

Verbal Nouns and Event Structure in Scottish Gaelic

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Background to Scottish Gaelic

The verbal noun in Scottish Gaelic is interesting because it appears in a substantial proportion of purely verbal predications as well as being the standard way of expressing event nominals in the language. This paper is an attempt to arrive at some semantic generalizations about the systematic contributions of the verbal noun to the aspectual interpretation of predicational phrases, and to do so in such a way as to reconcile its use in the nominal contexts as well.

As a starting point, some background to the linguistic structures of Scottish Gaelic (henceforth SGaelic) is necessary. SGaelic is a VSO language, which means that the tense carrying verb is always the first element in a sentence (even those within subordinate clauses). The subject comes immediately after this tensed element, followed by the object and any adjuncts. Consider the following sentences in Scottish Gaelic. 'Periphrastic' tenses have a tense-carrying auxiliary while the 'simple' tenses do not.

- (1) a Chunnaic Calum am balach.
 See-PAST Calum the boy-DIR
 "Calum saw the boy."
 b *Chunnaic Calum a'bhalaich.
 See-PAST Calum the boy-GEN
 "Calum saw the boy."
- (2) a Bha Calum air am balach (a) fhaicinn.
 Be-PAST Calum 'air' the boy-DIR 'a' see-VNOUN
 "Calum had seen the boy."
 b *Bha Calum air a'bhalaich (a) fhaicinn.
 Be-PAST Calum 'air' the boy-GEN 'a' see-VNOUN
 "Calum had seen the boy."
- (3) a Bha Calum a' faicinn a'bhalaich.
 Be-PAST Calum 'ag' see-VNOUN the boy-GEN
 "Calum was seeing the boy."
 b *Bha Calum a'faicinn am balach.
 Be-PAST Calum 'ag' see-VNOUN the boy-DIR
 "Calum was seeing the tree."

In addition to the existence of a separate tense carrying auxiliary, the periphrastic tenses also carry an explicit aspectual particle. In the case of the progressive this particle is *ag*, often written as *a'*, and in the perfect, this particle is *air*. Objects alternate between Genitive and Direct case, and between pre-verbal and post-verbal position. The Direct case is the morphological case form found on both subjects and objects in SGaelic; there is no difference between morphological nominative and accusative, even in the pronoun paradigm. The simple past (1) and the perfect periphrastic (2) both contain Direct case marked objects, while the progressive periphrastic contains a Genitive marked object (3). The perfect periphrastic has a pre-verbal Object, whereas the progressive periphrastic has a post-verbal Object. The (b) sentences in the examples above show that changing the case marking on the object results in an ungrammatical sentence.

The following ungrammatical examples show that any attempt to change the word order of the verbal noun and the object for the different aspectual particles gives ungrammatical results.

- (4) *Bha Calum air faicinn a'bhalach.
 Be-PAST Calum 'air' see-VNOUN the boy-GEN
 "Calum had seen the boy."
- (5) *Bha Calum ag am balach faicinn.
 Be-PAST Calum 'ag' the boy-DIR see-VNOUN
 "Calum was seeing the boy."

The periphrastic construction in SGaelic has been the subject of some controversy in the Celtic grammatical tradition. The main issue has been the status of the verbal noun in such constructions, and whether it should be thought of as a noun or a verb. The case marking on the object in the periphrastic progressive is one of the main phenomena cited as indicating the basic noun-hood of the verbal noun, since this is the form that modifiers of nominals show up in elsewhere in the language. However, McCloskey (1984) has clearly shown for Irish that the projection headed by the aspectual particles and containing the verbal noun is unambiguously a verbal one.

The problem of identifying the categorial status of the verbal noun is a difficult one, and, given the close relationship between verbs and event nominals in other languages, a deep and non-trivial one. In SGaelic the problem is inseparable from the issue of what the relationship is between the verbal noun and the tense and aspect morphology it appears with in the constructions where they all appear in different places in the phrase structure.

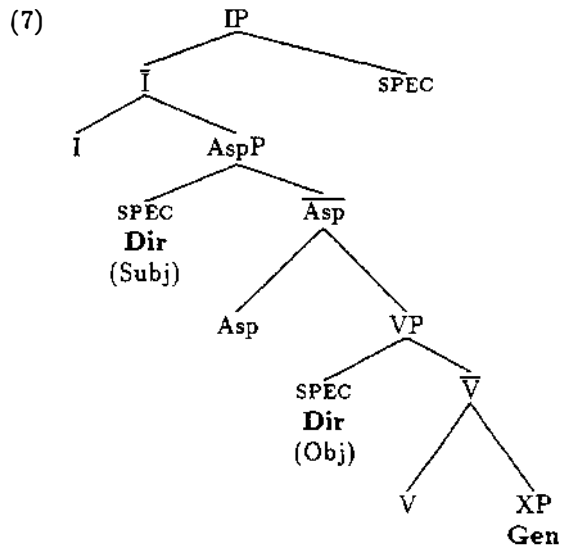
The verbal noun in SGaelic is also the form used in the nominal expression of events, where it has the distribution of NPs in the language.

- (6) Tha gearradh na craoibhe aghaidh an lagha
 Be-PRES cut-VERBAL NOUN the tree-GEN against the law
 "The cutting of the tree is against the law."

Specifically the verbal noun in this language presents a challenge for both categorial notions in syntax and for compositional theories of semantics if we wish to give a unified account of the verbal noun as it is used both in predicational structures and explicitly nominal ones.

Aspect Phrase: Syntax

For the purposes of this paper, I assume that the aspectual particle, the verbal noun and the tense-carrying verb all represent heads of different projections. Crucially this involves the introduction of an explicit Aspect Phrase projection in the syntax. I have argued elsewhere (Ramchand (1992)) based on the phenomenon of distinct object positions, the existence of object marking, and some evidence from clefting that there is a cluster of syntactic behaviours that would be intelligible if we admit the existence of the projection, Aspect Phrase (AspP) in this language. The skeletal phrase structure I will be assuming here looks like the following.



I will assume that in SGaelic, government is only from left to right, as one would expect from a head-initial language. Moreover, following Chung and McCloskey (1987), I will assume that in these languages the head can

govern the SPEC position of its complement. In particular, this means that I can govern SPEC of AspP, and that Asp can govern SPEC of VP. The only position that the V can govern is the complement position to the right of it.¹

When the object is in the 'direct' case, it is actually in the SPEC of VP position governed by Asp, but when it is in the genitive case, it is the direct complement of , and governed by, the verbal noun.

Another important fact goes along with the difference in object position here. The pre-posed direct case marked object can be interpreted as completely affected, whereas the post-posed genitive may never be (see Ramchand (1992) for relevant data). This correlation also needs to be accounted for in any semantic account of these predicational structures.

An Aspectual Decomposition of the VP

In attempting to isolate the individual semantic contributions of the aspectual head and the verbal noun, we must turn to the extensive semantic literature on aspect and aspectual classification. Unfortunately, most semantic analysis to date has focused on aspectual classification at the level of the VP and at the sentence-level. Since we are dealing in this language with a difference in object position and interpretation that goes along with the aspectual differences, we need a theory that will separate out the contributions of the verb and direct object, while giving us a way of characterizing aspectual differences. However, there are a couple of semantic frameworks that have concentrated on precisely this issue. These are Krifka (1989) and Verkuyl (1992). In the interests of space, I will briefly summarize just one of these semantic frameworks, that of Verkuyl (1992) and conclude with an inventory of the different semantic factors that it allows us to isolate. The purpose will then be to determine a mapping between these semantic components and the particular syntactic and morphological devices found in SGaelic.

The semantic framework found in Verkuyl (1992) is called PLUG+. I will outline some of its general properties and intuitive insights here in what follows. The reader is referred to Verkuyl (1992) for more detailed discussion

¹The change in the position of the direct object is an interesting factor here. There has been a considerable amount of work done recently on derived objects and what their putative landing site must be. Many linguists seem to agree that there must be an A-position in the phrase structure to which the object may move (Massam (1985), Mahajan (1990), Sportiche (1990)) although they disagree as to what position this is precisely, and where it appears in the phrase structure. In her paper on 'derived' objects, Travis (1991) argues that there is a landing site for derived objects within the VP, which is the SPEC position of the functional projection Aspect Phrase. The Austronesian evidence points to the additional functional projection lying in between the VP-internal subject and the other verbal arguments. Moreover, the semantics of derived objects in these and other languages is correlated with perfectivity and specificity, and this is what motivates the label of Aspect for the needed functional projection.

and internal motivation.

The system of PLUG+ incorporates a number of unconventional ideas which are crucial to the ability of the system to relate the time structure of the verb to the denotations of its NP objects. The central idea is that of a 'partition'. The denotation of an NP is seen as the set of all collections of sets, such that each collection of sets forms a partition of the NP into non-overlapping portions, the union of which constitutes the whole of the NP.

NPs are distinguished according to whether the cardinality of the collection is determined or not. It is this distinction, represented by the existence of a determinate measure provided by the noun phrase that is given the label [+SQA] by Verkuyl, '+Specified Quantity of A'. It is precisely the NPs which are [+SQA] in this sense which give rise to telic interpretations in accomplishment sentences, and it is the [-SQA] NPs that give rise to non-bounded or atelic readings.

The second important component of this theory is the way in which the verb phrase is encoded. The general idea is to give the verb phrase a time index variable i , which represents a discrete moment in ordered time, homomorphic with the set of natural numbers. This is a kind of 'intensionalizing' of the verb phrase, since the actual denotation of the VP varies with the value of this extra variable. However, the value of the index does not represent a different possible world, but rather a different conceptual 'moment' within the event represented by the verb phrases. If the number of values of the variable i is finite and bounded, then the number of conceptual moments in the event is finite and bounded and the event will be construed as being telic. If on the other hand, the number of moments i at which the VP must be interpreted is undetermined, then there will be no bound on the event and it will be construed as being atelic.

We have two main components, then, the partitioning of the NP into a collection of sets, and the extra time variable i introduced in the denotation of the VP. The individual sets of the partition of the NP are mapped onto the time index in such a way that W_i maps onto i_i , if W_i is being 'verb'-ed at i_i . This set of time-partition pairs forms an abstract 'path' which is the meaning of the VP. The phrase structure rules in this theory are as follows.

1. $S: \lambda I. \llbracket NP \rrbracket (\lambda X. \llbracket VP \rrbracket (I)(X))$ $\Leftarrow NP: \llbracket NP \rrbracket, VP: \llbracket VP \rrbracket$
 2. $VP: \lambda X. \llbracket V_1 \rrbracket (X)$
 $VP: \lambda I \lambda X. \llbracket NP' \rrbracket (\lambda i \lambda Y. \llbracket V_2 \rrbracket (I)(i)(Y)(X))$ $\Leftarrow V_2: \llbracket V_2 \rrbracket, NP': \llbracket NP' \rrbracket$
 3. $NP': \llbracket \Theta \rrbracket (\llbracket NP \rrbracket)$ $\Leftarrow \Theta: \llbracket \Theta \rrbracket, NP: \llbracket NP \rrbracket$
 4. $NP: \llbracket DET^2 \rrbracket (\llbracket N \rrbracket)$ $\Leftarrow Det^2: \llbracket Det^2 \rrbracket, N: \llbracket N \rrbracket$
 5. $DET^2: \llbracket SPEC \rrbracket (\llbracket DET^1 \rrbracket)$ $\Leftarrow Det^1: \llbracket Det^1 \rrbracket, SPEC: \llbracket SPEC \rrbracket$
- TENSE AND PROG:
1. $S': \llbracket INFL \rrbracket (\llbracket S \rrbracket)$ $\Leftarrow INFL: \llbracket INFL \rrbracket, S: \llbracket S \rrbracket$
 2. $S': \llbracket PROG \rrbracket (\llbracket S \rrbracket)$ $\Leftarrow PROG: \llbracket PROG \rrbracket, S: \llbracket S \rrbracket$

3. $[[\text{INFL}]] = \lambda S \exists I \exists I_R [S(I) \wedge I = \text{Ent}^+(I_R) \wedge \text{Tense}_\alpha(I_R)(i^*)]$
4. $[[\text{PROG}]] = \lambda S \lambda J' \exists J [S(J) \wedge J' \subset J]$
5. $[[\text{INFL}_{hab}]] = \lambda S \exists I \forall I [I \in I \rightarrow \exists I_R [S(I) \wedge I = \text{Ent}^+(I_R) \wedge \text{Tense}_\alpha(I_R)(i^*)]]$

There are a number of things which deserve comment here. First of all, the VP is being given syncategorematically to save on complexity in the derivations— the $\lambda I \lambda X$ part of the VP formula is to be ignored until the subject NP takes the VP, and tense gives the value for I. The VP has two extra argument positions built into it: one, I provides for the eventual anchoring to tense, and represents a set of time intervals occupied by the event; the other, i, is the time index variable discussed above which is used to express ‘progress’ in time in certain classes of verbs. The domain of interpretation for i is the set of natural numbers. This reflects our ability as speakers to make discrete and ordered sense of dense time structure. The large interval I is also idealized in the sense that it is intuitively the union of all the moments that i ranges over in the predication.

The system assumes that class of verbs containing the variable ‘i’ is also the class which assigns Θ roles. These Θ roles given below are functions which take an NP object argument.

Θ - interpretation:

$$\begin{aligned} [[\Theta_{=}]] &= \lambda NP \lambda W \exists R [NP(R) \wedge \bigcup_I W = R] \\ [[\Theta_{\subseteq}]] &= \lambda NP \lambda W \exists R [NP(R) \wedge \bigcup_I W \subseteq R] \\ [[\Theta_{\subset}]] &= \lambda NP \lambda W \exists R [NP(R) \wedge \bigcup_I W \subset R] \end{aligned}$$

The Θ function operates on the NP denotation to give the set of functions W which map from the index i to the collection of sets that are contained in or equal to the NP partition. Then, when the NP' function operates on the V denotation, the denotation of the verb gets filled in for W . We end up with a mapping constructed between the time index associated with the verb, i, and the cells of the NP partition which are V-ed at i. The different Θ functions then vary according to whether the collection of sets which are ‘verb’-ed at different moments i, is strictly equal to, or merely contained in the NP partition.

The NP interpretation schema are shown below:

SPEC

$$\begin{aligned} [[\text{the}]] &= \lambda D \lambda X \lambda P. [D(X \cap C)([[\text{thing}]] \wedge \exists Q \text{ps} X \cap C [Q = P|_{X \cap C}]] \\ [[\emptyset]] &= \lambda D \lambda X \lambda P. \exists W [W \subseteq X \wedge D(X)(W) \wedge \exists Q \text{ps} W [Q = P|_X]] \end{aligned}$$

DET¹

$$\begin{aligned} [[\text{sg}]] &= \lambda X \lambda Y. |X \cap Y| = 1 \\ [[\text{pl}]] &= \lambda X \lambda Y. |X \cap Y| > 1 \\ [[n]] &= \lambda X \lambda Y. |X \cap Y| = n \end{aligned}$$

$$\begin{aligned} \llbracket \text{most} \rrbracket &= \lambda X \lambda Y. |X \cap Y| > \frac{1}{2} \cdot |X| \\ \llbracket \text{several} \rrbracket &= \lambda X \lambda Y. |X \cap Y| \geq 2 \end{aligned}$$

Turning to the verbal interpretations, Verkuyl's system encodes a fundamental asymmetry between the internal argument NP and the external argument NP. Only the former may receive the Θ function, which means that only the internal argument is constructed in a tight relationship with the time index of the verb. The external argument is simply mapped onto the path constructed from the verb and its internal argument.

$$\begin{aligned} \llbracket V^0 \rrbracket &= \lambda I \lambda X \lambda i. \llbracket V_0 \rrbracket (I)(i)(X) && \text{unergative scheme} \\ &= \lambda I \lambda i \lambda Y. \llbracket V_0 \rrbracket (I)(i)(Y) && \text{unaccusative scheme} \\ &= \lambda I \lambda X \lambda i \lambda Y. \llbracket V_0 \rrbracket (I)(i)(Y)(X) && \text{transitive scheme} \end{aligned}$$

The important class of stative verbs is captured in this system by the fact that these verbs are lexically specified as not having a variable i . Verkuyl implements this by setting $i=0$ in the lexical specification of the verb (as opposed to leaving the variable out altogether).

I see a number of empirical problems in some of Verkuyl's classifications here. There are real problems in his treatment of the so-called 'push' verbs, and the external role needs to be more deeply analysed. The internal roles that Verkuyl uses in his system can be shown to be inadequate for the full spectrum of different verb types that are found in languages. However, there is a core idea here which I think can be maintained. This idea is the notion that the internal roles are characterized by a close relationship with the temporal index of the verb. Whether the intuitive 'path' denoted by the VP is constructed from partitions of the NP object, or from its physical or abstract locations, the internal role is involved in 'path construction' in a way that the external argument is not. I will continue to work with Verkuyl's restricted set of roles for the purposes of this paper, bearing in mind that the set will have to be elaborated to account for some of the basic verb types in natural language.

This theory makes a number of basic semantic distinctions possible. In each case the correspondence to the system of Krifka (1989) is also indicated.

(1) We can distinguish verbs on the basis of whether they are [+ADD TO] (change of state) verbs or not (Summativity plus GRAD for Krifka). Equivalent to whether there is a variable 'i' in the denotation.

(2) We can distinguish formally the different θ -relations of $\Theta_{=}$ and Θ_{\subseteq} depending on whether the partition of the NP object provides a complete path for the verb's change or not. (This is represented by the features GRAD and UNI-E in Krifka's system).

(3) We can distinguish between NPs which are [+SQA] (quantized, in Krifka's terms) or not.

There is a basic issue here with respect to whether a semantic framework takes events to be primitives in the semantic representation or not. In fact, the event variable is conspicuously absent from the PLUG+ system. There has been much discussion in the semantic literature about whether we need 'events' in semantic representation, or whether we can make do with real world intervals. There is also an issue related to this which involves the exact nature of the primitives in a theory of natural language semantics. It seems that the framework of Verkuyl (1992) comes down squarely on the side of the 'interval' supporters. Indeed the rhetoric of Verkuyl (1992) is explicitly against the notion of 'event'. However, a closer look at the formal mechanisms employed by Verkuyl will show that he really cannot get away with such a position. The introduction of the variable *i*, and the *I* in the VP denotation cannot be interpreted with respect to real world time intervals. The notion of time here is an extremely idealized one, and can only be made sense of in the context of the conceptual notion of event. The individualized moments *i*, in the VP denotation are only intelligible with respect to some primitive notion of what constitutes a subevent for particular lexical event types. Similarly, the *I* which is part of the VP denotation is actually the temporal side of a Davidsonian spatio-temporal event variable— it cannot be defined from time intervals alone but is directly representative of our ability to isolate some conceptual duration of an event in the world. The idea of bounded and unbounded *I*s cannot, I think, be reduced to truth at an interval, but is itself primitive and corresponds to a primitive difference in event type that is distinguished by humans and natural language.

In the next section I examine how these different semantic components correspond, or don't correspond to the syntactic and morphological devices of aspect in SGaelic. The questions I will try to resolve are the following. Is it possible to give a decomposition of the semantics in these terms to give separate contributions of the verbal noun, the aspectual head, and the direct object which make the right predictions about the aspectual classification of the sentence as a whole ?

Contribution of the Aspectual Head in SGaelic

In assessing the semantic contribution of the aspectual head, it is important to establish from the outset that the so-called periphrastic progressive in SGaelic is not at all like its namesake in English, but is one instantiation of a systemic class of aspectual constraints on the VP interpretation. Specifically, it acts more like a simple (imperfective) present tense than a progressive. The following examples demonstrate the imperfectivity of this construction, using a standard test with the question cleft 'for how long'.

- (8) Bha mi ag òl leann.
 Be-PAST I-NOM 'ag' drink-VNOUN beer
 "I drank beer."
- (9) Dè cho fada 's a bha thu ag òl leann?
 How long that be-PAST you-NOM 'ag' drink-VNOUN beer
 "How long were you drinking beer for?"

Sentences in the periphrastic 'progressive' are always compatible with this question cleft, whereas other constructions such as the simple past in SGaelic are infelicitous in this form. In this regard, the periphrastic progressive is like the English progressive. However, it differs from the English construction in that it is perfectly compatible with stative verbs.

- (10) Dè tha thu a'ciallachadh?
 What be-PRES you-NOM 'ag' mean-VNOUN
 "What do you mean?"
- (11) Tha mi ag iarraidh cupa ti.
 Be-PRES I-NOM 'ag' want-VNOUN cup of tea
 "I want a cup of tea."

Moreover, the periphrastic progressive is *only* way to express stative meanings in this language. SGaelic has no independent simplex present tense, and thus all stative predications involving verbs are made using this construction. In the past, the simplex past tense is incompatible with stative interpretations, the periphrastic progressive past must be used to express these meanings.

Again unlike the English progressive, the SGaelic construction in *ag* can be used to express habitual characteristic sentences.

- (12) Tha Calum a'smoadh
 Be-PRES Calum *ag* smoke-VNOUN
 "Calum smokes."

This set of uses clearly points to the SGaelic progressive construction being more like a simple present tense in Romance than a 'progressive' in English. The striking thing of course, is that this 'simple present' is morphologically discontinuous, with separate tense and aspectual elements.

While the periphrastic progressive is unambiguously atelic, the periphrastic perfect is telic. And unlike the Romance perfect, and to a lesser extent the English perfect, it is confined to the expression of events that have *just* been completed.²

²The particle 'a' here is argued in Ramchand (1992) to be a case of Object Agreement, here notated as OM.

- (13) Tha mi air cupa tì (a) òl
 Be-PRES *air* cup of tea (OM) drink-VNOUN
 “I have (just) drunk a cup of tea.”

In the terminology of Verkuyl (1992) what these particles seem to be doing is two-fold. Firstly, they put constraints on the ‘I’ introduced by the predication, stating whether it is bounded or not. Secondly, they may also indicate which moment within that interval is anchored to the tense of the sentence.

Given this necessary component of meaning in the perfect morpheme, it is not surprising to find out that SGaelic morphological forms express the whole range of possibilities for anchoring a single moment within an event to tense. In the case of *air* the morpheme seems to be doing the work of singling out the final moment of the event time, in the case of *ag* what we have is the expression of the fact that *some* moment within the event time is anchored to tense, and we even have a morphological form *gus* in SGaelic which expresses the fact that the *originary* moment in the event time is anchored to tense. An example of this type of sentence is shown below.

- (14) Tha mi gus cupa tì (a) òl
 Be-PRES *gus* cup of tea (OM) drink-VNOUN
 “I am just about to drink a cup of tea.”

This morpheme is like the perfect *air* in that it imposes the constraint that the I introduced by the predication is bounded, but it is different from *air* in that it states that it is the initial moment, not the final moment of I_R which is anchored to tense.

air: Introduce a bounded interval I s.t. $I = \cup_j i_j$ (where $j \in N$). Anchor i_f to tense, where i_f is the *final* moment in I (ie. $\neg \exists (i_m \text{ s.t. } i_m \in I \wedge m > i)$)

gus: Introduce a bounded interval I s.t. $I = \cup_j i_j$ (where $j \in N$). Anchor i_o to tense, where i_o is the *initial* moment in I (ie. $\neg \exists (i_m \text{ s.t. } i_m \in I \wedge m < i)$)

ag: Introduce an unbounded interval I s.t. $I = \cup_j i_j$ (where $j \in N$). Anchor i_j to tense, where $i_j \in I$.

What this means is that in SGaelic the verbal noun does not come lexically specified for any ‘event’ type, it is not inherently classified as introducing either a bounded or non-bounded I. This is consistent with the fact that there are no restrictions on the appearance of different verbal nouns with these different aspectual constraints— all verbal nouns are grammatical in all of these constructions. However, verbal nouns do seem to be lexically distinguished as to whether they are stative or eventive. We must assume that verbal nouns are lexically classified for [+ADD TO] or [– ADD TO]. In the former case, constraints on I amount to the existence or non-existence of definite final and

originary moments. In the latter, the single conceptual moment embodied by the verb meaning can be of specific finite duration or not, depending on whether 'I' is constrained to be bounded or unbounded by the aspectual particle. To summarize so far, the contributions of the verbal noun and aspectual particle seem to be as follows:

Aspectual particles put constraints on the temporal architecture of I, and how it is anchored to tense.

Verbal Noun is lexically classified as either [+ADD TO] or [-ADD TO]

The other important component of this investigation is the difference in the interpretation of objects depending on whether they are pre-posed or post-posed, and whether they are in the direct or genitive case respectively.

Recall that the post-posed genitive object is associated with the atelic constructions, whereas the telic constructions have pre-posed direct marked objects. Moreover, the direct case marked objects appear to have specific readings, and, for the appropriate kind of predicate, completely affected interpretations. The genitive marked objects on the other hand, tend to be non-specific or not completely affected.

One obvious strategy would be to associate the different phrase structural positions with interpretations consistent with either quantized or non-quantized denotations. However, this will not work, for a number of reasons. The first is that the notion of quantized or [+SQA] is tied directly to the denotation of the NP determiner itself. As one can see from the following two sentences, before taking case-marking into account, the class of NPs that may appear post-verbally is exactly the same as the class that appears pre-verbally. Specifically, NPs which one might independently expect to be 'quantized' in reference appear in the post-verbal position marked with the genitive.

- (15) Bha Calum a'gearradh na craoibhe.
 Be-PAST Calum *ag* cut-VNOUN the tree-GEN
 "Calum was cutting trees."

Conversely, NPs which one might expect independently to have non-quantized reference may appear pre-verbally in direct case.

- (16) Bha Calum air craobhan (a) ghearradh.
 Be-PAST Calum *air* trees-DIR OM cut-VNOUN
 "Calum had cut some (of the) trees."

Of course the *interpretation* of these objects is rather different from what one might expect from the nature of the NP. In fact, in the case of (15) the definite object is interpreted as 'at the tree' in the closest English translation.

In (16) the bare plural object is interpreted the generic name of the kind 'trees', or as a specific quantity of some particular trees. It can never get a weak existential reading.

The other problem with the quantized/non-quantized strategy is that this distinction really only gives us the correlations to telic and atelic predication in the context of verbs which conform to the 'mapping to portions of object' type (i.e. the verbs of consumption and creation). The semantic relationship which guarantees this correlation is absent in other types of verbs, and specifically in [- ADD TO], or stative verbs. However, the stative verbs in SGaelic show the same difference in object position correlated with the differences in interpretation. See the sentences below, which are repetitions of (15) and (16) above but with the verbal noun representing 'seeing'.

(17) Bha Calum a'faicinn na craoibhe.
Be-PAST Calum *ag see*-VNOUN the tree-GEN
"Calum saw the tree."

(18) Bha Calum a'faicinn chraobhan.
Be-PAST Calum *ag see*-VNOUN trees-GEN
"Calum saw trees."

(19) Bha Calum air craobhan fhaicinn.
Be-PAST Calum *air trees-DIR see*-VNOUN
"Calum had seen some (of the) trees."

It can be shown in fact that the behaviour of these objects more closely correlates with the weak interpretation/strong interpretation distinction as found in de Hoop (1991) than in a quantized/non-quantized distinction per se. Summarizing, genitive objects in SGaelic occur with all NP types, and get the following kinds of readings:

- 1) Weak existential readings for indefinites
- 2) Irresultative and/or not completely affected readings on definites and generalized quantifiers generally
- 3) Readings compatible with stative interpretations of the predicate regardless of NP type.

This cluster of possibilities in the readings of genitive objects be shown to conform to the semantics of predicate modification, and this gives rise to the weak existential readings of indefinites as well as the obligatory atelic interpretation of definites and generalized quantifiers. This relationship of predicate modification is argued to correlate with the assignment of a 'Weak Structural Case' by the verb, as opposed to the assignment of 'Strong Structural Case' to true generalized quantifier arguments of a predicate.

This turns out to be the only distinction which makes sense of the full range of SGaelic data. It is beyond the scope of this paper to argue in detail for this position, but the general properties of the analysis are outlined below.

1. Weak Case assigners are of type $\langle e,t \rangle$
2. Morphological Weak case functions to convert non-predicative NP types to a predicate modifying $\langle \langle e,t \rangle, \langle e,t \rangle \rangle$ type
3. The verbal noun in SGaelic can only assign Weak structural case to its object
4. The aspectual head in SGaelic assigns Strong structural case to the position it governs

Now, this makes a rather serious claim about the status of the Θ functions in the Verkuyl (1992), and indeed the Krifka systems. It means in particular that since the arguments of the verbal noun are not true arguments but predicate modifiers semantically, The Verkuyl Θ -roles can only be assigned to the pre-verbal position. These are the only positions, after all, which are marked with strong structural case. And indeed it can be shown to be true that while the post-verbal genitive modifier can conform to a wide variety of semantic relationships with the event and may even include adjectival modifiers, the pre-verbal objects always represent a participant which is *actively* involved in the predication. Specifically, the objects of certain so-called 'stative' verbs get inert predicate modificatory interpretations when in the progressive periphrastic construction as shown below.

- (20) Tha mi ag iarraidh a'bhull.
 Be-PRES I ag want-VNOUN the ball-GEN
 "I want the ball."

However, once the object is preposed, and the direct case is used, the predication loses its stative quality, and the object is interpreted (intuitively) as the physical *goal* of a specific action or event.

- (21) Tha mi air am ball iarraidh
 Be-PRES I AIR the ball-DIR (OM) want-VNOUN
 "I have acquired the ball."

The idea of 'actively involved' in the predication can be made more semantically precise. The notion includes the semantic relationships outlined in the Verkuyl (1992) and Krifka (1989) systems, but is more general. Specifically the active or 'aspectual' roles in this sense are the roles in which an explicit mapping is constructed between the time index 'i' of the verb and some property, state or location of the direct object. In the case of the $\Theta_{=}$ role of Verkuyl this mapping uses the partitions of the object itself, in motion

verbs the mapping uses the actual spatial location of the the object, in change of state verbs the mapping uses the discrete states of the object in question. In all these cases the 'path' that represents the meaning of the VP is constructed from pairings that encode the relation between the time index of the verbs and some property of the object. This constructs the homomorphism between the temporal duration of an event and the 'change' that the object is undergoing, and is a feature of all [+ADD TO] verbs.

These aspectual θ roles are can only be assigned in positions directly governed by the aspectual head in SGaelic. The complement position of the verbal noun seems always to induce a predicate-modificatory relationship between itself and its object, and since the verbal noun itself is aspectually underspecified, this is always compatible with atelic interpretations. To summarize the results of this section.

Aspectual particles assign case to the θ -roles which represent mappings to the event.

Verbal Noun assigns case to projections which have a predicate modificatory relationship to the verb, and which absorb an argument position in the Lexical Conceptual Structure.

The Verbal Noun in Nominal Contexts

In the previous section I argued for a correlation between the the presence of true aspectual arguments and a particular case marking and phrase structural position. By examining the behaviour of the verbal noun in nominal contexts, I wish to show that not only can the verbal noun not assign case to true aspectual arguments, it cannot project them at all in the absence of an aspectual head.

The main generalization is that the Verbal Noun can only assign genitive case in nominal contexts. Moreover, this genitive case can correspond to any of the roles of the predicate. In the following sentence, the genitive modifier corresponds to the 'object' of the predication.

- (22) Chunnaic Iain sgrios a' bhaile
 See-PAST Iain destruction the town-GEN
 "Ian saw the destruction of the town."

In sentence (23) the modifier corresponds to the 'subject' of the predication.

- (23) Chunnaic Iain sgrios nan saighdearan.
 See-PAST Iain destruction the soldiers-GEN
 "Ian saw the destruction of the soldiers."

Unlike 'of phrases' in English, both the subject and the object may appear equally felicitously with genitive marking. Two genitive complements are not possible, as (24) shows,

- (24) *Chunnaic Iain sgrios a' bhaile nan saighdearan.
 See-PAST Iain destruction the town-GEN the soldiers-GEN
 "Ian saw the soldier's destruction of the town."

The sentence is also perfectly good without any genitive complements at all.

- (25) Chunnaic Iain an sgrios
 See-PAST Iain the destruction.
 "Ian witnessed the destruction."

These verbal nouns are compatible with predicates such as 'took a long time' with or without genitive complements, indicating the presence of a time index 'i' in their denotation. But they do not have argument structures in the sense of Grimshaw (1990).

The verbal noun in the purely nominal context does not support pre-posed direct case marked objects, as can be seen from the ungrammaticality of (26).

- (26) *Chunnaic Iain am baile a sgrios
 See-PAST Iain the town-DIR OM destruction
 "Ian saw the destruction of the town."

Another context where verbal nouns show up is in the subject position of certain modals. However, these constituents are full AspPs as can be seen from the fact that they contain a subject position. However, since there is no INFL in these projections, the subject position is ungoverned and hence must show up as big PRO.

- (27) Bu choir dhomh [PRO taigh a cheannach]
 obligation to+me PRO house OM buy-VNOUN
 "I should buy a house."
- (28) 'S toigh leam [PRO leabhraichean a leughadh]
 Liking with+me PRO books OM read-VNOUN
 "I like reading books."

A full lexical subject is ungrammatical in this position, showing that we are dealing with AspP, not IP, nor indeed VP, in this construction.

- (29) *B'fheàrr leam [Mairi taigh a cheannach]
 preference with+me Mairi house OM buy-VNOUN
 "I would prefer that Mary buy a house."

The important thing to note about this construction is that in the presence of a full aspectual projection, the direct object may once again appear in direct case and in pre-posed position.

Moreover, I hypothesize that in these constructions a relationship is predicated between an *event* and an experiencer and that this correlates with the existence of a full aspectual projection here.

This correlation is actually expected under the view that the 'I' in the Verkuyl semantic framework actually corresponds directly to the introduction of the Event variable in the semantic representation, since we saw that it was the aspectual particle that actually put constraints on the nature of I and how it should be anchored to tense. This would make sense if it were the aspectual head that was actually *introducing* the event variable in the semantic representation of the sentence.

If this is true then it makes a prediction concerning the translation of certain kinds of event nominals from English to SGaelic. There is a contrast in English between sentences such as 'The singing of that song was beautiful' and 'The singing of that song was surprising'. In the latter sentence there is an interpretation according to which it is not that the singing was done in a surprising way, but that the event of singing was itself surprising because it even happened at all. We cannot get this latter interpretation unless an event variable *e* is introduced in the semantics. If the correlation stated above is on the right track than such interpretations should not be possible in Scottish Gaelic using the simple verbal noun with genitive complement.

Consider the SGaelic sentence below.

- (30) Bha seinn Chalum uamhasach
 Be-PAST sing-VNOUN Calum-GEN terrible
 "Calum's singing was terrible"

When the predicate is a quality like 'terrible' or 'beautiful', the construction above is perfectly adequate. But as soon as we use the predicate 'surprising', with the interpretation required, something very interesting happens.

The only possible way of expressing this is to say 'It was a surprising thing that was in Calum's singing.', where 'Calum' is pre-posed and in the direct case!³

- (31) 'Se cùis iongnaidh a bh'ann Calum a bhith a'seinn .
 It is surprising thing that was in Calum OM be-VNOUN ag sing-VNOUN
 "Calum's singing was surprising."

Of course it is always possible to express this with a CP complement as well as in (32) below, but this is not the interesting case.

³In this construction, since 'Calum' is not strictly the 'object' of sing, the verb 'to be' is inserted which is unaccusative and so licenses the pre-posing of the 'subject' here.

- (32) Bha e iongnadh gun robh Calum a'seinn fad uair a thide
 Be-PAST it surprising that be-PAST Calum *ag* sing-VNOUN for one hour.
 "It was surprising that Calum sang for one hour."

What is important here is that we find a correlation between the existence of an aspectual projection in the syntax and the presence of an event variable in the semantics. SGaelic allows us to see this correlation clearly because the aspectual head and the verbal noun have separate morphological expression, and because the case-marking and position of the direct object allow us to recognise the existence of an aspectual projection even when it is not morphologically overt.

Thus, the aspectual head is responsible for the introduction of the event variable and for the assignment of Verkuyl/Krifka Θ -roles. The division of labour seems to be that while the verbal noun is responsible for the detailed semantic and real world information, it is the aspectual head which allows the construction of the related 'argument structure', which following Davidson (1967) Higginbotham (1985) and others, I assume also contains the event variable.

To summarize:

The Aspectual head

- (1) *Introduces the event variable in the semantic representation*
- (2) *Actually assigns the θ roles which represent mapping to the event.*

The Verbal Noun

- (1) *Introduces no event variable*
- (2) *Has a Lexical Conceptual Structure which contains lexical semantic information on the number and kind of arguments.*

Conclusion

The verbal noun in SGaelic is interesting precisely because it appears in both nominal and verbal predication. Assigning the type of $\langle e, t \rangle$ to the verbal noun allows us to maintain a consistent type for this form in both contexts. However, this forces us to put the burden of constructing the properties of 'verb-hood', on the head of the aspectual projection in this language. In particular, it is the aspectual head which is responsible for the introduction of an event variable in the semantic representation, and it is the aspectual head which is responsible for assigning direct case (and presumably the θ -role themselves) to the nominal arguments. The aspectual head, since it introduces the event variable in the semantic representation is also capable of placing lexical restrictions on the internal architecture of the event and how it must be anchored to tense.

In languages like English, verbs are inherently aspectual and hence of type

$\langle e, \langle e, t \rangle \rangle$. This means, in my terms here, that English verbs must raise obligatorily to the head of Asp at S-structure, and that the English verb contains an argument structure and is inherently capable of assigning strong structural case to its objects. The English gerund, while not carrying tense information is also inherently of the aspectual type, which explains its interpretation in eventive constructions and also in fact its ability to assign accusative case in these constructions ('John's singing the song was unexpected.').

The derived nominal in English may in fact be a better analogue for the SGaelic verbal noun than the gerund. It is unclear to me at this point what the correlation is between process nominals and result nominals and the SGaelic. My instinct is to say that process nominals differ from result nominals in that the former introduce a time index 'i', whereas the latter do not. The SGaelic verbal noun would therefore clearly be of the process nominal kind, though not of the full aspectual type to include an event variable in its representation.

The following list summarizes the basic properties of the verbal noun, as opposed to a verb of the full aspectual 'type'.

Verbal Noun:

- (i) of type $\langle e, t \rangle$
- (ii) Does not introduce an event variable.
- (iii) Can only assign weak case (predicate modification).
- (iv) Is neutral with respect to aspectual classification.
- (v) Only provides LCS information

Verb of Full Aspectual Type:

- (i) Of type $\langle e, \langle e, t \rangle \rangle$.
- (ii) Introduces an event variable,
- (iii) Assigns the θ -roles which represent mappings to the event.
- (iv) Can encode aspectual information (restrictions on internal structure of e).
- (v) Provides information on the 'Argument structure' of the predication, in addition to the LCS.

The verbal noun in Scottish Gaelic and the aspectual head it appears with seem to embody a fairly clear distribution of semantic 'labour'. While the verbal noun contributes the substantive aspects of the predication, including detailed semantic information, and presumably some equivalent of an LCS, it seems to be independently incapable of constructing a mapping between the verbal event and the particular verbal objects. It is this mapping which I claim is correlated with assignment of direct case, and indeed with the assignment of specific 'aspectual' θ roles in the syntax. I claim that an argument structure in this sense can only be constructed by the verbal noun *together* with the aspectual head. This means that the particular kind of information that goes along with θ -role assignment is only constructed at the level of D-structure, and interpreted at the level of Logical Form, it is not present lexically in the

meaning of the verbal noun.

This has real implications for the projection principle. Consider the statement of the projection principle in Speas (1990)

Projection Principle: The UTAH and the Theta Criterion hold at all Syntactic Levels.

Theta Criterion:

- (a) Every thematic position is discharged.
- (b) If X discharges a thematic role in Y, then it discharges only one.

Uniformity of Theta Assignment Hypothesis (UTAH): Identical thematic relationships between items are represented by identical structural relationships between those items at the level of D-structure.⁴

What I am arguing is that the LCS of a predicate and its argument structure are introduced by different Heads in the syntax. In fact, I am claiming that the part of the projection principle as expressed by the UTAH above does not make sense. This is because the kind of information represented at the LCS level is completely qualitatively different from the kind of relations expressed by argument structure. Specifically aspectual information and θ assignment are only constructed at the level of D-structure.

SGaelic is interesting precisely because it wears its aspectual information on its sleeve, and explicitly constructs its predication morphologically from a substantive core and an 'eventive' aspectual head. Consider an analogue to the nominal domain. Just because we are used to thinking of nouns as being inherently referential, this does not stop us from recognising that there is a referential head 'D', and that most things which we commonly think of as referential nouns are actually DPs. This 'D' shows up morphologically in classifier languages, where the nominals seem to get only predicative readings in the absence of the classifier. In the same way, we are accustomed to thinking of verbs as being inherently aspectual, and maybe indeed we should reserve the label of 'verb' for those that are. However, this is not to deny that the notion of verb is decomposable into two separable components, potentially even projected as separate heads in the D-structure. SGaelic is the equivalent of a 'classifier' language in this sense— its verbal nouns must appear with aspectual 'classifiers', which can actually change the semantic type, and allow the projection to have fully verbal properties.

⁴Taken from Baker (1988).

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