondare* 'sink'
- b. *accumularsi* 'accumulate', *allargarsi* 'widen', *attorcigliarsi* 'twine', *capovolgarsi* 'capsize', *concentrarsi* 'concentrate', *dividersi* 'divide', *liquefarsi* 'liquify', *muoversi* 'move', *riempirsi* 'fill', *rovesciarsi* 'spill', *sporcarsi* 'get dirty', *stancarsi* 'get tired', *svilupparsi* 'develop'

As in French, some Italian anticausative verbs can have both a reflexive and a nonreflexive form, showing similar aspectual differences to the ones described for the French verbs in 27. The following examples from Arad 1998b illustrate the contrast: 29a has a telic interpretation, whereas 29b denotes a process.

- (29) a. Le camicie si sono asciugate al sole.  
the shirts REFL-are dried in the sun  
'The shirts dried in the sun.'
- b. Le camicie hanno asciugato al sole.  
the shirts have dried in the sun  
'The shirts dried in the sun.'

<sup>20</sup> Cummins (1996) argues that in some cases (e.g., *aller* 'go') a telic reading is induced by the use of the perfective tense.

<sup>21</sup> A referee finds the lists in 28 'impressionistic' and asks whether there are any statistical criteria to motivate the suggested semantic distinction between reflexive and nonreflexive anticausative verbs. Two comments are in order here. The first is that, desirable as a quantitative criterion might be, linguistic analyses can (and should continue to) be developed regardless of its availability. The second is that much of the classification I propose here has actually been subjected to experimental testing involving the objective measurement of speakers' preferences for one auxiliary over the other: it is therefore much less impressionistic than most examples found in the linguistic literature.

The same referee objects that the verb *diminuire* 'decrease' is telic in a sentence such as *Il prezzo è diminuito* 'The price has decreased'. The point is that *diminuire* has a PREFERRED interpretation in which the focus is on a comparison between two stages of the same event, rather than on the endstate of the event; but the telic interpretation is not ruled out and may be favored in certain contexts. Similarly, the preferred interpretation of the verbs in 28b focuses on the attainment of the endstate; the other interpretation is less likely, but still available.

Nonreflexive anticausatives are morphologically identical to their transitive counterparts and, unlike their French equivalents, take auxiliary BE, though native speakers find them less unacceptable than monadic intransitives when they are presented with auxiliary *avere*, as shown by the stronger ungrammaticality of 30a compared to 30b.

- (30) a. \*I bambini hanno arrivato.  
           the children have arrived  
       b. ?Il tempo ha migliorato.  
           the weather has improved

In Dutch and German, unlike in the other languages examined so far, many anticausatives are morphologically different from their transitive counterparts. Examples of such pairs of alternating verbs are given in 31a,b for Dutch and 31c,d for German.

- (31) a. *zinken* 'sink' (intransitive) vs. *afzinken* 'sink' (transitive)  
       b. *schrikken* 'become frightened' (intransitive) vs. *afschrikken* 'scare away' (transitive)  
       c. *ertrinken* 'drown' (intransitive) vs. *ertränken* 'drown' (transitive)  
       d. *zerspringen* 'blow up' (intransitive) vs. *zersprengen* 'blow up' (transitive).

The exceptions, that is, the verbs that maintain the same form in both their transitive and intransitive variants, are few in number, or otherwise infrequent and/or restricted in register. For example, only a small group of common Dutch verbs display morphological identity: among them, *bederven* 'spoil', *breken* 'break', *genezen* 'heal', *ontdooien* 'thaw', *smelten* 'melt', *veranderen* 'change' (see Donaldson 1981; for an almost exhaustive list of such verbs, including the infrequent ones, see Lieber & Baayen 1997). Notice that the past participles of these verbs in their intransitive version tend to assume an adjectival meaning.

- (32) a. De kip is ontdooid.  
           the chicken is thawed  
       b. De boter is gesmolten.  
           the butter is melted

There seems to be evidence that the languages examined here do not easily tolerate transitive-anticausative alternations in pairs where both variants are morphologically identical. The intransitive member of the alternation has unstable valence. There is therefore a tendency for it to lose its verbal meaning, or to be syntactically assimilated to its transitive counterpart.<sup>22</sup> It seems that the presence of an external cause in the lexical representation of these verbs weakens their preference for BE. Although these verbs denote a change of state, and are therefore telic, they are different from monadic verbs of transition for which the notion of causation is syntactically irrelevant.<sup>23</sup>

<sup>22</sup> Evidence for this 'analogical leveling' is found in Canadian French, where the expansion of *avoir* at the expense of *être* is more advanced than in European French: verbs such as *rentrer*, *tomber*, *partir*, *rester*, which can be used transitively in Canadian French, are often employed with *avoir* (Canale et al. 1978, Sankoff & Thibault 1977).

<sup>23</sup> Haegeman (1994: 335) reaches conclusions similar to Labelle's for English anticausative verbs, arguing that these verbs are unergatives ('intransitive' in her terminology) which project their theme argument onto the subject position at d-structure. Further evidence of the different status of anticausative verbs is found in Sardinian (Jones 1993:107), where these verbs take *àere* ('have') and not *éssere* ('be'):

- (i) Sa linna at brujadu/ \*est brujada  
       the wood has is burned  
       (ii) S'abba at buddidu/ \*est buddida  
           the water has/ is boiled

Jones, like Labelle, concludes that anticausative verbs are not unaccusative.

#### 4. PROCESSES.

**4.1. CONTROLLED, NONMOTIONAL, UNAFFECTING PROCESSES.** The most determined among process verbs are those denoting nonmotional, normally agentive processes (*work, play, talk*) which do not manifestly affect the entity in control of them, and which are nonhomogeneous in terms of aspectual structure. These verbs consistently select HAVE in many languages, as the sentences in 33 illustrate.

- (33) a. I colleghi hanno chiaccherato tutto il pomeriggio. (Italian)  
 the colleagues have chatted whole the afternoon  
 'My colleagues chatted the whole afternoon.'
- b. Les policiers ont travaillé toute la nuit. (French)  
 the policemen have worked whole the night  
 'The policemen worked all night.'
- c. De trompettist heeft met bolle wangen geblazen. (Dutch)  
 the trumpeter has with puffed-out cheeks blown  
 'The trumpeter blew with puffed-out cheeks.'
- d. Kurt hat den ganzen Sonntag gearbeitet. (German)  
 Kurt has the whole Sunday worked  
 'Kurt worked all day Sunday.'

These verbs are agentive in their primary meaning but can take nonagentive subjects. While the lack of agentivity has no effect on the standard auxiliary, some native speakers of Italian find auxiliary *essere* not completely unacceptable when the subject is non-agentive, as in 34.

- (34) Il cibo inviato dall'ONU ha funzionato / ?è funzionato solo come  
 the food sent by the UN has functioned / is functioned only as  
 palliativo.  
 palliative  
 'The food sent by the UN worked only as a palliative.'

The auxiliary choice of nonmotional activity verbs as unergative is also insensitive to the telicization of the predicate by an adverbial phrase that temporally bounds the event, as in 35. Like the verbs of change of location, these verbs are thus unaffected by the characteristic of the predicate.

- (35) I poliziotti hanno lavorato fino all'alba.  
 the policemen have worked until the dawn  
 'The policemen worked until dawn.'

In sum, verbs denoting controlled, unaffected, nonmotional processes categorically select HAVE, as shown by their consistent syntactic behavior across languages. These are the verbs that Grimshaw (1990) describes as 'maximally prominent' because they exhibit perfect alignment between the thematic and the aspectual dimensions.

**4.2. CONTROLLED, AFFECTING PROCESSES.** An interesting subclass in Italian is verbs denoting volitional actions that imply a permanent change of state for the subject argument, such as *abdicare* 'abdicate', *aderire* 'join in', *cedere* 'yield', *trionfare* 'triumph' (see McClure 1995, who defines these verbs as 'unergative achievements').

The key to solving the apparent puzzle posed by these verbs is to consider the strong agentivity and affectedness of their subject argument. In their primary meaning, these verbs imply deliberate intentionality on the part of the subject; they also represent a resulting abstract change of state (if I abdicate, I am no longer in power) which cannot however be interpreted as the telic point of the action, but only as its logical conse-



quence. Some of these verbs can appear with a nonhuman subject: when they do, they tend to be also acceptable with the BE auxiliary, thus displaying the familiar sensitivity to agentivity (see 36b).

- (36) a. Maria ha / \*è ceduta alle tue insistenze  
 Maria has / is yielded to your pressure  
 'Maria yielded to your pressure.'  
 b. Il pavimento ha / ?è ceduto all'improvviso  
 the floor has / is yielded suddenly  
 'The floor suddenly yielded.'

*Aderire* 'join', 'adhere', *trionfare* 'triumph', *prevalere* 'prevail' behave similarly. These data suggest that these verbs, which denote processes both controlled and affecting, select HAVE less categorically than verbs of controlled, unaffecting processes.

**4.3. CONTROLLED, MOTIONAL PROCESSES.** Verbs of manner of motion imply a nondirected displacement of their single argument. Their subject is affected to a higher degree than the subject of nonmotional activities, since it often is both a volitional initiator of the event and an experiencer of the undirected change of location denoted by it. The aspectual structure of verbs in this class is more homogeneous than that of nonmotional processes. Swimming, for example, consists of a series of strokes which are individually different from each other, but become indistinguishable when considered in sets (McClure 1995:37).

Verbs in this group normally select HAVE in Italian, Dutch and French, although the intuitions of native speakers are less categorical than on verbs of nonmotional process.

- (37) a. Gli atleti svedesi hanno corso / ?sono corsi alle Olimpiadi (Italian)  
 the athletes swedish have run / are run at.the Olympics  
 'The Swedish athletes ran at the Olympic Games.'  
 b. De zwerver heeft / ?is overal gelopen (Dutch)  
 the vagabond has / is overall run  
 'The vagabond ran all over the place.'  
 c. Marie a nagé / ?est nagée tout l'après-midi (French)  
 Marie has swum / is swum all the afternoon  
 'Marie swam the whole afternoon.'

In contrast, many of these verbs select *sein* in German.

- (38) Uschi \*hat / ist den ganzen Tag gerannt/ gelaufen/ geschwommen  
 Uschi has is the whole day run/ walked/ swum  
 'Uschi ran/walked/swam the whole afternoon.'

A well-known characteristic of these verbs is their sensitivity to features that telicize the predicate. Dutch is the most systematic language in this respect: all manner-of-motion verbs switch from *hebben* to *zijn* when they are embedded in a predicate that has been telicized by a directional phrase (see 39). But in Italian only a small subset of manner-of-motion verbs regularly shift auxiliary: *correre* 'run' participates in the shift but *nuotare* 'swim' does not (as in 41), even though native speakers' preference for *avere* are not categorical.<sup>24</sup> In French, event-type shifts are not marked by a corresponding auxiliary shift, as in 42b, where the auxiliary remains *avoir*.

<sup>24</sup> A referee finds *essere*, as well as *avere*, acceptable with the Italian verb *rotolare* 'roll' as in *Mario è rotolato/ha rotolato per evitare l'auto* 'Mario rolled to avoid the car'. This example clearly confirms the indeterminacy of these verbs, particularly in the absence of a PP that overtly expresses telicity.

- (39) a. De bal heeft / \*is gerold (Dutch)  
 the ball has / is rolled  
 'The ball rolled.'  
 b. De bal is/\*heeft naar beneden gerold  
 the ball is/ has to down rolled  
 'The ball rolled downstairs.'
- (40) a. Hans und Rita haben/\*sind im Saal getanzt (German)  
 Hans and Rita have/ are in the hall danced  
 'Hans and Rita danced in the hall.'  
 b. Hans und Rita sind/\*haben in den Saal getanzt  
 Hans and Rita are/ have into the hall danced  
 'Hans and Rita danced into the hall.'
- (41) a. Maria ha corso/è corsa velocemente. (Italian)  
 Maria has run/is run fast  
 'Maria ran fast.'  
 b. Maria è corsa/\*ha corso in farmacia  
 Maria is run / has run to the pharmacy  
 'Maria ran to the pharmacy.'  
 c. Paola ha nuotato/\*è nuotata con perfetto stile  
 Paola has swum/ is swum with perfect style  
 'Paola swam with perfect style.'  
 d. Paola ha nuotato/\*è nuotata a riva  
 Paola has swum/ is swum to the shore  
 'Paola swam to the shore.'
- (42) a. Marie a couru/\*est courue tres vite (French)  
 Marie has run/ is run very fast  
 'Marie ran very fast.'  
 b. Marie a couru/\*est courue jusqu'à la maison  
 Marie has run/ is run as far as the house  
 'Marie ran home.'

A sensitivity to the agentivity of the subject is significantly exhibited by these verbs in Italian. When they have a nonagentive meaning, as in the idiomatic expression in 43a or are used with a sentential subject, as in 43b, the preferred auxiliary is *essere*.

- (43) a. È corsa/?ha corso voce che Maria si sposa  
 is run/ has run rumor that Maria self-marries  
 'The rumor spread that Maria is getting married.'  
 b. È saltato fuori/?ha saltato fuori che i magistrati erano  
 is jumped out/ has jumped out that the magistrates were  
 corrotti  
 corrupted  
 'It turned out that the magistrates were corrupted.'

Furthermore, the same verb prefers one or the other auxiliary according to the extent to which the subject is a volitional controller:

- (44) a. Il pilota ha/?è atterrato sulla pista di emergenza  
 the pilot has/is landed on the runway of emergency  
 'The pilot landed on the emergency runway.'  
 b. L'aereo è/?ha atterrato sulla pista di emergenza  
 the plane is/has landed on the runway of emergency  
 'The plane landed on the emergency runway.'

To summarize: in contrast to verbs denoting controlled, nonmotional processes, verbs of manner of motion are more variable crosslinguistically and syntactically more sensitive to aspectual changes of the predicate in which they appear.

**4.4. UNCONTROLLED PROCESSES.** While both the previous classes consist of predominantly agentive activity verbs (some of which can have nonagentive uses), the next class includes verbs denoting various types of process, such as uncontrolled action, involuntary bodily function, and emission (of substance/light/sound/smell), whose common denominator is the lack of volitionality. This class also includes weather verbs, which are the quintessential example of impersonal process (see Ruwet 1991). Verbs in this class denote 'stative', nondynamic activities, which require a low degree of volitional energy to be performed, have more density and more homogeneity than verbs in the two previous groups, and are characterized by a high degree of subject affectedness (for example, an *emitter* is totally defined by the emission process). Verbs of nonvolitional process show a marked sensitivity to the animacy of the subject: although many can be used with both human and inanimate subjects, they prefer HAVE with agentive subjects, as exemplified by the greater unacceptability of auxiliary *essere* in the Italian example 45b compared to 45a.

- (45) a. La fede religiosa ha tentennato/??è tentennata anche nei più forti  
 the faith religious has wavered/is wavered even in the strongest  
 'The religious faith wavered even in the strongest people.'
- b. Paolo ha tentennato/\*è tentennato a lungo prima di decidersi  
 Paolo has wavered/is wavered for long before of decide-self  
 'Paolo wavered for a long time before he made up his mind.'

*Tremare* 'tremble', *inorridire* 'be horrified', *rabbrivire* 'shiver', *attaccare* 'catch on', *scarseggiare* 'run in short supply', *sbandare* 'skid' are similar verbs.

Further evidence for the effect of agentivity on this verb group comes from verbs denoting involuntary bodily functions/reactions (*cough*, *sweat*, *sneeze*, *vomit*), which normally have a human, nonagentive, affected subject and tend to select *avere* more strongly than do verbs of uncontrolled action. These verbs can be construed as implying volitionality more easily than verbs of uncontrolled action, as indicated in 46b by the possibility of construing them with the phrase 'on purpose.'<sup>25</sup>

- (46) a. Mario ha/\*è tossito  
 Mario has/is coughed  
 'Mario coughed.'
- b. Mario ha tossito apposta per attirare l'attenzione.  
 Mario has coughed on purpose to attract the attention  
 'Mario coughed on purpose to attract attention.'

Verbs of emission have the lowest degree of agentivity and the highest degree of subject affectedness. They mostly take inanimate subjects, and have the highest degree of density. While these verbs normally select HAVE in French, Dutch and German, their behavior is highly variable in Italian, as shown by the standard and nonstandard (but attested) auxiliary shifts in 47.

- (47) a. Il telefono ha/è squillato.  
 the telephone has/is rung  
 'The telephone rang.'

<sup>25</sup> Verbs in this category are highly variable crosslinguistically (see Rosen 1984:65).

- b. L'eco ha/è risuonato nella caverna  
the echo has/is resounded in the cave  
'The echo resounded in the cave.'
- c. Il tuono ha/è rimbombato  
the thunder has/is rumbled  
'The thunder rumbled.'
- d. La campana ha/?è rintoccata  
the bell has/is tolled  
'The bell tolled.'

Similar verbs are *ticchettare* 'tick', *brillare* 'shine', and *suonare* 'ring'.

Finally, weather verbs display apparent free variation in auxiliary selection in Italian. In many—although not in all—contexts, they appear with either *essere* or *avere*.

- (48) Ieri ha / è piovuto/nevicato/gradinato tutto il giorno  
yesterday has / is rained/snowed/hailed all day  
'Yesterday it rained/snowed/hailed all day.'

There are however, constraints on auxiliary selection (Benincà & Cinque 1991). First, weather verbs must take *essere* when the telic endpoint of the event is overtly expressed as a change of location, for example in the form of a directional phrase.

- (49) Mi e'/\*ha piovuto sulla testa  
to-me is/has rained on the head  
'It rained over my head.'

Second, only a subset of weather verbs freely allows both auxiliaries in the absence of a directional phrase. Other verbs prefer *avere* and are more marginal with *essere*: among these, *tuonare* 'thunder' and *lampeggiare* 'flash', as in 50.

- (50) a. Ha/?è tuonato molto durante il temporale  
has/is-3SG thundered a lot during the storm  
'It thundered a lot during the storm.'
- b. Ha/?è lampeggiato all'improvviso  
has/is-3SG flashed lightning suddenly  
'It flashed lightning suddenly.'

The reason is that only simple weather verbs may be interpreted as verbs denoting the change of location (of a substance), whereas these cannot. But *tuonare* and *lampeggiare* as verbs of sound and light emission, respectively, may allow a 'directional' interpretation of sound in the same way as English verbs of sound emission. Under this interpretation they take *essere*.

- (51) ?Ci è tuonato/lampeggiato sopra  
to-us is thundered/flushed lightning over  
'It thundered/flushed over us.'

Auxiliary selection with process verbs displays similar systematic variation in the four Western European languages under consideration. Auxiliary HAVE is most categorically selected by verbs of nonmotional process, more variable with verbs of motional activity, and least determinate with verbs denoting uncontrolled processes.

5. INTERPRETATIONS. I have shown so far that auxiliary selection displays orderly variation in four Western European languages. What is the most plausible explanation for this fact? An answer to this question largely depends on the status attributed to auxiliaries in a theory of grammar. In principle, it is possible to regard the generalization

expressed in the ASH as an isolated property of auxiliaries, manifested only in these languages. Or one might seek deeper connections between the ASH and other grammatical properties, manifested in a wider range of languages. This is what theories based on the unaccusative hypothesis attempt to do. Since the formulation of the unaccusative hypothesis (e.g. Perlmutter 1978, Burzio 1986), auxiliary selection has been widely regarded as one of the most reliable markers of split intransitivity. It therefore seems appropriate to examine the implications of the ASH for split intransitivity and for theories of the lexicon-syntax interface in general.

**5.1. THE UNACCUSATIVE HYPOTHESIS.** Syntactic analyses in a variety of theoretical frameworks have established that, across languages, intransitive verbs are of two types, unaccusative and unergative, which have distinct syntactic representations. The single argument of an unaccusative verb is syntactically equivalent to the direct object of a transitive verb, whereas the single argument of an unergative verb is syntactically equivalent to the subject of a transitive verb. This configurational distinction is manifested in a number of syntactic properties exhibited by unaccusative verbs, which are also shared by a range of constructions involving operations on an internal argument, such as passives, the cliticization of partitive *ne* in Italian, or the resultative construction in English. The choice of perfective auxiliary in Romance and Germanic languages is also thought to involve a privileged syntactic relation between the subject and the object position and therefore to correlate with other syntactic properties of unaccusativity/unergativity.<sup>26</sup>

The unaccusative hypothesis was originally formulated in the context of the universal alignment hypothesis (Perlmutter 1978) and later within the UTAH (Baker 1988, 1997), which maintained that the unaccusative/unergative distinction is systematically related to certain semantic characteristics of the predicate and that, most generally, agent arguments are 'aligned' with syntactic subjects and theme/patient subjects are aligned with syntactic objects. 'Agenthood' was therefore expected to correlate with unergativity, and 'patienthood' with unaccusativity. This correlation, however, has been observed to break down in a significant number of cases (see Rosen 1984 for much-quoted examples): there often is a lack of correspondence between the semantic component postulated for a verb and the choice of auxiliary that might be predicted on the basis of those components. Moreover, verbs cross-classify in complex ways: as the data in this article show, verbs with similar meaning within and across languages often select different auxiliaries (e.g. *disappear*), and the same verbs within a language often seem to allow both auxiliaries (e.g. *run*). While the existence of multiple unaccusative mismatches has led some researchers to abandon the attempt to characterize split intransitivity semantically (Perlmutter 1989, for example) and some to deny the existence of a syntactic encoding of the distinction (van Valin 1990, Dowty 1991, Lieber & Baayen 1997), others have chosen to focus on the nature of syntax/semantics mismatches, maintaining both levels of representation and investigating the interface between the two. This is the research directly relevant to the data presented here.

While it might be tempting, in fact, to regard the ASH as evidence for purely semantic underpinnings of auxiliary selection (and thus in favor of theories such as van Valin 1990 and Dowty 1991), the correlations among different reflexes of the unaccusative-unergative distinction support Levin and Rappaport's position that the distinction is

<sup>26</sup> As originally noted by Grimshaw (1987), the structural distinction underlying the choice of auxiliaries is less transparent than for other diagnostics.

semantically determined and syntactically encoded. As a number of researchers, including Grimshaw (1990) and Baker (1997), have pointed out, a purely semantic explanation of the contrasts between the two intransitive verb types may be descriptively adequate but does not reach a higher level of generalization; moreover, it fails to explain the compatibility of verb classes with particular constructions. The rest of this article will therefore be concerned exclusively with potential explanations for the ASH that consider auxiliary selection as a phenomenon characterized both in semantic and in syntactic terms.

Within theories of the lexicon-syntax interface, two main perspectives can be distinguished. In the spirit of the unaccusative hypothesis, the well-established lexical or PROJECTIONIST approach maintains that the semantics of a verb deterministically correlates with the syntactic classification of its arguments, and that this in turn produces the syntactic behavior associated with unaccusativity or unergativity (Hale & Keyser 1986, 1993, Levin & Rappaport Hovav 1992, 1994, 1995). This research has highlighted the fact that most mismatches are problematic only to the extent that one expects unaccusatives and unergatives to be homogeneous semantic classes. Since most diagnostics of unaccusativity tend to isolate semantically coherent subsets of verbs, the challenge for a theory of unaccusativity is to single out, among the semantic components of verbs, those that are relevant to the syntax of unaccusativity crosslinguistically, and to explain the principles that govern variation, both within and across languages.<sup>27</sup> Within this approach, variable-behavior verbs have different meanings, and therefore different lexical semantic representations, each with its own regular argument structure realization.

Alternatives to the projectionist views that have gained ground in recent years are the feature-checking or CONSTRUCTIONAL approaches (Borer 1994, 1998, van Hout 1996, 2000, Arad 1998a, McClure 1995, Zaenen 1993). These models consider unaccusativity/unergativity to be a sentence-level property of the predicate, rather than a lexical property of the verb, and maintain that the aspectual interpretations typically associated with unaccusative or unergative verbs are determined by the syntactic configurations in which the verb appears. Since the lexical entry of a verb does not contain any information about the hierarchical ordering of its arguments, any verb is free to enter more than one syntactic configuration and therefore to receive multiple interpretations. The FREE MAPPING position is also adopted by researchers who are not committed to a particular theory of syntactic representation (see e.g., Cummins 1996). What all these models have in common is the assumption that meaning is compositionally, not lexically, determined.

On the assumption that auxiliary selection is indeed a reflex of the syntax of split intransitivity, the variation in the auxiliary selection hierarchy is the ideal ground for testing these alternative hypotheses.

**5.2. THE PROJECTIONIST MODEL.** As an example of the projectionist approach, let us first consider the well-known analysis of unaccusativity in English put forward by Levin and Rappaport Hovav (henceforth L&RH), which is meant to support Perlmutter's original intuition that unaccusativity is semantically determined and syntactically encoded. The three semantic factors that are assumed to be relevant to the syntax of

<sup>27</sup> As argued by Pesetsky (1995), the researcher's null hypothesis should be that the universal alignment hypothesis (UAH) holds, namely that the lexical semantics of a verb and the syntactic expression of its arguments are in a relationship of mutual predictability. If the UAH were invalid, the distribution of unaccusative and unergative verbs would be arbitrary and this would pose a learnability problem, in particular for learners of languages with no clear and robust morphosyntactic markers of the distinction.

split intransitivity are DIRECTED CHANGE, APPEARANCE/EXISTENCE, and IMMEDIATE CAUSATION. The lexical semantic representations of verbs including these semantic components are mapped onto argument structure positions by the following linking rules:<sup>28</sup>

(a) the IMMEDIATE CAUSE LINKING RULE maps the argument that denotes the immediate cause of the eventuality described by that verb onto the position of external argument.

(b) the DIRECTED CHANGE LINKING RULE maps the argument that corresponds to the entity undergoing the directed change described by the verb onto the position of internal argument.

(c) the EXISTENCE LINKING RULE maps the argument of a verb whose existence is asserted or denied onto the direct internal argument.

In languages with a choice of auxiliaries, these rules would predict a correlation between an immediate cause and HAVE, and between directed change or existence and BE, but there are at least three reasons why L&RH's mapping system does not seem to capture the variation expressed by the ASH.

First, it appears that the linking rules are not justified in terms of their crosslinguistic validity. For example, internally caused verbs of change of state and stative verbs are syntactically unergatives in several languages, in which 'directed change' and 'existence' do not map onto internal arguments. On the basis of auxiliary selection, the existence linking rule singles out unaccusative verbs in Italian but not in Dutch, French or German.

Second, the notions of telicity and agentivity, which figure centrally in other accounts of these phenomena, are argued by L&RH to be irrelevant for predicting the classification of verbs as unaccusative or unergative. As for agentivity, L&RH's reasoning is that the notion of 'internal causation' encompasses that of agentivity, since agentive verbs are always internally caused, but internally caused verbs are not necessarily agentive: for example, verbs of emission such as *sparkle* are internally caused but not agentive. But the two notions need to be distinguished to account for the fact that auxiliary selection is most determinate with verbs of nonmotional process and overall least determinate with verbs of uncontrolled process.<sup>29</sup> As for telicity, L&RH once again prefer a broader notion, that of directed change, which encompasses telicity. All telic verbs involve a directed change, but directed change does not necessarily imply telicity: as shown above, degree achievement verbs such as *rise* and *cool* imply an indefinite change in a particular direction but they do not encode the achievement of a final state. Verbs of telic change of location however, have been shown to behave differently from verbs of directed change: only the former consistently select BE, whereas auxiliary choice is variable for the latter. In a language like French, in which most verbs of directed change select *avoir*, the distinction seems to be criterial for auxiliary selection.<sup>30</sup>

<sup>28</sup> L&RH also propose a DEFAULT LINKING RULE, which maps the argument of a verb that does not fall under the scope of any of the other linking rules onto the direct internal argument position.

<sup>29</sup> Furthermore, it is agentivity, not internal causation, which determines the acceptability of the impersonal passive construction in Dutch and German, typically regarded as a test of unergativity (Grewendorf 1989, Hoekstra & Mulder 1990, among others). Although native speakers prefer impersonal passives with agentive unergative verbs, they do not reject unaccusative verbs of inherently directed motion in this construction (Sorace & Vonk 1998).

<sup>30</sup> A referee pointed out that it is controversial whether the selection of auxiliary *être* is a marker of unaccusativity in French. Other syntactic diagnostics of unaccusativity reported in the literature arguably identify a larger class of verbs. Legendre 1989 lists nine tests of unaccusativity, which single out distinct and only partly overlapping subsets of verbs. In her view, a verb is unaccusative if it satisfies at least one of these tests; conversely, a verb is unergative if it fails all the tests. Labelle (1992) discusses, in addition

Third, it is not clear whether implicational relationships or priority rankings obtain among the syntactically relevant semantic components used by the L&RH mapping system. Both the directed change and the existence linking rules take precedence over the immediate cause rule. L&RH exemplify this with verbs that, in some contexts, fall under both rules but maintain their unaccusative syntactic status: inherently directed motion verbs and stative verbs, which are unaccusative even when they are used agentively, and internally caused verbs of change of state. But the data in 3.1 show that causation is irrelevant for monadic intransitives denoting change of location, and only marginally relevant for verbs denoting change of state. This explains why in many cases the directed change linking rule appears to take precedence over other linking rules, whereas in fact it would not compete at all with the immediate cause rule, since causation is not syntactically relevant for monadic verbs of change of state. Some of these verbs indeed have an inherent internal cause (as in *Mary arrived at the meeting on time*; *The wood decayed at an alarming rate*), or may contextually be construed as internally caused, but their syntax is not affected because causation is not a syntactically relevant component of their semantics.

The fundamental problem with L&RH's account is that telicity, like agentivity, is regarded as a discrete property that a verb either has or does not have. This is apparent in their comment that, if telicity and agentivity were semantic determinants of unaccusativity/unergativity, 'one would expect verbs that are neither telic nor agentive to display uniform behavior in any given language. Strikingly, however, this is not the case'. (1995:168).

L&RH exemplify their point with verbs of emission, on the one hand, and verbs in the *roll* class, on the other, both atelic and usually nonagentive; they claim these verbs are unergative and unaccusative, respectively. But why should these verbs be predicted to have uniform syntactic behavior simply because they lack the feature agentivity or telicity? The data presented here point to the OPPOSITE generalization for these verbs, that is, they display variable auxiliary selection, both within and across languages: in the case of emission verbs, because they are THE LEAST agentive; in the case of *roll* verbs, because these verbs are susceptible to compositional event-type shifts, that is, they are primarily atelic activity verbs that can shift aspectual class (and therefore syntactic class) in the presence of a telic expression. I suggest that verbs can lexically express telicity to different degrees, depending on whether they denote a final resulting state or a series of interim states. Agentivity can also be regarded as a gradient notion: it depends on the combination of various elements of the predicate in which a verb appears, for example, the degree of volitionality of the subject (van Hout 1996) and its aspectual prominence in event structure (Grimshaw 1990).

L&RH's approach is supposed to be particularly suited to the explanation of variable-behavior verbs. Two types of variable behavior in monadic intransitive verbs are distinguished which, within this model, are the exception rather than the rule.

to auxiliary selection, six diagnostics (impersonal constructions, *en*-cliticization, infinitival relatives, *tough* construction, adjectival passives and participial constructions). From Labelle's analysis it emerges that the verbs selecting *être* also behave like unaccusatives with respect to the other tests, and the verbs selecting *avoir* also fail the other unaccusativity tests (see also Zubizarreta 1987). While it is true that some verbs usually select *avoir* and pass one or more tests of unaccusativity, such verbs are inconsistent in their behavior, or are less felicitous in these tests than the *être*-selecting verbs: an example mentioned by Labelle is *disparaître*, which can appear in the impersonal construction *Il a disparu des douzaines de livres* but sounds less natural than *Il est arrivé trois hommes*. '... the verbs constructed with *être* form the core cases of unaccusative verbs in French' (Labelle 1992:380).



The first type arises when two verbs sharing the same element of meaning are associated with different lexical semantic representations. This type subsumes all cases of verbs that have a basic classification but can shift syntactic class in certain aspectual contexts: these event-type shifts are compositional, not lexical. Verbs participating in event-type shifts in different languages include manner-of-motion verbs (*run fast* vs. *run to the store*), and sound emission verbs (*rumble* vs. *rumble through the gate*). Weather verbs in Italian (§4.4) display the same kind of alternation (*tuonare* ‘thunder’ vs. *tuonarci sopra* ‘thunder over us’). According to L&RH, these verbs have an inherent classification as activity verbs and normally display unergative syntax; when they telicize as a result of their combination with predicate features, they become verbs of change of location by means of a lexical rule and display unaccusative syntax.<sup>31</sup>

The second type of variable behavior results from the fact that in some cases the same verb is compatible with more than one semantic template, and thus displays different interpretations. Unlike the first type, this type of ambiguity is inherently lexical and suggests that some verbs allow multiple conceptualizations. L&RH imply that this type of variation, which they regard as idiosyncratic, is relatively sporadic and not rule-governed. The data presented in §§3 and 4, however, strongly suggest that it is both relatively systematic and rather widespread.

Lexical ambiguities are found among all noncore monadic verbs on the ASH, albeit to different degrees. Crucially, core verbs do not display ambiguity and therefore are not variable in auxiliary selection. Ambiguities are exhibited by verbs of indefinite change, which denote directed change but not inherent telicity. Because of their underspecified aspectual structure, stative verbs have especially unstable valence, particularly in Italian, in which some of these verbs are associated with interchangeable use of auxiliaries because they may be conceptualized either as eventive or as stative. Other verbs have one auxiliary in the standard language but are frequently found with the other auxiliary in nonstandard usage. Native speakers do not have strong preferences for one auxiliary over the other (Bard et al. 1998). Verbs primarily denoting involuntary process, emission, continuation of state, and existence of state show this alternation, which is again due to the possibility of multiple interpretations.

Within L&RH’s model, there is only one mechanism to account for rule-governed variable behavior, namely to assume double lexical representations, one basic and one derived, related by lexical mapping rules that systematically generate the latter from the former. This is a viable mechanism only to the extent that variation is limited to a small number of classes. It becomes cumbersome and uneconomical, though, if variation is a more widespread characteristic of verbs, and it burdens the lexicon with a proliferation of multiple entries that make it unlearnable. L&RH have no mechanism that deals with (what they consider) non-rule-governed lexical ambiguities because there is no sense in which verbs exhibiting this type of variation can be said to have a ‘basic’

<sup>31</sup> A referee points out that telicity may only have to be inferred, rather than overtly expressed, for auxiliary BE to be selected, as in example (i).

- (i) Ho sentito un rumore terribile che veniva dalla cucina, sono corsa  
 have-1SG heard a noise horrible that came from the kitchen, am-1SG run  
 e ho visto i piatti per terra.  
 and have seen all the dishes on the floor

‘I heard a terrible noise from the kitchen, I ran and saw all the dishes on the floor.’

This example suggests that verbs of motional process present lexical ambiguity, in addition to being susceptible to compositional event-type shifts.

version. In this respect, L&RH's model cannot account for the structured variation in auxiliary selection represented in the ASH.

**5.3. THE CONSTRUCTIONAL MODEL.** An alternative perspective on the lexicon-syntax interface attributes the interpretations associated with particular constructions not to the argument structure of verbs, but rather to the syntactic configurations a verb can appear in. The lexical entries of verbs are underdetermined, in the sense that they specify the number of arguments but not their hierarchical realization. In Borer's (1994) account (but see McClure 1995 and van Hout 1996 for similar proposals), verbs project an 'unordered' VP, which is dominated by at least one syntactic aspectual node. The telicity interpretation typical of unaccusative verbs, and the atelic interpretation typical of unergative verbs, are derived from the presence or absence of an aspectual functional head associated with event measurement (AspE). The single argument of an intransitive verb is interpreted as a measure if it is projected in the specifier position of this aspectual head and enters into a specifier-agreement relationship before moving to the specifier of TP to receive nominative case. In the absence of the event measurement projection, the argument projects directly in the specifier of an aspectual head associated with process readings (AspP) and the resulting interpretation is atelic. The configurations giving rise to telic and atelic interpretations are given in 52 (see Borer 2000).

- (52) a. Intransitive, telic: [TP NP<sub>i</sub> [AspE' t<sub>i</sub> [VP [V ]]]  
 NOM  
 b. Intransitive, atelic: [TP NP<sub>i</sub> [AspP' t<sub>i</sub> [VP [V ]]]  
 NOM

The event measurement functional head may be projected either because of the inherent telicity of the verb, or because this is required by the presence of an overt delimiting phrase in the predicate. Verbs have a 'core' lexical meaning, which contributes to some extent to the overall interpretation, but only as a modifier of the structural meaning imposed by the syntax. Interpretation is determined compositionally by the core meaning contributed by its lexical entry and by the meaning of the construction.

The constructional model is different from the projectionist model in two major respects. First, within this model unaccusativity and unergativity are constellations of phenomena derived from the verb's ability to appear in particular syntactic configurations. Second, optionality is built into the system: since verbs are not lexically specified as unergative or unaccusative, their syntactic status is unstable. While this built in optionality makes the model more suitable for handling variation in general, the problem of structured variation remains unaddressed: the ASH shows that some verbs are NOT variable since they invariably select one auxiliary; others can select both but to varying degrees. This problem is explicitly recognized by Borer:

It is thereby predicted that a verb such as *run* is perfectly ambiguous between a so-called unergative and unaccusative reading . . . this prediction appears problematic . . . clearly one would need to explain why some intransitives are much more susceptible to the MEASURE/NON-MEASURE alternation than others. A possible explanation may be found in the appropriate characterization of particular verbs and their contribution to the meaning of the predicate in which they are embedded. SPECIFICALLY, IT MAY BE THAT THE MEANING OF SOME VERBS ENTAILS DELIMITATION MUCH MORE STRONGLY THAN OTHER VERBS.  
 (1994:32, emphasis added)

It therefore seems that the substantial overgeneration brought about by the constructional system needs to be constrained by identifying the specific contribution of the meaning of individual verbs and their compatibility with particular syntactic configura-

tions. Recent research on the relationship between event semantics and argument realization has begun to shed some light on the question.

**5.4. EVENT SEMANTICS AND EVENT-TYPE SHIFTS.** Rappaport Hovav and Levin (1998), addressing the problem of variation in the argument expression of verbs, attempt to identify more precisely the range of meanings that can be associated with particular verb types, as well as the syntactic conditions that license derived meanings and further constrain the semantic flexibility of verbs. Similarly to Borer, Rappaport Hovav and Levin also distinguish between a structural aspect and an idiosyncratic aspect of verb meaning, or ‘constant’: the structural aspect, which they locate in the lexicon, is the one relevant to argument realization and can be represented as an inventory of event structure templates corresponding to the Vendler-Dowty classification:

[x ACT <i>(MANNER)</i> ]	process (‘activity’)
[x <i>(STATE)</i> ]	state
[BECOME [x <i>(STATE)</i> ]]	transition (‘achievement’)
[[x ACT <i>(MANNER)</i> ] CAUSE [ BECOME [y <i>(STATE)</i> ]]]	transition (‘accomplishment’)
[x CAUSE [BECOME [y <i>(STATE)</i> ]]]	transition (‘accomplishment’)

The set of event-structure templates is fixed but the set of constants (represented by the italicized materials in angled brackets) is open-ended. The ontological type of constant (whether it is a state, thing, place, or manner) determines its pairing with a particular event structure template, via canonical realization rules. This operation produces the basic meaning of verbs. Derived verb meanings are derived through the ‘expansion’ of simple event-structure templates into more complex ones. This process, which Rappaport and Levin name *TEMPLATE AUGMENTATION*, is incremental and monotonic. ‘Event structure templates can be freely augmented up to other possible templates in the basic inventory of event structure templates’ (1998:111).

Template augmentation is subject to well-formedness conditions that ensure the identification of event structures in the syntax: the *SUBEVENT IDENTIFICATION CONDITION* ensures that each subevent in the event structure is identified by a lexical head in the syntax; the *ARGUMENT REALIZATION CONDITION* ensures that an argument in the syntax corresponds to each participant in the event structure, and is associated with an identified subevent. Although this model does not specify the precise syntactic expression of participants in event structures (i.e. whether they are realized as subjects or objects), other studies have put forward proposals on the syntactic projections of particular event types (see van Hout 1996, McClure 1995, Arad 1998a).

The combination of the basic event-structure templates, template augmentation and the well-formedness conditions accounts for the rigidity of transition predicates and for the flexibility of stative predicates: accomplishments have a fully specified event structure template that cannot be augmented; achievements have a simple event structure that could be augmented only by the addition of a causing subevent, which is excluded because these verbs are not conceptualized as having a causer. Stative predicates, in contrast, are highly flexible because their event-structure template can be freely augmented to form more complex event structures (i.e. achievements and accomplishments).

This approach can be regarded as a step towards a theory of the compatibility between constants and the syntactic structures they can appear in. Template augmentation is conceived of as a lexical operation in Rappaport Hovav and Levin’s model, and in effect a refinement of their previous projectionist proposals. However, it is in principle

compatible with the constructional approach, in which it would be an interpretive, postsyntactic operation (see Levin & Rappaport Hovav 1996 for discussion). In fact, the projectionist and the constructional approaches appear to be closer than before. Different syntactic configurations, which in the constructional approach provide the structural meaning of verbs, correspond to different event structure templates in the projectionist model. The core meaning of verbs, which in the constructional approach is a concept compatible with the structural meaning of more than one configuration, correspond closely to the notion of constant in the projectionist model. Together, these proposals contribute the foundations of a framework that might eventually explain the structured variation embodied by the ASH. On the assumption that the syntax of auxiliary selection is sensitive to event structure, alternations in auxiliary choice are a function of the flexibility of a verb's meaning and the range of possible interpretations that it can have. Core verbs at the extremes of the ASH are not susceptible to multiple interpretations and are therefore compatible with only one structural meaning: their rigidity is reflected by the lack of variation in auxiliary selection. Intermediate verbs, in contrast, are compatible with more than one structural configuration and can therefore be associated with a wider range of interpretations: Their flexibility is reflected by variation and indeterminacy in auxiliary selection.

The overall picture, however, is likely to be more complex. The gradience in the ASH points to the necessity of an account that allows for finer structural distinctions than the ones permitted by either the projectionist or the constructional model. A full explanation of the gradients requires a better understanding of the interplay of lexical and structural meaning and, in particular, a theory of the specific contribution of the idiosyncratic meaning of verbs and its interaction with verbs' structural meaning.

**6. THE BROADER VIEW: TYPOLOGICAL IMPLICATIONS.** In this article I presented a generalization on auxiliary selection in some Western European languages. The choice of auxiliary with particular verbs is characterized by gradience: Some verbs more consistently select a particular auxiliary than others. The gradience is a reflection of distinctions among intransitive verbs in terms of their aspectual and thematic structure, which define a hierarchy of verbs that are likely to prefer one or the other auxiliary. While verbs selecting *BE* normally denote transitions and states crosslinguistically, verbs of telic change of location are the most likely to select *BE*. Similarly, verbs selecting *HAVE* normally denote processes, but verbs of controlled, unaffected, nonmotional processes are the most likely to select *HAVE* across languages. Although auxiliary selection appears to be governed by this hierarchy in all the languages examined here, individual languages are differentially sensitive to it, in the sense that they set the boundary between *HAVE*- and *BE*-selecting verbs at different locations. The hierarchy appears to underlie the way auxiliary selection is perceived by native speakers, and the order in it is acquired by non-native speakers.

Do these data enable us to make wider typological generalizations? A full answer to this question must naturally await data from many more languages, but it is nevertheless possible to formulate some empirically testable hypotheses. First, the data reviewed in this article suggest that not all languages distinguish all classes represented on the ASH: classes may be merged, or languages may make finer distinctions within individual classes. Nevertheless, I predict that the implicational relationships among verb classes are maintained from language to language. Other things being equal, it should not be possible for a language to exhibit consistent auxiliary selection behavior (or consistency

in other syntactic manifestations of split intransitivity, if one assumes that auxiliary selection is one of them) with intermediate verbs but not with core verbs.<sup>32</sup>

Second, within any given language there is a cutoff point on the ASH between verbs that select auxiliary BE and verbs that select auxiliary HAVE. The cutoff point cannot be identical in all languages, since if it were, all languages would have exactly the same system of auxiliary selection. Thus, the locus of variation must be in the mapping governing the interface between the lexicon and the syntax. Mapping must be language-specific because the location of the cutoff point along the hierarchy may be different. Any change in the location of the cut-off point, however, affects the verbs in the middle of the hierarchy, but—crucially—not the core.

I touched briefly on potential theoretical implications of the ASH for theories of split intransitivity, suggesting that projectionist models of the lexicon-syntax interface, such as the ones directly inspired by the unaccusative hypothesis, cannot easily accommodate these data. However, constructional models, which incorporate the concept of FREE MAPPING, do not fare much better unless they are complemented by a theory of constraints on the event structure of verbs, and especially by a theory of the compatibility between the lexical and the structural meanings of verbs.

Further research will be needed to tell whether the hierarchy is also found in other languages with a choice of perfective auxiliaries, and whether it governs other syntactic manifestations of split intransitivity in Western European languages and in a wider range of typologically different languages. For the moment, this approach can be regarded as a working hypothesis that makes it possible to formulate testable predictions in this domain.

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<sup>32</sup> A referee asks what would count as a counterexample to the ASH. Such a hypothetical language, if it existed, would clearly represent one.

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