

# Multiple Perfects in Scottish Gaelic

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## 1. Introduction

In this paper I investigate three particles in Scottish Gaelic (hereafter *SG*) which share a particular syntactic distribution, and argue that they all share a particular type of semantics: namely, perfect aspectual semantics. I argue that the semantics of these constructions share something fundamental: the relation that is predicated between event time (ET) and reference time (RT), which is a precedence relation (rather than a containment relation, as is seen in perfectives and imperfectives). I further argue that there are two precedence relations between ET and RT that can be realized in a language and still have the same basic type of semantics: ET prior to RT or RT prior to ET. The former relation is that found in “typical” perfect constructions; the latter, I will argue, is that found in constructions like *gu* ‘about to’ in SG. I will call these constructions “prospective”<sup>1</sup> perfects, and traditional perfects “retrospective”<sup>2</sup> perfects. I also argue that in SG, there are restricted versions of both types of perfect, which are often glossed as ‘have just’ and ‘be about to’. I claim that the existence of the restricted perfects challenges the assertion in Iatridou, et al. (2001) that the interval between ET and RT does not have “a distinguished status” in the perfect.

The paper is organized as follows: Section 2 gives background on SG and grammatical aspect. In section 3 I propose sets of characteristics to test for perfect semantics. In section 4 I apply these tests to the phenomena in SG, and argue that what we are seeing are variations on perfect semantics. In section 5 I give semantic analyses of the particles that instantiate these semantics in SG.

## 2. Background

### 2.1. Scottish Gaelic

SG is spoken in the Highlands and Islands region of Scotland. An endangered language with no monolingual speakers remaining, it is a particularly interesting language in which to investigate grammatical aspect, which is marked on particles homophonous and homographic with prepositions.

### 2.2. Aspect

While tense can be thought of as locating the time expressed by the proposition on a line, grammatical or viewpoint aspect is said to give a picture of the architecture of the time of the situation (event or state) described by the proposition. Along with perfective and imperfective aspects (including progressive), perfects are also sometimes classified with aspect. I assume that tense relates

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<sup>1</sup> Comrie (1976), Dahl (1985), and others use this term to describe things like ‘be going to’ and ‘be about to’ in English and other languages; Cram (1982) uses it to describe *gu* itself.

<sup>2</sup> This term has sometimes been used to refer to a ‘just’ aspect (see e.g. Cinque 1999).

speech time to a reference time; that grammatical aspect relates event time to a reference time; and that denotations of vPs are predicates of events or states. I assume a hierarchy of tense and aspect as in (1).

- (1) [TP Tense [AspP Viewpoint Aspect [vP Aktionsart ]]]

### 2.3. Tense and aspect in SG

For past and future tenses, contentful verbs have analytic forms which fuse tense and perfective (aoristic) aspect; there is no present tense perfective form. In (2a) we can see the past perfective and in (2b) the future perfective forms of the verb ‘to write’. Also note the canonical VSO order.

- (2) a. Sgrìobh mi litir.                      b. Sgrìobhaidh mi litir.  
 write.past\_pfv<sup>3</sup> 1s letter                      write.fut\_pfv 1s letter  
 ‘I wrote a letter.’                                      ‘I will write a letter.’

Present tense propositions (progressive eventives, but also statives and habituais) must be conveyed using the progressive/imperfective periphrastic construction with the particle *a’* (*ag* before vowels), a form of ‘be’, and the participial form of the verb (traditionally called the ‘verbal noun’).

- (3) a. Tha mi a<sup>4</sup> sgrìobhadh litir.                      b. Tha mi a’ tuigsinn sin.  
 be.pres 1s A’ write.vn letter                      be.pres 1s A’ understand.vn that  
 ‘I am writing a letter.’                                      ‘I understand that.’
- c. Tha e a’ sgrìobhadh a h-uile latha.  
 be.pres 3sm A’ write.vn every day  
 ‘He writes every day.’ (Lit. ‘He is writing every day.’)

There are several other tense/aspect combinations that are periphrastic in nature—that is, they use the verb ‘be’ in one of its forms, plus a separate particle to indicate grammatical aspect, and the main verb in the ‘verbal noun’ form. The particles *ann*, *a’*, *air*, *as dèidh*<sup>5</sup>, and *gu* can be seen here:

- (4) a. Bha/Tha/Bithidh mi ’nam sheasamh.  
 be.past/pres/fut 1s ANN.poss.1s stand.vn  
 ‘I was/am/will be standing [in a standing position].’
- b. Bha/Tha/Bithidh mi a’ sgrìobhadh litir.  
 be.past/pres/fut 1s A’ write.vn letter  
 ‘I was/am/will be writing a letter.’
- c. Bha/Tha/Bithidh mi air litir a sgrìobhadh.  
 be.past/pres/fut 1s AIR letter tran write.vn  
 ‘I had/have/will have written a letter.’
- d. Bha/Tha/Bithidh mi as dèidh litir a sgrìobhadh.  
 be.past/pres/fut 1s AS DÈIDH letter tran write.vn  
 ‘I had/have/will have just written a letter.’
- e. Bha/Tha/Bithidh mi gu litir a sgrìobhadh.  
 be.past/pres/fut 1s GU letter tran write.vn  
 ‘I was/am/will be about to write a letter.’

<sup>3</sup> Abbreviations used in this paper: 1, 2, 3 1ST, 2ND, 3RD PERSON; comp COMPLEMENTIZER; dep DEPENDENT FORM; f FEMININE GENDER; fut FUTURE TENSE; m MASCULINE GENDER; neg NEGATIVE; p PLURAL NUMBER; poss POSSESSIVE PRONOUN pfv PERFECTIVE; pres PRESENT TENSE; s SINGULAR NUMBER; tran TRANSITIVIZER; vn VERBAL NOUN.

<sup>4</sup> This particle is the only one of the aspectual particles that is not precisely homophonic and homographic with a preposition, though it is very close to *aig* ‘at’. Despite the similarities between the aspectual particles and prepositions, they are understood to be distinct (at least synchronically); see especially McCloskey & Hale (1984).

<sup>5</sup> The data here are from a native speaker of the Skye dialect of SG. *As dèidh* is *an dèidh* in some dialects.

It has been argued that *a'* marks (dynamic) progressive (or imperfective) aspect (Ramchand 1993, Reed *In progress*); that *ann* marks (for the verbs it appears with) static imperfective aspect (Reed *ibid.*); that *air* marks perfect aspect (Ramchand 1993, Reed *ibid.*); and that *as dèidh* marks restricted retrospective perfect aspect (Reed *ibid.*). Ramchand (1993) labels *gu* a 'prospective' and states its contribution as anchoring the initial moment of the time interval of the event to tense—that is, that it basically means 'about to'. I (Reed *ibid.*) analyze it as marking restricted prospective perfect aspect.

I argue here that the distribution of the data with the particles *air*, *as dèidh*, and *gu* support an analysis of them as contributing perfect aspectual semantics (*air* and *as dèidh* traditional retrospective perfect semantics, and *gu* prospective perfect semantics), and where *as dèidh* and *gu* have an added restriction on the length of the interval between event time and reference time.<sup>6</sup> Next, I will briefly discuss the morphosyntactic and semantic criteria I will use to test for perfecthood.

### 3. Tests for perfects

#### 3.1. Retrospective perfects

First I will describe the semantic and distributional criteria that are often used to pick out typical retrospective perfects; then I present criteria for prospective perfects. First, I assume that what predicts the basic meaning of a distinction of grammatical aspect is the relation its operator (in Asp) defines between event and reference time. This is most likely too simple a position, but it will suffice for my purposes here. Next, I assume the fairly typical characterization of the Perfect in English that it establishes an ET prior to RT, and that it is (at least distributionally) an aspectual distinction.

Our "tests," then, are as follows: First, perfects seem to be stative in some way (see, e.g., Bennett & Partee 1978, Taylor 1977, Vlach 1993, ter Meulen 1995, Katz 2003, Pancheva & von Stechow 2004). Next, perfect sentences focus on the result of an eventuality, and that result continues indefinitely (for non-Universal readings, at least) (see, e.g., Parsons 1990, Vlach 1993, Giorgi & Pianesi 1998). Third, present perfect sentences express anteriority, but certain past adverbials render them infelicitous (the 'Present Perfect Puzzle' (Klein 1992); also Pancheva 2004, Panchevaras & von Stechow 2004, and others). Fourth, past perfect sentences can take time adverbials in two positions, leading to event and reference time readings, depending on position (McCoard 1978, Comrie 1985, Klein 1992, Michaelis 1994). Finally, depending on the language, the present perfect may have several readings, including universal (eventuality is seen as continuing into reference time), experiential (subject is seen as having had an experience), and resultative (with telic predicates, only for as long as the eventuality holds) (McCawley 1971, McCoard 1978, Dowty 1977, Mittwoch 1988, Iatridou, et al. 2001). I will focus here on the last three tests. In short, then, our tests for (retrospective) perfecthood are the following: (1) distributionally aspectual; (2) locates ET prior to RT; (3) present tense infelicity with past tense adverbials; (4) past tense two slots for time adverbials; (5) different readings.

#### 3.2. Prospective perfects

Joos (1964) and some scholars since have suggested that the meaning of 'be going to' in English is the reverse or 'mirror image' (Binnick 1991) of the meaning of the regular perfect. I will refer to the typical perfect as the 'retrospective perfect', and to a possible mirror-image perfect as the 'prospective perfect'. I will take to be expressing prospective perfect semantics a morphosyntactic distinction which: (1) is distributionally a distinction of aspect; and (2) orders ET after RT in its basic meaning. Once we have established that something is a prospective, we could go on to see if it indeed acts like a retrospective perfect in other ways (although I will not explore this question in depth here).

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<sup>6</sup> I also argue in Reed (*In progress*) that the construction *a' dol a* in SG, roughly 'going to', is parallel to *air*, in the other direction—that is, that SG has a four-way division of perfect aspects: two retrospective, two prospective, and in each direction one unrestricted and one restricted.

## 4. Data

### 4.1. *The particle air*

I have already shown in (4c) that *air* co-occurs with past, present, and future tense marking, so we can reasonably assume that we are dealing with ET and RT here, rather than speech time and RT. It is also clear that sentences with *air* entail that ET is prior to RT: (5) is only acceptable if at some point prior to RT, *Tha Iain a' falbh* 'Iain is leaving' was true.

- (5) Tha Iain air falbh.  
 be.pres Iain AIR leave.vn  
 'Iain has left' entails that there was a leaving by Iain.

Present perfect sentences in English are generally felicitous with present adverbials but not with past "positional" adverbials (Comrie 1976, McCoard 1978), which locate the event time at a specific point prior to speech time. The same pattern is seen in SG in sentences with *air*. Modification by a present positional adverbial, which fixes the event time at the moment of speech, yields a felicitous sentence, as in (6); a past positional adverbial, however, yields infelicity, as in (7a) and (7b). Note that a past positional adverbial is infelicitous even if it indicates a very recent time, as in (7c).

- (6) Tha Calum air falbh an-drasda.  
 be.pres Calum AIR leave.vn now  
 'Calum has left now.'
- (7) a. #Tha mi air ithe an-dè.  
 be.pres 1s AIR eat.vn yesterday  
 #'I have eaten yesterday.'
- b. #Tha mi air Iain fhaicinn an-dè.  
 be.pres 1s AIR Iain see.vn yesterday  
 #'I have seen Iain yesterday.'
- c. #Tha mi air Iain fhaicinn o chionn còig mionaidean.  
 be.pres 1s AIR Iain see.vn since five minute.p  
 #'I have seen Iain five minutes ago.'

In English, when a past tense experiential perfect is modified by an adverbial like 'at noon', the available readings of the perfect depend on the position of the adverbial. When the adverbial is postverbal, either an event-time reading or a reference-time reading is available for the adverbial. SG shows the same pattern; (8) allows both readings, while (9a) and (9b) show RT and ET readings, respectively. As in English, a sentence with a preverbal adverbial prohibits an ET reading, as in (9c).

- (8) Bha Calum air a' bhùth fhàgail aig meadhon-latha.  
 be.past Calum AIR the.sf shop leave.vn at mid-day  
 'Calum had left the store at noon.'
- (9) a. Bha Calum air a' bhùth fhàgail mar tha aig meadhon-latha.  
 be.past Calum AIR the.sf shop leave.vn already at mid-day  
 'Calum had left the store already at noon.'
- b. Bha Calum air a' bhùth fhàgail dìreach aig  
 be.past Calum AIR the.sf shop leave.vn directly at  
 meadhon-latha, agus bha Iain air a' bhùth fhàgail aig uair.  
 mid-day and be.past Iain AIR the.sf shop leave.vn at one  
 'Calum had left the store precisely at noon, and Ian had left at 1.'
- c. Aig meadhon-latha, bha Calum air a' bhùth fhàgail (mar tha).  
 at mid-day be.past Calum AIR the.sf shop leave.vn (already)  
 'At noon<sub>t1</sub>, Calum had left<sub>t2</sub> the store (already).' #'Calum had left<sub>t</sub> the store at noon<sub>t</sub>.'

Next I will show that SG allows experiential, resultative, and universal readings of its perfects. The sentence in (10a) allows either an experiential or a universal reading. The example in (10b) has an experiential reading, while (10c) has a clearly universal reading.

- (10) a. Tha Alexandra air a bhith ann am Paris.  
 be.pres Alexandra AIR tran be.vn in Paris  
 ‘Alexandra has been in/to Paris.’
- b. Chan eil mi ach air caoraich a rùsgadh aon turas bho dà mhìle.  
 not be.pres.dep 1s but AIR sheep.p tran shear.vn one time from two thousand  
 ‘I have only shorn sheep once since 2000.’
- c. Tha mi air fuireach ann an Glaschu airson ùine mhòr a-nisde.  
 be.pres 1s AIR live.vn in Glasgow for time big now  
 ‘I have lived in Glasgow for a long time now.’

Finally, sentences with *air* allow resultative readings; in (11a) Alexandra is clearly still in Scotland, and the sentence in (11b) is consistent with the glasses still being lost (or not (experiential)).

- (11) a. Tha Alexandra air Alba a ruigsinn mu dheireadh!  
 be.pres Alexandra AIR Scotland tran arrive.vn at-last  
 ‘Alexandra has finally arrived in Scotland!’
- b. Tha mi air mo ghloinneachan a chall.  
 be.pres 1s AIR poss.1s glass.p tran lose.vn  
 ‘I have lost my glasses.’

From these data, I argue that an analysis of *air* as a retrospective perfect particle is warranted.

#### 4.2. *As dèidh*

The compound particle *as dèidh* has a distribution that is similar but crucially non-identical to that of *air*. I analyze *as dèidh* as a restricted retrospective perfect particle—*as dèidh* requires that event time be close to the reference time. Here I present data which demonstrate that sentences with *as dèidh* carry a perfect meaning similar to, but not identical to, sentences with *air*. First, sentences with *as dèidh* appear in past, present, and future tenses:

- (12) Bha/tha/bithidh mi as dèidh a dhol dhachaidh.  
 be.past/pres/fut 1s AS DÈIDH tran go.vn home  
 ‘I had/have/will have [recently] gone home.’

Next, sentences with *as dèidh* entail the occurrence of the eventuality before the RT (indeed, a sentence with *as dèidh* entails the parallel sentence with *air*, as in (13b)):

- (13) a. Tha mi as dèidh ithe.  
 be.pres 1s AS DÈIDH eat.vn  
 ‘I have just eaten’ entails that there was an eating event by me.
- b. Tha mi as dèidh ithe entails Tha mi air ithe.  
 be.pres 1s AS DÈIDH eat.vn be.pres 1s AIR eat.vn  
 ‘I have just eaten.’ entails ‘I have eaten.’

Sentences with *as dèidh* are infelicitous with past positional adverbials, but felicitous with present ones, as sentences with *air* are:

- (14) a. #Tha Iain as dèidh ithe an-dè.  
 be.pres Iain AS DÈIDH eat.vn yesterday  
 #‘Iain has recently eaten yesterday.’

- b. ✓Tha Iain as dèidh ithe an-diugh (mar tha).  
 be.pres Iain AS DÈIDH eat.vn today already  
 ‘Iain has eaten today (already).’

Finally, *as dèidh* permits different readings. The examples in (13) and (14) demonstrate that sentences with *as dèidh* allows experiential readings. Sentences with *as dèidh* can also be interpreted as the (15a) “perfect of recent past” (Iatridou, et al. 2001) or (15b) the “hot news” perfect (McCawley 1971), while in (15c), a resultative reading is found:

- (15)a. Tha e as dèidh ceum a ghabhail.  
 be.pres 3sm AS DÈIDH step tran take.vn  
 ‘He has just graduated.’
- b. Tha Alexandra as dèidh Alba a ruigsinn.  
 be.pres Alexandra AS DÈIDH Scotland tran arrive.vn  
 ‘Alexandra has arrived in Scotland.’
- c. Tha mi as dèidh mo ghloinneachan a chall.  
 be.pres 1s AS DÈIDH poss.1s glasses tran lose.vn  
 ‘I’ve lost my glasses.’

Sentences with *as dèidh* also seem to accept universal readings, though more data need to be gathered.

It seems from these data that *as dèidh* contributes a perfect-like meaning, but requires that the eventuality be relatively recent (that is, close to the RT). Iatridou, et al. (2001) argue that the perfect introduces a ‘Perfect Time Span’ (PTS), whose left bound is set by an adverbial like a ‘since’ adverbial (overt or not). Perhaps it is this time span that needs to be short to allow use of *as dèidh*. If so, sentences with a long PTS should be infelicitous, while those with a shorter PTS could be felicitous. We seem to see this pattern in some data:

- (16)a. Tha mi as dèidh Cher fhaicinn trì tursan an t-seachdain seo mar tha.  
 be.pres 1s AS DÈIDH Cher see.vn three time.p the.sm week.s here already  
 ‘I have recently-seen Cher three times this week already.’ ✓PTS: 1 week
- b. #Tha mi as dèidh Cher fhaicinn trì tursan na mo bheatha.  
 be.pres 1s AS DÈIDH Cher see.vn three time.p in poss.1s life  
 #‘I have recently-seen Cher three times in my life.’ #PTS: Many years

However, if we look more closely, we can see that a long PTS is not necessarily ruled out. What we need is an example where the PTS is long, but the ET-RT interval is short. This is what we see in (17):

- (17) Am bheil thu riamh as dèidh an doras a dhùnadh agus ghabh thu  
 Q be.pres.dep 2s ever AS DÈIDH the.sm door tran close.vn and take.past 2s  
 beachd nach robh na h-iuchraichean agad?  
 opinion neg.comp be.past.dep the.p key.p at.2s  
 ‘Have you ever just closed the door and realized you didn’t have your keys?’

So, in fact, it seems that *as dèidh* does not care about the length of the PTS; rather, it specifies a short ET-RT interval. I will analyze *as dèidh* as a (morphologically complex) particle that instantiates perfect semantics with a restriction on the ET-RT interval.

#### 4.3. *Gu*

Next I will present data with *gu*, with an eye to demonstrating the following characteristics of the semantics of the particle: (1) it marks aspect (not tense); (2) it orders ET *after* RT; and (3) like *as dèidh*, it requires the ET-RT time span to be short. First, note that the verb ‘be’ can appear in past or future tenses (as well as present); this shows that ET is indeed ordered with respect to RT and not speech time. Note also that the word order is parallel to that found with *air* and *as dèidh*.

- (18) a. Bha i dìreach gu fàgail airson a' bhaile an dè nuair a ràinig Calum.  
 be.past 3sf directly GU leave.vn for the.sf town yesterday when arrive.past Calum  
 'She was just about to leave for town yesterday when Calum arrived.'
- b. Ann an còig bliadhna deug, bithidh tu dìreach gu  
 In five year.s teen be.fut 2s directly GU  
 pòsadh nuair a thèid do leannan a mharbhadh.  
 marry.vn when go.fut poss.2s fiancé tran kill.vn  
 'In fifteen years, you will be just about to get married when your fiancé gets killed.'

It is clear from entailments that ET must follow, not precede, RT (although if we only have present tense examples, we cannot distinguish RT from speech time); this ordering is the opposite of the regular retrospective perfect.

- (19) Tha Iain gu falbh.  
 be.pres Iain GU leave.vn  
 'Iain is about to leave' does not entail that there has been a leaving event by Iain.

Future adverbials within a relatively short time frame are natural with *gu* (as they are for many speakers of English with 'about to'):

- (20) a. Tha mi gu fàgail an ceann còig mionaid.  
 be.pres 1s GU leave.vn the.sm head five minute.s  
 'I am about to/going to leave in five minutes.'
- b. Tha mi gu mìle a ruith ann an deich mionaidean.  
 be.pres 1s GU mile tran run.vn in ten minute.p  
 'I'm about to/going to run a mile in ten minutes [from now].'

Ramchand's (1993) basic characterization of *gu* as a prospective particle, expressing "the idea that some action or event is imminent" (p. 33), is supported by these data. However, *gu* isn't just another way to say 'going to'—while a long span of time between RT and ET is fine with *a' dol a* 'going to' in SG, it renders sentences with *gu* infelicitous.

- (21) a. #Tha Iain gu taigh a thogail ann an còig bliadhna.  
 be.pres Iain GU house tran build.vn in five year.s  
 #'Iain is about to build a house in five years [i.e., five years from now].'
- b. ✓Tha Iain a'dol a thogail taigh ann an còig bliadhna.  
 be.pres Iain A'DOL A build.vn house in five year.s  
 ✓'Iain is going to build a house in five years [i.e., five years from now].'

Data points like that in (18b) (relevant part repeated here as (22)) provide evidence for the semantics of *gu* being parallel to those of *as dèidh*—that is, that the limitation is on the RT-ET interval, rather than on a PTS-like interval. If we were to define a Perfect Time Span for prospective perfects (that is, a span delimited on one end by a time adverbial and on the other by reference time), here it would be from the reference time to fifteen years in the future. I think it is clear from this sentence that *gu* does not require a short PTS for felicity, but rather a short RT-ET interval.

- (22) Ann an còig bliadhna deug, bithidh tu dìreach gu pòsadh nuair a...  
 In five year.s teen be.fut 2s directly GU marry.vn when  
 'In fifteen years, you will be just about to get married when...'

Based on these data, then, I argue that *gu* marks restricted prospective perfect aspect in SG.

## 5. Formal analysis

I analyze perfect in SG as a second type of grammatical aspect (in the spirit of Smith (1997), Iatridou, et al. (2001), and Pancheva & von Stechow (2004)). However, I do not locate a PerfectP above AspectP; instead I argue that these particles are realizations of an Aspect operator of type  $\langle\langle vt \rangle, \langle it \rangle\rangle$ . Pancheva & von Stechow argue that the Perfect head introduces a ‘perfect time span’ (PTS, as introduced by Iatridou et al.), whose left bound is set by an adverbial like ‘since’. I claim that in addition to PTS, we must consider the relation between ET and RT; and that it is this relation, rather than the PTS, that is introduced by the Aspect head. I claim that the semantic contribution of grammatical aspect, in general, is to establish some relationship between event time and reference time; what we call ‘perfect’ is just the reflection of a particular type of relationship, one of linear ordering. I assume the following formula for aspect in general:

$$(23) \quad \text{ASPECT} = \lambda P_{(vt)}. \lambda t_{(i)}. [\tau(e) \mathcal{R} t \ \& \ P(e)],$$

where  $\mathcal{R}$  is a relationship to be determined, depending on the instantiation of the aspect head,  $t$  is a time (composed with tense, it will be saturated by the reference time that is grounded by the time of speech),  $\tau$  is the run-time function, and  $e$  is an event(uality). I assume that the Asp head is a function of type  $\langle\langle vt \rangle, \langle it \rangle\rangle$ . In (24) I give the formula for *air*:

$$(24) \quad \begin{aligned} \llbracket \text{AIR} \rrbracket &= \lambda P_{(vt)}. \lambda t_{(i)}. [\tau(e) \leq t \ \& \ P(e)] \\ (\tau(e) \leq t \text{ iff there is no } t' \subset \tau(e), \text{ s.t. } t' > t) \end{aligned}$$

*Air* conveys that the runtime of the event precedes or partially overlaps with RT. Existential closure of the event and of RT take place at the sentence level.

For *as dèidh*, we must specify that the ET-RT interval is short. I use  $\varepsilon$  to denote a small quantity (I assume its precise value will be determined from context); the value of the interval between RT and ET must be less than ( $<$ ) this.

$$(25) \quad \begin{aligned} \llbracket \text{AS DÈIDH} \rrbracket &= \lambda P_{(vt)}. \lambda t_{(i)}. [\tau(e) < t \ \& \ P(e) \ \& \ \exists \varepsilon_c [0 < |t - \tau(e)| < \varepsilon]] \\ (\tau(e) < t \text{ iff there is no } t' \subset \tau(e), \text{ s.t. } t' \geq t) \end{aligned}$$

This says that *as dèidh* conveys that a time (which will be the reference time grounded by tense) fully succeeds ( $>$ ) the runtime of the event; and there is some number determined by the context such that the value of the interval between that time and the runtime of the event is less than that number.

I analyze *gu* as a *prospective* perfect particle, establishing ET in a *subsequence* relation with RT. Additionally, I argue that *gu* (like *as dèidh*) requires that ET be close to the RT. Here, the RT fully precedes ( $<$ ) the runtime of the event. I give a partial sentence-level denotation in (26c).

$$(26) \text{ a. } \llbracket \text{GU} \rrbracket = \lambda P_{(vt)}. \lambda t_{(i)}. [t < \tau(e) \ \& \ P(e) \ \& \ \exists \varepsilon_c [0 < |t - \tau(e)| < \varepsilon]]$$

(t <  $\tau(e)$  iff there is no  $t' \subset \tau(e)$ , s.t.  $t' \leq t$ )<sup>7</sup>

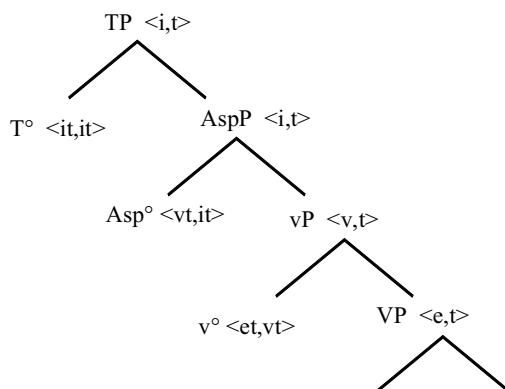
b. Tha Iain gu ithe.  
be.pres Iain GU eat.vn  
‘Iain is about to eat.’

c. =  $\exists t_1 [t_1 = t_c \ \& \ \exists e [t_1 < \tau(e) \ \& \ \text{eat}(\text{Iain}, e) \ \& \ \exists \varepsilon_c [0 < |t - \tau(e)| < \varepsilon]]]$

Tense composes with AspP, and Aspect with vP, as seen in (27):

<sup>7</sup> While a modal semantics may be needed for *gu*, I leave that line of analysis to future work and concentrate here on the time relation involved.

(27)



In this conception of the perfect, the ET-RT span is an important one. SG has two perfects which restrict this span. With perfect-type aspects, Asp introduces a precedence relation between these times, and two such instantiations of Asp also set restrictions on the interval.

## 6. Conclusion

The three particles I have discussed here share similar semantics and, in SG, pattern together syntactically. All three particles introduce a relation between ET and an RT; *as dèidh* and *gu* also require that the span between ET and RT be relatively short. The data presented here indicate that a complete characterization of the perfect (at least in SG) should include both retrospective and prospective semantics, as well as a consideration of the ET-RT interval.

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