The Aspectual Influence of the Noun: (A)telicity, (A)symmetry, Incrementality and Universality

Jonathan E. MacDonald*
Departament de Filologia Espanyola, Universitat Autònoma de Barcelona

Abstract

Since Verkuyl (1972), we have known that a noun phrase can affect the (a)telicity of the verbal predicate. Since then, there have been both semantic and syntactic accounts of this aspectual influence of the noun (AIN). This raises the question of whether the AIN is best accounted for in semantic or syntactic terms, that is, whether it is more appropriately treated as semantic or syntactic in nature. In this article, I outline a representative range of semantic and syntactic approaches to the AIN with an eye to which of these accounts best handles three related observations: the independence of incrementality and the AIN, an asymmetry in aspectual contribution by count and mass nouns, and the non-universality of the AIN.

1. Introduction

Verbal predicates describe events and can do so in different ways. When we talk about inner aspect, or the aspectual interpretation of a verbal predicate, we refer to the internal structure of an event, or event structure. The aspectual interpretation of a (verbal) predicate, or its event structure, can depend on a variety of elements within the verb phrase (VP), including the verb (V), noun phrases (NPs), and secondary predicates, such as prepositional phrases (PPs) or resultative predicates. So, for example, consider the sentence in (1).

(1) John ate a slice of pizza (last night at the party).

The event described by (1) is understood to have come to an end (last night at the party). There is an inherent endpoint to the event described by (1), and the direct object NP is understood to mark, or determine, this endpoint in the following way: given the nature of what it means to eat, the quantity of the object being eaten is reduced as the eating progresses through that object, until the final bite reduces the quantity of the object to zero. Once the quantity is at zero, once there is no more slice of pizza, the event of eating a slice of pizza has reached its inherent endpoint. In this way, we understand the event described by (1) as having come to an end. This contrasts with the event described by the predicate in (2).

(2) John ate pizza (last night at the party).

The predicate in (2) does not indicate whether the event of pizza eating came to an end (last night at the party). There is no inherent endpoint marked, or determined, by the direct object NP. Although the quantity of pizza is also reduced − again, because of the nature of what it means to eat pizza − in this case, as the amount of pizza is not determined, or specified, in principle, the pizza eating event could go on indefinitely.

Now, it is true that pragmatically speaking, in normal conversation, we do understand both events in (1) and (2) to have come to an end in the past, before the time at which they are uttered, that is, before now. This, however, is an artifact of tense, which we know must be distinguished from inner aspect (see, for instance, Comrie 1976). Briefly, if we understand tense as a ordering relation between the time at which an utterance takes place (i.e. now) and, simplifying a bit, between the time at which an event takes place (following assumptions in, for instance, Demirdache and Uribe-Etxebarria 2000, 2004; based on Reichenbach 1947), then past tense can be understood as an event ordered before now (future being an event ordered after now). Given this understanding of tense in combination with the pragmatic knowledge that pizza eating does not tend to continue all night by a single person until the next day, there is a sense in which we understand the event described by (2) to come to an end. Again, though, this is an arti-fact of tense (see Depraetere 1995 for a discussion of a similar distinction). We can say that in (1) the event described by the predicate has an endpoint linguistically encoded, while in (2) this is not the case. This comes out in (3a) and (3b), which are continuations of (1) and (2), respectively.

(3)   a. # …and he is still eating the slice of pizza now.
       b.   …and he is still eating pizza now.

The continuation in (3a) is infelicitous (indicated by #) precisely because the event of eat-ing the slice of pizza ended before now, at the time that the slice of pizza in question was finished. Note that with the indefinite determiner, i.e. *a slice of pizza*, there is an available reading of (3a) in which a different slice of pizza is being eaten now; on this interpretation, the continuation is fine. Nevertheless, given a different slice of pizza, we have a different event, and there is no immediate reason why a distinct event of the same type could not be taking place now. The point here is that the same event itself cannot be understood to continue until, and be taking place now, because it has reached an endpoint in the past. This contrasts with (3b), which is felicitous because there is no linguistically encoded end-point. The same event can be understood to continue until, and be taking place, now.

With respect to terminology, predicates that describe events as having a linguistically encoded endpoint are often referred to as telic predicates, or said to be bounded or delimited [or to have a *set terminal point*; Krifka (1989)]. Those predicates that do not describe events as having an endpoint are usually referred to as atelic predicates, or said to be unbounded or non-delimited. The predicate in (1) is telic and the predicate in (2) is atelic. The only difference between the two predicates is in the direct object. The direct object NP affects the (a)telicity of the predicate; this was first noted by Verkuyl (1972). I will refer to this phenomenon in which the noun exercises aspectual influence over the verbal predicate as the aspectual influence of the noun (AIN). The AIN is the main focus of the present article.

2. Two More Observations Regarding the AIN

There is an important question regarding the exact nature of the property of an NP like *a slice of pizza* such that it can give rise to a telic predicate and the exact nature of the property of an NP like *pizza*, such that it can give rise to an atelic predicate. I will only mention some proposals further below, without discussing their empirical or theoretical implications, because the exact relevant property of the NP itself is not the main focus of the present article. Consequently, I will simplify radically and use traditional terminology

and refer to NPs like *a (slice of) pizza* in (1) as *count nouns* (CNs) and NPs like *pizza* in (2) as *mass nouns* (MNs). Again, this is an oversimplification. See, Borer (2005), Krifka (1989, 1992), Moltmann (1991), Rothstein (2004), Verkuyl (1972, 1993) or Zucchi and White (2001) for discussion of the relevant property of an NP that allows it to participate in the AIN.

Again, the effect of the AIN is an alternation between a telic predicate (i.e. a predicate with an endpoint) and an atelic predicate (i.e. a predicate without an endpoint). As a test for the (a)telicity of a predicate, the (in)compatibility of the *in*-adverbial (or *time span adverbial*), and the *for*-adverbial (or *durative phrase*) is widely employed (See Dowty 1979, chapter 2 for more tests.); their (in)compatibility is illustrated in (4).

(4) a.   John ate a slice of pizza   # for ten minutes/in ten minutes.
     b.   John ate pizza   for ten minutes/#in ten minutes.

Telic predicates, as in (4a), are incompatible with a *for*-adverbial on a single event, or non–iterative interpretation, and compatible with an *in*-adverbial on the interpretation that the event came to an end after the period of time expressed by the *in*-adverbial. In contrast, atelic predicates, as in (4b), are compatible with a *for*-adverbial on a single event interpretation – although note that there is no entailment that the event ends after the period of time expressed by the *for*-adverbial (Tenny 1994) – and incompatible with an *in*-adverbial on the interpretation that the event ends after the period of time expressed by the *in*-adverbial.

As noted earlier, the NP *a slice of pizza* marks the end of the event in as much as when the slice is finished, the slice of pizza eating event is over. In Tenny's (1994) terms, these objects are said to *measure out* the event. Dowty (1991) refers to verbs like *eat, drink,* or *build* as *incremental theme verbs*, since progress through their themes (e.g. *a slice of pizza* and *pizza*) occurs in increments, or bit(e) by bit(e). For a complete understanding of the AIN, it should be noted that although we find incrementality in the cases discussed so far, incrementality and the AIN are independent of each other.

First, as Tenny (1994:15) notes 'Delimitedness does not imply measuring-out, although the converse is true' (see also Borer 1994). This can be illustrated by a series of data, the first of which is in (5).

(5) a.   John carried a bag/sand   for an hour/#in an hour.
     b.   John dragged a log/wood   for an hour/#in an hour.

Note that these predicates (transitive activities) do not show the AIN. Dowty (1991) calls these themes *holistic themes*, because the whole of the object is affected 'all at once' by the action of the verb and not bit by bit as is the case for incremental themes. Stated differently, no incremental relation holds between the theme and the event in (5). As Dowty (1991) further observes, however, when a PP is added, as in (6), an incremental relation is established between the path of motion and the event, because the progress of the event can be followed by tracking the location of the bag/log along the path.

(6) a.   John carried a bag into the room   #for an hour/in an hour.
     b.   John carried a log into the barn   #for an hour/in an hour.

Additionally, note that these predicates are now telic, because the PP adds an endpoint (or delimiter), as has been widely observed (Borer 2005; Dowty 1979; Folli 2000; Folli

and Ramchand 2001; Gerhke 2008; Krifka 1992; MacDonald 2008a,b; Pustejovsky 1991; Ritter and Rosen 1998; Thompson 2005, 2006; Tungseth 2005; Zwarts 2005). Now, as MacDonald (2008a, b) observes, when a MN direct object is present, these predicates become atelic, illustrated in (7).

(7) a. John carried sand into the room for an hour/#in an hour.
     b. John carried wood into the barn for an hour/#in an hour.

Although these themes are not incremental, the direct object NP still affects the (a)telicity of the predicate. That is, we still see the AIN. Incrementality is not a crucial part of the AIN; it is not necessary for a theme to establish an incremental relation with the event to participate in the AIN. Consider another set of supporting data; consider the achievements in (8).

(8) a. John dropped the book   #for an hour.
     b. John shattered the vase   #for an hour.

Verbs that head achievements are not incremental theme verbs, yet as illustrated by the shift to an atelic interpretation in (9) due to the presence of a MN direct object, they still show the AIN.

(9) a. John dropped paper   for an hour.
     b. John shattered glass   for an hour.

The AIN is an alternation between a telic and an atelic predicate due to the influence of an NP, and it is independent of incrementality.

Consider a second property important for a more precise characterization of the AIN. It has been observed for over 20 years that in the presence of a CN direct object, a predicate is not unambiguously telic (see, for instance, Alsina 1999; Jackendoff 1996; Tenny 1987; Verkuyl 1993). Although this has been noted, often in footnotes, typically, the facts are presented in a fashion similar to those in (4a): a telic predicate, due to the presence of a CN direct object, is marked simply as infelicitous (or ungrammatical) with a *for*-adverbial. Only recently (see Smollet 2005 and Piñón 2008) has there been explicit discussion of the felicitous interpretation of the *for*-adverbial with a predicate like that in (4a), i.e. *John ate a slice of pizza for ten minutes*. As Smollet (2005) and Piñón (2008) note, the *for*-adverbial is felicitous here on an interpretation in which the slice of pizza has not been entirely consumed, a type of partitive interpretation. This observation takes on more relevance for the proper account of the AIN, when we add to it the observation from Piñón (2008) regarding the aspectual contribution of MNs: MNs, in contrast to CNs, unambiguously give rise to an atelic interpretation of the predicate. That is, there is an asymmetry in aspectual contribution by CNs and MNs in the AIN. CNs do not unambiguously give rise to telicity, while MNs unambiguously give rise to atelicity. A proper treatment of the AIN should reflect this asymmetry in aspectual contribution.

3. Is the AIN Syntactic or Semantic in Nature?

Three observations regarding the AIN have been made: (i) It is an alternation between a telic and an atelic predicate due to the aspectual influence of an NP; (ii) The NP exercises its aspectual influence independently of incrementality; and (iii) The aspectual

contribution of CNs and MNs is not symmetrical. Now, there has been an array of both syntactic and semantic accounts of the AIN for some time, which immediately raises the question of whether it is best to treat the AIN in semantic or syntactic terms. There is one sense in which the three observations about the AIN are independent of whether their treatment is best handled in semantic or syntactic terms; both should be able to handle these three observations. On the other hand, it may be the case that these three observations give insight into answering the question of whether it is best to treat the AIN as fundamentally syntactic or semantic in nature.

In terms of theoretical models, whether a linguistic phenomenon is syntactic or semantic in nature reduces to the location of the operations assumed to account for it within the faculty of language. I assume that there are different components that make up the faculty of the language, minimally one dedicated to syntactic operations, and one dedicated to semantic operations. (I am ignoring the morphological and phonological components for the present discussion.) If we take a Chomskian inverted Y model that assumes cyclic operations (i.e. phases), then we can say that the syntactic component builds up structure, and then sends this complex structure to the semantic component for interpretation or further operations. In this respect, the semantic component comes after the syntactic component. Assuming an architecture along the lines of Culicover and Jackendoff (2005), in which syntax and semantics operate simultaneously in parallel, and then pair up via linking rules, semantics is not necessarily after syntax. Regardless of the details, in both of these generative models, the syntactic and semantic components have some degree of autonomy from each other. In the former, the semantics can depend on the syntax, while in the latter this is not the case. Thus, the question of whether the AIN is a semantic or a syntactic phenomenon is a question about where the operations accounting for it are assumed to be located: in the syntactic component or in the semantic component. Semantic accounts assume that the operations underlying the AIN take place in the semantic component, while syntactic accounts assume that the operations underlying the AIN take place in the syntactic component. So, posing the question again: Is the AIN a semantic or a syntactic phenomenon? That is, are the operations underlying the AIN best located in the semantic or in the syntactic component? In order to be able to provide an answer, let us consider some semantic and syntactic accounts of the AIN, and their underlying operations.

3.1. SEMANTIC APPROACHES TO THE AIN

3.1.1. Verkuyl and the Plus Principle

Verkuyl (1972) is often acknowledged as first observing the AIN. In Verkuyl (1993), a more concrete semantic approach is laid out in model theoretic terms. Verkuyl proposed the existence of certain semantic features, or properties, associated with verbs and NPs that, depending on their combination, give rise to a telic or an atelic predicate. With respect to verbs, there are [+ADD TO] verbs and [–ADD TO] verbs. Essentially, [–ADD TO] verbs are stative, or non-dynamic (e.g. *want, hate, own,* etc.), while [+ADD TO] verbs are eventive, or dynamic (e.g. *eat, walk, draw, knit,* etc.). With respect to NPs, Verkuyl differentiates two classes: [+SQA] and [–SQA], where SQA is shorthand for *specified quantity of A*, A the denotation of the head noun of the NP in question. So, for example, *a slice of pizza* is a +SQA NP, while *pizza* is a –SQA NP. Restricting the discussion here to the features of the direct object NP and the verb – Verkuyl also discusses the features of the subject NP – (a)telicity results from the combination of these aspectual features. Consider the sentences in (10), with their corresponding feature combinations to their right.

(10) a. John ate a chicken. → [+ADD TO] + [+SQA] = telic
     b. John ate chicken. → [+ADD TO] + [−SQA] = atelic
     c. John owned livestock. → [−ADD TO] + [−SQA] = atelic
     d. John owned a car. → [−ADD TO] + [+SQA] = atelic

Observe that only when there are all plus features, as in (10a), does telicity (or *terminativity* in Verkuyl's terms) result. If the NP, as in (10b) or (10c), or the verb, as in (10c) or (10d) have a minus value, the result is atelicity (or *durativity* in Verkuyl's terms). Telicity is the result of the *Plus-principle*, i.e. the 'requirement that all aspectual 'atoms' involved are plus-values' (Verkuyl 1993: 20).

The AIN is accounted for by the different combinations of features. The aspectual contributions of [+SQA] and [-SQA] NPs – or CNs and MNs using our terminology – are symmetrical, because, if the verb is [+ADD TO], the SQA feature, be it + or −, determines the (a)telicity of the predicate equally. Likewise, if the verb is [-ADD TO], the SQA feature, be it + or − does not affect the (a)telicity of the predicate. Finally, these feature combinations calculate (a)telicity independently of incrementality.

3.1.2. Krifka and Incremental Homomorphic Mapping

Krifka (1989) attempts to account for the (a)telicity of a predicate which results from the AIN by considering the mereological, or part structure, properties shared by both nominal and verbal predicates. So, for example, the NP *a slice of pizza* has *quantized* reference, because the denotation of the sum of *a slice of pizza* and *a slice of pizza* does not fall within the denotation of *a slice of pizza*, but within the denotation of *two slices of pizza*. In contrast, the NP *pizza* does not have quantized reference; it has *cumulative* reference because the sum of the denotation of *pizza* and *pizza* falls within the denotation of *pizza*. The verbal predicates *eat a slice of pizza* and *eat pizza* can also be treated in these mereological terms. That is, the sum of the denotation *eat a slice of pizza* and *eat a slice of pizza* does not fall within the denotation of *eat a slice of pizza*, but within the denotation of *eat two slices of pizzas*. So, just like the NP *a slice of pizza*, the VP *eat a slice of pizza* also has quantized reference. In contrast, the sum of the denotation of the VP *eat pizza* and *eat pizza* falls within the denotation of the VP *eat pizza*. Thus, the VP *eat pizza* has cumulative reference, just like the NP *pizza*.

As both NPs and VPs have mereological properties in common, Krifka (1989, 1992) takes advantage of these properties to explain the telicity of *eat a slice of pizza* and the atelicity of *eat pizza*. Krifka conceives of the AIN as a homomorphic (or part-structure preserving) mapping, or transference, of mereological properties from the nominal domain to the verbal domain. Essentially, *eat a slice of pizza* has quantized reference because *a slice of pizza* has quantized reference, and a VP with quantized reference gives rise to a telic predicate. (But, note that not all telic predicates can be characterized as quantized, as Krifka (1992) illustrates with the predicate *walk to Paris*). In contrast, *eat pizza* has cumulative reference because *pizza* has cumulative reference, and a VP with cumulative reference gives rise to an atelic predicate.

Krifka accounts for the AIN by showing that quantized NPs give rise to telicity and cumulative NPs give rise to atelicity. Incrementality is a crucial part of his approach, on the one hand, because, as widely acknowledged, his focus is alone on incremental theme verbs, and on the other, because the notion of a homomorphic mapping based on mereological, or part structure properties, does not make sense if these parts are mapped all at

once; they are mapped bit by bit, preserving their part structure. Finally, there is nothing in the definitions of quantized NP vs. cumulative NP – or in the transference/mapping from the nominal domain to the verbal domain – that would indicate that their aspectual contribution should be asymmetrical in the sense discussed earlier.

3.1.3. Jackendoff and Structure-Preserving Binding

Working within the framework of conceptual semantics, Jackendoff (1996) approaches the AIN by taking motion events as a starting point. He focuses on the intuitive relation between the location of an object along a path, the time course of the event, and the event itself. More concretely, he takes a motion event to be a 'multi-dimensional con-strual' in terms of an object X, at a location l_i, at some point in time t_i. These three 'axes' together are taken to represent the cross-section of the entire motion event, on a par with the cross-section of a generalized cone. Following Marr (1982), Jackendoff takes a generalized cone to be a three-dimensional shape formed by a cross-section and a perpen-dicular axis. At any point along the cone's axis, the shape of the cross-section remains the same, while its size may vary. As an example, take an H-beam; at any cross-section along the beam, the H-shape holds; the beam itself is the projection of the H-shaped cross-section. The three axes of a motion event together represent a cross-section of the entire motion event, like the H-shaped cross-section does for the entire beam. When they pro-ject, the three axes together derive the whole motion event, much like the projection of the H-shaped cross-section gives rise to the entire beam. Jackendoff states that the intui-tion behind the AIN is that the three individual axes are not independent, but linked to each other. The event, path, and time axes are connected by a *structure-preserving binding relation* (sp-binding) such that any point on any of the three axes is linked to some point on the other axes, and this is the case for all points along any of the three projected axes.

   For Jackendoff, sp-binding is the key to the AIN. That is, if the path or object (on one axis) is bounded, the event (on another axis) is also bounded (or telic), because the axes are linked. Likewise, if the path or object is unbounded, then the event is also unbounded (or atelic), because the axes are linked. In this way, the AIN depends on the link between axes. Measuring out (or incrementality) also depends on the link between each axis, as Jackendoff (1996: 322) indicates: 'The intuition behind measuring out is that the three-one-dimensional axes…are not independent; rather, they are linked to one another'. Incrementality (or measuring out) and the AIN are intimately related, because they are both intimately tied to sp-binding. Additionally, note that because both bounded and unbounded objects – CNs and MNs in our terminology – (and paths) equally partici-pate in sp-binding, their aspectual contribution is symmetrical.

3.1.4. Piñón and Degrees

Like Krifka (1989, 1992), Piñón (2008) takes the mereological properties of cumulativity and quantizedness to be the defining properties of atelicity and telicity, respectively. Piñón (2008) stands apart from Krifka, as well as the other semantic approaches to the AIN, in as much as he acknowledges and attempts to account explicitly for the asymmet-rical aspectual contributions of CNs and MNs. He does so by proposing that verbs that take incremental themes have a degree argument that tracks the degree to which the event described by the predicate is carried out on a scale from 0 to 1, 1 being the maxi-mal degree. If the event is carried out to 0 degrees, it is not carried out at all. If the event is carried out to 0.5 degrees, it is carried out halfway. An important aspect of Piñón's system is that corresponding to the single syntactic internal argument of an incremental theme verb is both an individual and its description. This is key to how the degrees play

a role in measuring the change in the event. The degree to which the individual is directly affected by the action of the verb, i.e. the quantity of *applesauce* in *eat applesauce*, is not itself measured, but the degree to which the individual *as its type description* is measured. That is, 'we are not measuring quantities of applesauce that are eaten – we are measuring the degree to which the event type 'eat applesauce' is realized' (Piñón 2008: 26). In this way, verbs that take incremental themes are relations between individuals, descriptions, degrees, and events.

Given that verb phrases are two-place relations between events and degrees, the degree argument of the verb must be discharged. Piñón proposes two ways to do so: with a degree-maximizing operator or with a positive degree-binding operator. The degree-maximizing operator entails that an event is carried out to its maximal degree, i.e. to 1. The positive degree-binding operator entails that an event is carried out to a positive degree, i.e. to x, $x > 0$, although not necessarily to its maximal degree. Now, the availability of both a telic and an atelic interpretation for a predicate like *eat a slice of pizza* is dependent on whether the degree argument is discharged by the degree-maximizing operator or the positive degree-binding operator. If the former, the whole pizza is understood to be eaten, the predicate is quantized and thus telic. If the latter, only part of the pizza is understood to be eaten, the predicate is cumulative and thus atelic. In the case of a predicate like *eat pizza*, independently of whether the degree argument is discharged by the degree-maximizing operator or the positive degree-binding operator, the result is a cumulative, atelic predicate. This is because any degree of pizza eating is pizza eating to the maximal degree. That is, once engaged in pizza eating, it does not matter to what degree the pizza eating is being carried out, it is maximally pizza eating.

Piñón derives the AIN via a mereological approach, essentially following Krifka. That is, a quantized verbal predicate is telic, and a cumulative verbal predicate is atelic. In this way, he inherits the intimate tie between incrementality and the AIN. In contrast to Krifka, however, given the proposal of the degree argument (for incremental theme verbs), and the two operators that can discharge the degree argument, the aspectual contribution of CNs and MNs is asymmetrical.

3.2. SYNTACTIC ACCOUNTS OF THE AIN

3.2.1. Borer and One Relation with One Functional Projection
Borer (1994) assumes the existence of an AspP-E(vent)M(easure) phrase which can have a specifier position present or not. If the specifier position is present, an NP must move to/through it. An NP that does this receives the event role of event measure, and the event is measured out. In this case, telicity arises. In the case in which no specifier position is available, the relevant aspectual properties are not activated, and the resulting predicate is atelic. In this latter case, there is no direct relation between AspP-EM and an NP; the NP remains low within the VP. [The same fundamental approach can also be found in van Hout (2000) and Ritter and Rosen (1998, 2000)].

A telic interpretation is derived when an NP moves to/through the specifier of AspP-EM and activates the relevant aspectual properties. An atelic interpretation results when AspP-EM does not project a specifier and no aspectual properties are activated; no relation is established between the aspectual functional projection and an NP. This derives the AIN. Borer assumes that an NP in the specifier of AspP-EM receives the role of event measure (which is equivalent to incremental theme), and the event is measured out. In this respect, incrementality is intimately tied to the AIN, to a particular syntactic position. Finally, this account does appear to reflect the asymmetrical aspectual

contributions of CNs and MNs in as much as only CNs establish a (syntactic) relation with AspP-EM; MNs establish no relation with AspP-EM.

3.2.2. Borer and Two Relations with Two Functional Projections

In Borer (2005), when an NP possesses a particular aspectual property, which she refers to as quantity (a CN in our terms), defined mereologically, and it moves to the specifier of $Asp_{Q(uantity)}P$, establishing a checking relation with Asp_Q, the result is a quantity (or telic) predicate. When in the specifier of Asp_QP, the NP receives a subject–of–quantity interpretation via an entailment from event structure. With respect to MNs, they also have to move, although not to/through the specifier of Asp_QP; they move to/through a structurally equivalent functional projection. Atelicity does not result from a checking relation with this functional projection, but results from the lack of Asp_QP in the structure.

A telic interpretation results when Asp_QP is present in the structure, and a CN moves to/through its specifier and checks quantity (i.e. telicity). An atelic interpretation results due to the absence of Asp_QP. In its presence, there is a structurally equivalent functional projection, through which an NP passes. This is the AIN. Note that in both the telic and atelic cases, NP movement to/through the corresponding functional projection is assumed. In this respect, the aspectual contribution of CNs and MNs can be thought of as syntactically symmetrical. Finally, Borer assumes that a CN in the specifier of Asp_QP receives the interpretation of subject–of–quantity, a notion akin to event measure, or incremental theme; consequently, there is a tight relation between the AIN and incrementality.

3.2.3. MacDonald and Agree

MacDonald (2008a,b) assumes the existence of an aspectual projection, AspP with which NPs establish a relation. He assumes that NPs that give rise to telic predicates have a feature, akin to Verkuyl's [+SQA] feature which he labels [+q], and NPs that give rise to atelic predicates have a feature, akin to Verkuyl's [–SQA] feature, which he labels [–q]. No movement is assumed to have to take place for (a)telicity to arise. He claims that it is enough that these NPs establish a relation with AspP at a distance, via Agree.

The AIN is instantiated via an Agree relation with Asp. When a [+q]NP Agrees with Asp, a telic predicate results; when a [–q]NP Agrees with Asp, an atelic predicate results. This approach is symmetrical in the sense that both [+q] and [–q]NPs Agree with the relevant aspectual projection to give rise to telic and atelic predicates, respectively. In this account, there is no relation assumed between the presence of AspP, or the Agreement relation established with it, and incrementality; incrementality is independent of the AIN.

4. Summarizing Syntactic and Semantic Accounts of the AIN

Table 1 provides a summary of the syntactic and semantic approaches to the AIN just outlined and illustrates whether they provide an account of the three observations surrounding it.

Because both syntactic and semantic approaches to the AIN set out explicitly to account for the AIN, they all do so. Because the AIN is defined as an alternation between a telic and an atelic predicate, as the result of certain properties of NPs, initially it might seem that semantic accounts are more adequate, because they account directly for the semantic effects. However, it does appear that the semantics does depend to some degree on the syntax in the determination of the (a)telicity of the predicate, because the direct object NP must combine with the verb in order for it to exercise its aspectual influence. That is, the verb must merge with the direct object before the (a)telicity of a

Table 1. A summary of semantic and syntactic approaches.

	AIN	AIN-incrementality independence	Asymmetrical aspectual contribution of CNs and MNs
Semantic accounts			
Verkuyl	√	√	X
Krifka	√	X	X
Jackendoff	√	X	X
Piñón	√	X	√
Syntactic accounts			
Borer '94	√	X	√
Borer '05	√	X	X
MacDonald	√	√	X

predicate can be determined. Similar arguments can be found for PPs (see Tungseth 2005; MacDonald 2008b). Because some amount of syntax is needed before semantics can do its work, syntactic accounts to the AIN are not a priori precluded from properly accounting for the AIN. In fact, each of the syntactic accounts mentioned earlier assumes that syntax provides instructions to the semantic component for the correct aspectual interpretation. That is, the AIN takes place in the syntax, be it a configuration or be it feature checking, and the syntax resulting from the AIN is what the semantic component reads to calculate the aspectual interpretation of the predicate.

With respect to separating incrementality from the AIN, there is one semantic account and one syntactic account that do so: Verkuyl's and MacDonald's, respectively. As incrementality is tied to the lexical semantics of the verb, it might be natural to approach the separation of incrementality and the AIN via a syntactic account in the following way: the AIN is a relation with a functional projection; the lexical semantics of the verb is a property of the lexical category V. These are independent syntactic projections, which derive quite naturally the independence of incrementality and the AIN. Given Verkuyl's account, nevertheless, there is no immediate reason why incrementality and the AIN could not be independent as well. That is, incrementality could be a feature that is independent of his [ADD TO] feature, the relevant feature corresponding to the AIN. In this way, incrementality and the AIN could, quite naturally, be independent of each other in his semantic account as well.

With respect to the asymmetrical contribution of CNs and MNs, there is one semantic account and one syntactic account: Piñón's and Borer's '94, respectively. Piñón's account depends in part on the degree argument of incremental theme verbs, the two distinct operators that can discharge the degree argument, and, arguably most importantly, the quantized vs. cumulative nature of the NP. It is due to the semantics of quantizedness and cumulativity that the two operators have the effect they do. Borer's account depends on one basic assumption: telicity arises via a relation established between an aspectual functional projection and a CN; when no relation is established with this aspectual functional projection, whether in the presence of a CN or in the presence of a MN, atelicity arises.

Based on the three initial observations regarding the AIN, semantic and syntactic approaches to the AIN fair equally well. That is, from these three observations, it is not clear whether it is best to approach the AIN as a syntactic or a semantic phenomenon. Let us consider one final observation surrounding the AIN, which might offer some insight into the question: its non-universal nature.

5. The Non-Universality of the AIN

As Schoorlemmer (1995) observes for Russian, direct object NPs do not influence the aspectual interpretation of the predicate. This is illustrated in (11).

(11)   a.   *Mary čitala knigu/poèziju *za čas/v tečeniji časa.*
                    Mary read-IMP book/poetry *in hour/during hour
                    'Mary read a/the book/(the) poetry in an hour/for an hour'.
    b.   *Mary pročitala knigu/poèziju za čas/*v tečeniji časa.*
                    Mary read-PERF book/poetry in hour/*during hour
                    'Mary read a/the book/the poetry for an hour'.

The imperfective form of the verb in (11a) is atelic (although not all imperfective forms are atelic, as noted, for instance, by Borik 2002) and the perfective form of the verb in (11b) is telic (although not all prefixed perfective forms are telic, as noted, for instance, by Schoorlemmer 1995), independently of whether there is a CN or a MN direct object. Strictly speaking, the noun does not have an aspectual influence on the predicate. That is, there is no AIN in Russian. [From similar observations in Ramchand (1993), one could conclude the same about Scottish Gaelic.]

There is no AIN in Russian, but there is evidence for incrementality. Braginsky and Rothstein (2008) argue explicitly that there are verbs in Russian – cutting across the perfective/imperfective distinction – that have incremental structure. They take the (in)compatibility with *postepenno* 'gradually' as a test for (the lack of) incremental structure and offer the contrast between *(pro)čitat'* 'read' and *(po)guljal* 'walk' as evidence that the former has incremental structure, while the latter does not. This is illustrated in (12a) and (12b), respectively, from Braginsky and Rothstein (2008:13) (although I have collapsed their four examples into two).

(12)   a.   Ivan postepanno (pro)čital knigu.
                    Ivan gradually   (pro)read book.
                    'Ivan gradually read (a)/the book'.
    b.   *Ivan postpepanno (po)guljal.
                    Ivan gradually   (po)walked
   'Ivan gradually walked (for a while)'.

There is evidence for incrementality in Russian, although Russian lacks the AIN. That Russian lacks the AIN, while it still has incremental (theme) verbs is not unexpected, because we have already seen evidence that incrementality and the AIN are independent of each other.

Now, if Russian lacks the AIN, can we speak of an asymmetrical aspectual influence of CNs and MNs in Russian? It is not immediately clear that we can, at least not in precisely the same way that we can for English, since there is no aspectual influence of the noun at all in Russian. Nevertheless, we can talk about the aspectual influence of the verbal predicate on the interpretation of the noun. It has been noted for Russian that telic predicates impose an interpretation on their NP direct objects akin to a quantized/[+SQA]/quantity noun interpretation, i.e. our CN interpretation. In fact, some have suggested (see, for instance, Krifka 1992; Filip 2000) that this imposition is essentially the inverse of the AIN; that is, instead of the aspectual influence of the noun on the predicate, there is an aspectual influence of the predicate (AIP) on the noun. If

there is an AIP in Russian, which is the inverse of the phenomenon observed in English, there may very well be an aspectual asymmetry as well. In fact, there does appear to be one. As explicitly discussed in Borer (2005) (and references therein), while a telic predicate unambiguously gives rise to a CN interpretation of a direct object NP (e.g. *the poetry* in 11a), an atelic predicate can give rise to either a CN (e.g. *a book* in 11b) or a MN interpretation of a direct object NP (e.g. *poetry* in 11b). Like the AIN, the AIP also shows an asymmetrical aspectual influence. These aspectual asymmetries are illustrated in (13).

(13) Telic predicate   Atelic predicate

Count noun   Mass noun
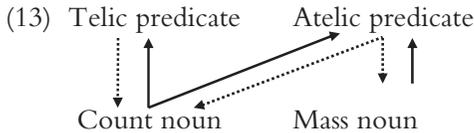
The solid lined arrows represent the situation in English in which we find the AIN, where the direction of influence is from the nominal domain to the verbal domain. The dotted lined arrows represent the situation in Russian where we find the AIP, where the direction of aspectual influence is from the verbal domain to the nominal domain. Note that the directionality (itself) of aspectual influence is independent of the aspectual asymmetry. That is, if we remove the directionality, represented by the arrows, there is no way to distinguish the AIN from the AIP, yet the asymmetry remains. This is illustrated in (14).

(14) Telic predicate   Atelic predicate

Count noun   Mass noun
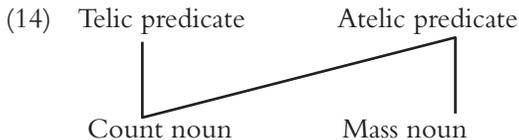
The asymmetry, in terms of illicit combinations between verbal predicate types and NP types, reduces to the lack of telic predicates with MNs. This combination is illicit in both English and Russian, independently of the direction of aspectual influence. This independence of the aspectual asymmetry from the directionality of aspectual influence is one point where Borer's syntactic approach to the aspectual asymmetry appears to be more adequate than Piñón's semantic approach. Let us see why.

Crucial to Piñón's asymmetrical account is the influence of the cumulativity vs. the quantizedness of an NP. Due to the semantics of NP quantizedness – in combination with the semantics of the two degree argument discharging operators – both a telic (quantized) and an atelic (cumulative) interpretation of the predicate is available; and due to the semantics of NP cumulativity – in combination with the semantics of the two degree argument discharging operators – only an atelic (cumulative) interpretation of the predicate is available. Now, because verbal predicates are also treated in terms of quantizedness and cumulativity, there is no reason why the semantics of VP quantizedness (i.e. a telic predicate) does not allow for both a CN (quantized) and MN (cumulative) interpretation of the NP. However, this is not the case, because a telic predicate with a MN direct object is the illicit combination, as illustrated in (14). The problem arises because in Piñón's account, the direction of aspectual influence, from the nominal domain to the verbal domain, plays an important role.

In Borer's syntactic account, in the presence of a CN direct object, there is a telic interpretation of the predicate only if the CN moves to/through the specifier of AspP-

EM. This directly accounts for the lack of telic predicates with a MN direct objects, because MNs do not move to/through the specifier of AspP-EM, only CNs do. Moreover, in the absence of (the specifier of) AspP-EM, there is nothing to preclude the presence of a CN or MN direct object, because neither has to establish a relation with any particular functional projection to give rise to an atelic interpretation of the predicate. There is no dependency on the directionality of aspectual influence in Borer's system. A telic predicate arises as a result of a syntactic configuration, and an atelic predicate arises a result of the absence of this configuration. (In Borer 2005, this aspect of the analysis is the same.)

6. A Final Complexity: Telicity Without NPs

Given the current range of syntactic and semantic accounts of the AIN, whether the AIN is a syntactic or a semantic phenomenon appears to come down to which account can handle the asymmetrical aspectual influence more adequately from a cross-linguistic perspective. From this point of view, there may be reasons to conclude that the AIN is best thought of as a syntactic phenomenon. This is not to deny that current semantic models could not be tweaked accordingly to handle the relevant range of observations surrounding the AIN. However, as proposals currently stand, syntax seems to be the most appropriate location for the AIN. If this is so, however, consider one final complexity for syntactic approaches that crucially rely on a CN direct object for deriving the telicity of a predicate: telic predicates in the absence of any direct object. Examples can be found in both English and in Russian. The English examples in (15) and (16) are from Harley (2005: 46) and Borer (2005: 203), respectively. The Russian examples in (17) are from Borer (2005: 185) who cites Schoorlemmer (2004) as the source. (In 17 superscript P stands for perfective.)

(15)   a.   The mare foaled   #for 2 hours/in 2 hours.
       b.   The dog whelped   #for 2 hours/in 2 hours.
       c.   The cow calved   #for 2 hours/in 2 hours.

(16)   a.   The army took over (in two hours).
       b.   The catcher wanted the pitcher to pitch out (in two-seconds) and see if they
            could catch the runner stealing.

(17)   a.   Ja morgnula^P (*casami).
            I blinked   (*for hours)
       b.   On kriknul^P za minutu (*casami).
            He shouted in minute   (*for hours)

These data are an added complexity for any account of the telicity of a predicate, be it syntactic or semantic, that crucially relies on the presence of a CN direct object to derive a telic interpretation, because there appear to be predicates that can be telic independently of the presence of a CN direct object. Although the AIN is a phenomenon intimately tied to the (a)telicity of a predicate, the (a)telicity of a predicate is a phenomenon that extends beyond the AIN.

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Note

* Correspondence address: Departament de Filologia Espanyola, Facultat de Lletres, Edifici B, Universitat Autònoma de Barcelona, 08193 Bellaterra, (Barcelona), Spain. E-mail: macdonald.jon@gmail.com

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