Verb Aspect and Prototype Theory

Antony Galton,
Department of Computer Science,
University of Exeter,
Exeter EX4 4PT, U.K.

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1 Aspect and aspectual categories

Verb aspect is a phenomenon of widespread occurrence and considerable variability in the world's languages (see, e.g., Comrie, 1976; Dahl, 1985). In English its main manifestation consists of two grammatical oppositions, that between the simple and continuous forms of the verb, as in *I eat* vs *I am eating*, and that between the simple and perfect forms, as in *I eat* vs *I have eaten*. English allows the perfect form to combine with the continuous, to produce *I have been eating*. The forms illustrated here are in the present tense. In addition, each of them may occur in the past: *I ate/was eating/had eaten/had been eating*. Although both tense and aspect have to do with temporal features of meaning, aspect is normally regarded as quite separate from tense: where tense is concerned with the location of a state or event in time, aspect is concerned more with its temporal 'shape', either intrinsically or from a particular point of view.

What makes these grammatical features aspectual is the fact that they make a particular kind of contribution to the meanings of the sentences in which they occur. An adequate theoretical account of aspectual phenomena should characterise the nature of these contributions. Aspect has, in fact, been the subject of much study in linguistics, both conventional and computational, and a loose consensus seems to have emerged that an adequate account of it should look somewhat as follows. A verb phrase describes a 'situation' or 'eventuality' (the terminology is notoriously slippery) of a particular type, and its grammatical aspect then modifies this by converting it into a different type. This gives us two aspectual notions, *primary aspect*, which concerns the classification of the situation-type denoted by the bare (uninflected) verb phrase, and *secondary aspect*, which refers to the transformations of situation-type resulting from the grammatical modifications of the verb[1].

This distinction is primarily a semantic one, but it tends to be reflected syntactically too, and in various different ways. In fact, the distinction itself is sufficiently unclear that the means of syntactic expression may be the best guide we have to drawing the boundary satisfactorily. Thus when aspect is expressed lexically, as with the distinction between *travel* (durative—i.e., referring to something which takes time) and *arrive* (punctual—i.e., referring to an instantaneous event), or contextually, as with *eat a boiled egg* (telic—i.e., with a built-in termination point) and *eat scrambled egg* (atelic—i.e., with no built-in termination), we call it inherent or primary aspect, but when it is expressed morphologically, as with *eat* vs *be eating* (indicating an action in progress) vs *have eaten* (indicating a completed action), we call it imposed or secondary aspect. But these syntactic distinctions are

[1]What we here call primary aspect has been variously referred to in the literature as *Aktionsart*, inherent aspect, or aspectual character.

themselves not always clear: for example, is the distinction between perfective and imperfective verbs in Slavonic lexical or morphological? At the semantic level, this amounts to asking whether the perfective/imperfective distinction in Slavonic expresses primary or secondary aspect.

The detailed articulation of the picture that has been sketched will require a classification of situation-types and aspect-types. Verkuyl (1989) has given a well-nigh exhaustive survey of the situation-type classifications that have appeared in the literature. Ultimately it seems that the fundamental choice we are faced with is between

- a *dichotomy* into 'states' and 'events', or
- a *trichotomy* into 'states', 'processes', and 'events'.

A dichotomist will have somehow to incorporate the 'processes' of the trichotomist into one of the other two classes. The more popular alternative is to regard processes as a kind of event, although I have argued that they should rather be thought of as a kind of state (Galton, 1984). As a matter of fact, I believe that there are cogent arguments for both positions, and this, if true, would seem to favour the trichotomists. What makes all this particularly hard is the fact that whatever categorization one comes up with, it always seems possible, given sufficient ingenuity, to discover anomalies which don't fit the classification. This is where prototype theory comes in.

2 Prototype theory

Prototype theory stems largely from the work of Eleanor Rosch, but has been championed by many others in linguistics, cognitive science, and psychology, most conspicuously by Lakoff (1987). It is an attempt to break the mould of traditional assumptions about categorization. The traditional view, it is claimed, is that categories are defined in terms of necessary and sufficient conditions for membership, and correspond to objective discontinuities in reality. Prototype theory claims that, in contrast, most categories cannot be defined in terms of necessary and sufficient conditions (there may well be both necessary conditions and sufficient conditions, but these will not in general coincide), and they correspond to the organization of our mental conception of the world rather than to the objective nature of the world itself. A category, according to this theory, will typically consist of, first, a nucleus of central or prototypical members which are characterized by the possession of some list of salient attributes; and second, various more or less non-central or peripheral members which owe their membership of the category to their sharing some, but not all, of the salient attributes of the prototypical members. In some cases, it may even be possible for something to belong to a category by virtue of attributes shared with non-central members of the category only.

As an example, consider the term 'leaf'. What is a leaf? A prototypical leaf is an essentially two-dimensional, more or less flat appendage, roughly ellipical in outline and green in colour, attached to a tree or bush by a short stalk. Some such image as this is what comes most readily to mind when we think of a leaf. By removing one or more, but not too many, of the salient attributes listed above we can obtain leaves which are close to the prototype, without being prototypical themselves. They are things which we will readily admit to be leaves, even though they are not the first things that come to mind when leaves are mentioned. There are non-green leaves such as those of the copper beech, leaves with far from elliptical outlines such as those of oak, sycamore, ash, or holly. There are leaves that are three-dimensional such as the fleshy leaves of various succulents, or linear and stalkless like pine-needles and blades of grass. Here we are getting rather far from the prototypical leaf, but we can go even further by including various more or less metaphorical uses of the term 'leaf', as in the leaf of a table, the leaves of a book, or gold leaf. The last case is particularly interesting in that the word 'leaf' is being used as a mass noun rather than a count noun.

The contrast between the kind of category that is postulated by prototype theory and the classical conception of a category, as defined in terms of necessary and sufficient conditions for membership, can be brought out by contrasting our everyday notion of a leaf, which exhibits prototype effects as discussed above, with the technical use of the term 'leaf' in botanical science[2]. For the botanist a leaf can be defined in terms of necessary and sufficient conditions: essentially, the category of botanical leaf—or 'true leaves'—is an equivalence class under the relation of phylogenetic homology. For this reason, the two-dimensional, more or less elliptical, flat, greenish appendages of many Australian wattles (*Acacia* spp.) are classed not as leaves but as *phyllodes*, notwithstanding the fact that they look like leaves, and function like leaves—and indeed, to the layman they simply *are* leaves. Conversely, there are 'true leaves' which are strikingly unleaflike—for example, the spines of cacti; botanists are inclined to call these 'modified leaves', which certainly makes them sound more leaflike than the phyllodes of *Acacia*, even though to the layman they are considerably *less* leaflike than the latter, in fact not leaflike at all.

We have listed many things which count as leaves in our folk categorization. The claim of prototype theory is that even if, as seems unlikely, we could find a necessary and sufficient condition of the form 'X is a leaf iff . . . ', this would still not account for the fact that some examples of leaves seem to us to be more central than others, and that this so-called 'radial organization' of the category 'leaf' plays a significant role in our thinking. For example, if someone says 'there are dead leaves all over the lawn', it would not occur to me to understand this to mean that the lawn is covered with grass cuttings, because while blades of grass are indeed leaves, they are rather non-central examples of the category—I should rather assume that what is on the lawn is leaves fallen from trees.

3 Salient attributes for aspect

In this section and the next two we shall use prototype theory as a framework within which to systematize the phenomena of aspect in English. In aspect theory we are concerned with properties such as

- durativity — does the situation last over a period of time?
- telicity — does the situation have a built-in termination?
- unitarity — is the situation viewed as a single whole?
- agentivity — is the situation viewed as an action?

Which of these properties does a prototypical 'situation' possess? My inclination is to say 'all of them'; that is, a prototypical situation is agentive, telic, durative and unitary, i.e., it is a single end-directed action which takes time. This description certainly covers the standard, rather unproblematic examples routinely discussed by students of aspect, such as[3]

John eats a pizza
Mary writes a letter
Jane swims a length

[2] Cf. the distinction between *folk categories* and *expert categories* discussed in Taylor (1991), §4.3.

[3] I adopt the convention of using the simple present tense to represent the 'bare' verb phrase unmodified by any secondary aspect. It should be borne in mind, though, that in some contexts the simple present does involve secondary aspect, e.g., when it has a habitual reading.

If these are the prototypes, then to get examples of situations that are close to the prototype but not themselves prototypical, we may remove one of the salient attributes. Some examples are

- Not telic: *John eats, Mary writes, Jane swims*
- Not durative: *Jane starts swimming, John blinks*[4]
- Not unitary: *John eats pizzas, Jane swims lengths*
- Not agentive: *The tree falls down, The ice melts*

Since (secondary) aspects apply to situations, it seems reasonable to define their prototypical meanings in terms of the attributes of prototypical situations; these prototypical meanings will themselves be characterized in terms of a list of salient attributes. This will give us two ways of discovering non-central meanings of the aspects: by considering what happens to the prototypical aspects when we try to apply them to non-prototypical situations; and by considering possible deviations from the prototypical aspects themselves.

4 The Progressive

The prototypical meaning of the progressive can be explained as follows. Suppose the (uninflected) verb-phrase VP refers to a telic, durative, unitary action A. Then the progressive form of VP, which we may denote Prog(VP), will refer to a state of affairs in which the agent is currently engaged in activity that is intended to form part of the eventual completion of an action of type A. Examples are

John is eating a pizza
Mary is writing a letter
Jane is swimming a length

The prototypical interpretation of these examples is that, for example, John is currently engaged in the activity of eating a pizza, that is, he is putting portions of the pizza into his mouth one after another, chewing and swallowing them, and he intends to continue doing this until the pizza is all gone. The salient attributes of an interpretation of this kind are:

- The activity is actually happening
- There is an intention that it should continue to the end

By dropping one or other of these attributes we get variations on the prototypical meaning of the progressive.

First, the activity need not be actually happening. Either

- it has been interrupted[5]: e.g., while I am having supper, the telephone rings, I get up to answer it; during the conversation that follows I am asked what I am doing, and I say *I am having supper*; or

[4]These examples respectively illustrate the two ways in which a situation can fail to be durative: it can be literally instantaneous, in that it marks the boundary between two extended periods, or it can be 'momentary', i.e., it has a duration that is so short as to be perceptually indivisible.

[5]This is what I have elsewhere called the 'broad' sense of the progressive (Galton, 1984).

- it hasn't started yet: the progressive in this case might merely record a present intention for the future, as in *I am driving to London tomorrow*, or it may retain the idea of an activity that contributes to the eventual completion of the event, without insisting that it forms part of it—in other words, the agent is engaged in an activity that in some way prepares for the occurrence of the event, as when one might say *I am making a cake* while shopping for ingredients or getting them out of the pantry[6].

Note that the third way in which an activity can fail to be actually happening, namely by having finished, is unavailable here as this would be incompatible with the existence of an intention that it should continue to the end.

Second, the intention of the agent is not invoked. Instead, the use of the progressive is justified by the knowledge that the activity did in fact get to be completed. This can only be used for past tense sentences, because only in these cases is the knowledge of completion available: *When Beethoven was writing the Eroica, ...*[7]. In all these cases, because the situation involved is a telic event, there is an important contrast between the non-progressive and the progressive forms, since the former entails the completion of the event, the latter merely entails an activity directed in some way towards that completion. So there are situations that *John is eating a pizza* applies to but *John eats a pizza* does not: namely those in which John starts eating a pizza but doesn't finish it. This has been called the 'imperfective paradox', though it is, surely, hardly paradoxical!

So far we have only considered variations on the progressive as applied to prototypical situations; but we may also consider applying it to non-prototypical situations.

First, suppose the action is not telic. In this case, there cannot be an intention that it should continue to the end, only that it should continue. The contrast between stopping short of the end and continuing to the end becomes neutralised here, so that, e.g., *John ate* and *John was eating* apply to the same situations, differing only in the 'narrative focus' that they bring to bear on those situations (the former treats the situation as an event, the latter treats it as a kind of state). So the 'imperfective paradox' does not arise for atelic situations.

Second, suppose the action is not durative. In this case there is no activity that can form part of the action, nor can the action be interrupted; hence the natural interpretation of the progressive here is that an agent intends that the event will occur in the future, or is actively engaged in preparing for it (as in the futurate progressive), e.g., *I'm leaving*, said by someone putting his coat on in readiness to go.

Third, suppose the action is not unitary. Here we are dealing with inherently 'interrupted' situations, so it is very natural for something like the 'broad' sense of the progressive to apply. This gives us the frequentative sense of the progressive: *John is eating pizzas*, *Jane was swimming lengths all morning*. In these cases the non-unitary character of the action is explicitly marked by the plural inflection on the object; but it can also be implicit, as in *Someone is knocking at the door*, which would normally be taken as referring to a sequence of knocks; when a situation is neither telic, durative, nor agentive, there remains nothing to support either a prototypical or futurate reading of the progressive, and we are then practically forced to adopt a frequentative reading: *John is coughing*, *The light is flashing*.

Fourth, suppose the event is non-agentive. The process must therefore derive its end-directedness from some source other than the intention of an agent. Possibilities are

- the closed progressive, discussed above (e.g., *When Vesuvius was erupting, ...*);

[6]This has been called the 'futurate' progressive in the literature.

[7]This is the 'closed' sense of the progressive (Galton, 1984).

- a mechanism, as in *Your money is being counted*, displayed at an "autobank" terminal;
- bare physical causality: *The tree is falling down* [8].

5 The Perfect

The prototypical meaning of the perfect can be explained as follows. Suppose the (uninflected) verb-phrase VP refers to a telic, durative, unitary action A. Then the perfect form of VP, which we may denote Perf(VP), will mean that some state of affairs that is consequent upon the actual completion of an action of type A still obtains. Examples are

John has eaten a pizza
Mary has written a letter
Jane has swum a length

The states of affairs referred to in these examples are, for example, that John is now ready to move onto the next course (or he is too full for the salad he is being offered, etc.), that there is a letter by Mary ready to be posted, or already on its way, and that Jane is now at the other end of the swimming pool.

The salient attributes of this way of reading the perfect are that

- The action is complete
- The result is a state which is specifiable independently of the action but which is directly caused by it.

Non-prototypical senses of the perfect can be derived by dropping or modifying these attributes.

First, the action is not complete. For a telic action, this can only be the case if the verb is in the progressive form, e.g. *Mary has been writing a letter*. In this case the result state is not the existence of a letter, but the existence of part of a letter; note that while the progressive does not imply completion, it does not necessarily imply non-completion, so the 'part' may in fact be the whole thing (e.g., *Mary has been writing a letter; now she's going to post it*).

Second, the result may be not specifiable independently of the action. To say *Jane has swum a length* does not necessarily imply that she is still at the other end of the pool (e.g., *Jane has swum a length, and now she's swimming another one*): it could merely mean that she has that achievement to her credit. This 'experiential' sense of the perfect occurs quite frequently: typically, the question *Have you been to Russia?* does not ask whether some independently specifiable state consequent on a visit by you to Russia still obtains, but only whether you number a visit to Russia amongst your experiences. In this experiential sense, strictly interpreted, once the perfect applies, it always applies, so that if I can ever truly say that I have been to Russia, then it will remain true from then on that I have. This is not always the case, though: for example, *I've had lunch* remains true from the time I finish lunch until the end of the day; next day it is false again until after lunchtime. This is a 'bounded experiential' sense; it is very common when the perfect is accompanied by an *in* or *for* adverbial, e.g., *I have coughed once in the last hour, I haven't seen Jane for two weeks*.

Again, the 'result' may amount to no more than a continuing relevance of the fact that the action has been completed—*I've had lunch* is perhaps understood more often as referring to the state of my

[8] The three cases of intention, mechanism, and causality correspond to Dennett's three stances that we may adopt towards a system: the intentional stance, the design stance, and the physical stance (see Dennett, 1987).

not being ready for another meal than in the 'bounded experiential' sense mentioned above. If this state can be spelt out in terms of my digestive processes or whatever, then we are getting very close to the prototypical case of a direct causal link. Another kind of 'result' that is not independently specifiable is *recency*, as in *I've just seen Mary*.

Third, the result may be not directly caused by the action, i.e., the causation is indirect. (The 'not independently specifiable' senses discussed above cover the cases where it is not 'real' causation.) If a man sets in motion a chain of events which results in a woman dying, say, then we might say *He's killed her*; but the state referred to (i.e., the woman's being dead) is only indirectly the result of the action which we describe as his killing her. Normally *He's killed her* would be taken to imply something more direct like an immediately fatal stabbing or shooting. (There is a lot of discussion of this sort of thing in the philosophical literature; we can't go into it here.)

We have mostly concentrated on prototypical situations in the above discussion. Non-prototypical situations do not introduce many new features. The only additional point worth mentioning is that if the situation is atelic, then the distinction between stopping and completing is neutralised, so completion ceases to operate as a salient attribute. This links in with an observation by Aristotle that whereas with a telic situation, the perfect is inconsistent with the progressive, e.g., if I have eaten a pizza, then I can't still be eating it, with an atelic situation this incompatibility no longer obtains, so it is quite possible for me to have laughed, say, and to be laughing still. (These are not Aristotle's examples!)

6 Conclusions and related work

We have demonstrated that, both for the progressive and for the perfect in English, there exists a family of senses that can be regarded as variations on a prototypical meaning as applied to prototypical situations. They are derived from the prototype by dropping or in some way altering one or more of its salient attributes, as regards either the primary or secondary aspect. Our discussion has not unearthed any new individual facts about English aspect; rather, our purpose has been to develop a perspective, within a particular theoretical framework, that accounts for the known facts in as concise and elegant a way as possible, given the rather various nature of those facts.

The application of prototype theory to syntactic categorization is not new, and has indeed received extensive discussion in the recent literature. Some examples close to our present concern are, first, the discussion of the past tense in Taylor (1991), §8.2, second, prototype-based accounts of the subjunctive mood in Spanish (Lunn, 1989) and French (Winters, 1989), and third, the classification of 'possible verbs' by Croft (1990). Croft takes as prototypical a structure designated *causative-inchoative-stative*, which is related to an idealized cognitive model (ICM) for "simple events". This is reminiscent of our prototypical durative, telic, unitary actions, and is also related to the three-fold event nucleus discussed by Moens and Steedman (1988).

Dahl (1985) explicitly invokes the notion of a prototype in his cross-linguistic survey of tense and aspect categories, but he does not attempt to map the radial structure of any single aspectual category explicitly in the way outlined here.

Langacker (1991) has an extensive discussion of aspect in the context of Cognitive Grammar. This enterprise owes much of its inspiration to prototype theory, yet Langacker's work on aspect seems to go against the spirit of that theory in that it seeks to characterize each aspectual category monolithically in terms of a single overarching (and of necessity highly general) description, or *schema*[9]. It is noteworthy in this respect that none of the numerous entries under the heading

[9]See Taylor (1991), §4.2, for a discussion of the relative merits of prototypes and schemas.

‘prototype’ in Langacker’s index refers to the chapters on the auxiliary, in which aspect is discussed.

The procedures sketched in the previous section bear some resemblance to the phenomena of ‘coercion’ discussed by Moens and Steedman (1988). It is probable that prototype theory can provide the basis for an explanation of why coercion phenomena occur.

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