Exploring the nature of the syntax-phonology interface:
A post-syntactic account of the Old Irish verbal system[*]

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This paper considers how a more minimalist theory of the syntax-phonology interface might be developed by using only conceptually motivated post-syntactic operations. Data is drawn from Old Irish and a new post-syntactic account of the double system of inflection is developed that makes use of only the conceptually motivated operations Agree, Chain Reduction and Vocabulary Insertion.

1   INTRODUCTION

There is a growing tendency within minimalist syntax for syntactically troublesome data to be accounted for post-syntactically. Many phenomena that cannot be accounted for comfortably by syntactic theory are argued to be a result of post-syntactic processes operating at the interface between syntax and phonology. The notion of an interface level and interface processes is not in itself controversial. Problems arise, however, from the fact that there is no unified theory of the PF interface and few restrictions on the operations that take place there. There is nothing in place to prevent each new post-syntactic account proposing new post-syntactic operations. As a result it seems that virtually anything is possible. This is clearly undesirable within the theory of minimalist syntax, where research focuses on developing a theory of syntax that is highly constrained. Allowing a post-syntactic level which is unrestricted and where anything is possible clearly detracts from this.

This paper begins to consider how a more minimalist theory of PF might be developed by using only conceptually motivated post-syntactic principles. To do this we examine one problematic case, namely the Old Irish verbal system, and consider how this might be accounted for within such a minimalist theory of PF. The structure of the paper is as follows. Section 2 of this paper provides an introduction to the Old Irish verbal system. Section 3 considers why syntax alone cannot account for Old Irish. Section 4 develops a new post-syntactic account of the Old Irish verb. Section 5 concludes the paper.

2   AN INTRODUCTION TO THE OLD IRISH VERBAL SYSTEM

2.1   The double system of verbal inflection

The term 'Old Irish' refers to the Celtic language found in Irish and Continental European manuscripts dating from the eighth and ninth centuries AD. It is the direct predecessor of Irish and Scots Gaelic spoken today in Ireland and Scotland. Like its modern counterparts, Old Irish has unmarked verb initial order in both main and embedded clauses:

(1)   (a) *béoigidir*   *in spirut*   *in corp*   *in*   *fect*   *so*
      vivifies.PRES.3SG the spirit   the body   the   time   this
      'The spirit vivifies the body now'   (Wb 13d7)

      (b) *as-rubart*   *día* *friu-som* *ara* *celebartis*   *a*   *sollumnu*[1]
      say.PERF.3SG God to.3PL   that celebrate.PAST.SUBJ.3PL   his   feasts
      'God said to them that they should celebrate his feasts'   (Ml 102^{d}3)

Although unmarked VSO word order is common within the Celtic language family, it is rare within Indo-European, and also within the languages of the world.

A further idiosyncratic feature of Old Irish is its double system of verbal inflection. The form of the verb differs depending on its position in the clause. In the case of simple verbs, the verb differs in terms of its inflectional ending. When the verb is in absolute initial position in the clause it has absolute inflection:

(3)   *léicid-som*   *cloich* *asa*   *tailm*
      release.PRES.3SG.ABS-emph.part.3SG.M   stone   out-of-his   sling
      'He releases a stone out of his sling…'   (LU 6210–6211)

When the verb is in non-initial position, for example when it is preceded by a so-called 'conjunct particle' (e.g. a complementizer or a negative or interrogative particle), the verb has conjunct inflection:

(4)   *cenid*   *leci*   *in*   *metur*…
      although.NEG allow.PRES.3SG.CONJ the   metre…
      'Although the metre does not allow…'   (Ml 30^{a}10)

The verbs given in examples (3) and (4) are identical in terms of person, number, tense, aspect and mood. The different forms, *léicid* and *leci,* result purely from their different positions in the clause. The distinction between absolute and conjunct is present in virtually all persons. This can be seen in the paradigms for the present tense of *léicid* 'lets', *marbaid* 'kills' and *berid* 'carries' given in table 1 below:

(Table 1)   The present tense of *léicid* 'lets', *marbaid* 'kills' and *berid* 'carries'

	Absolute	Conjunct		Absolute	Conjunct		Absolute	Conjunct
1sg	léiciu	-léiciu	1sg	marbu	-marbu	1sg	biru	-biur
2sg	léici	-léici	2sg	marbai	-marbai	2sg	biri	-bir
3sg	léicid	-léici	3sg	marbaid	-marba	3sg	berid	-beir
1pl	léicmi	-léicem	1pl	marbmai	-marbam	1pl	bermai	-beram
2pl	léicthe	-léicid	2pl	marbthae	-marbaid	2pl	beirthe	-berid
3pl	léicit	-léicet	3pl	marbait	-marbat	3pl	berait	-berat

In addition to simple verbs, Old Irish also has a large number of compound verbs. Compound verbs consist of a simple verb plus one or more preverbs. Preverbs are particles etymologically related to prepositions that change the meaning of the verb in generally unpredictable ways. For example, the compound verb *fo-reith* 'helps' consists of the simple verb *reithid* 'runs' and the preverb *fo* 'under'.

Unlike simple verbs, compound verbs show no variation in terms of their endings. Compound verbs always have conjunct inflection. However, in different clausal positions

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[1]   In this example the conjunction *ara^n* 'in order that' functions as a generic 'that' complementizer. This usage is not very frequent in Old Irish. See Ó hUiginn (1997) for discussion.

compound verbs have different stems. When a compound verb appears in absolute initial position in the clause, it is deuterotonic, so called because the stress falls on the second syllable:

(5)   *do-<u>beir</u>*   *in fer*   *in claideb*   *don*   *macc*
      gives.DT   the man   the sword   to.the   boy
      'The man gives the sword to the boy'

When a compound verb is in non-initial position, it is prototonic, i.e. the stress falls on the initial syllable, the regular Old Irish stress pattern.

(6)   *ní*   *tabair*   *in*   *fer*   *in*   *claideb*   *don*   *macc*
      NEG   gives.PT   the   man   the   sword   to.the   boy
      'The man does not give the sword to the boy'

Deuterotonic and prototonic forms differ from one another to a great extent. This can be seen in table 2 below.[2]

(Table 2)   The present tense of *do-beir* 'gives', *ad-cí* 'sees' and *do-gní* 'does'
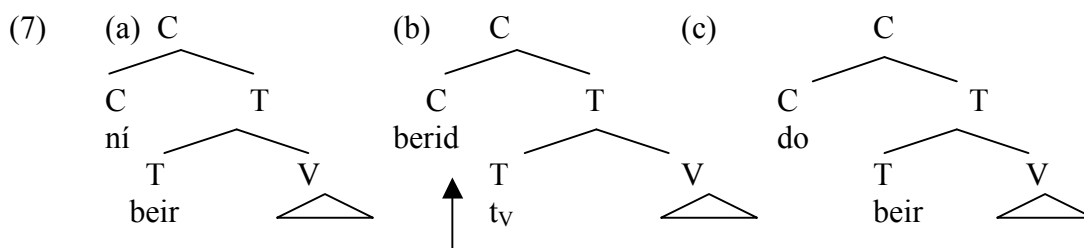
	Deuterotonic	Prototonic		Deuterotonic	Prototonic		Deuterotonic	Prototonic
1sg	do-biur	-tabur	1sg	ad-cíu	-aicciu	1sg	do-gníu	-dén(a)im
2sg	do-bir	-tabair	2sg	ad-cí	-aci	2sg	do-gní	-dén(a)i
3sg	do-beir	-tabair	3sg	ad-cí	-aicci	3sg	do-gní	-dén(a)i
1pl	do-beram	-taibrem	1pl	ad-ciam	-accam	1pl	do-gníam	-dénam
2pl	do-berid	-taibrid	2pl	ad-ciid	-accid	2pl	do-gníith	-dénid
3pl	do-berat	-taibret	3pl	ad-ciat	-accat	3pl	do-gníat	-dénat

3   WHY SYNTAX ALONE CANNOT ACCOUNT FOR THE OLD IRISH VERB

The main existing syntactic account of the Old Irish double system of inflection is that of Carnie, Harley & Pyatt (2000 – hence CHP). CHP build on the basic insight that the different verbal forms are linked to different positions in the clause, by arguing that the verb is spelled out differently depending on its syntactic position. CHP assume that absolute inflection is associated with the C position. Therefore, only when the verb is in C will it have absolute inflection. In any other syntactic position it will have conjunct form.

   CHP propose that Old Irish has a filled C requirement, in other words C must receive a phonological realisation. Since Chung & McCloskey (1987) it has been widely assumed that conjunct particles are complementizers. This being the case, we would expect them to be merged in the C position. Therefore, whenever there is a conjunct particle, C is necessarily filled, and the filled C requirement is satisfied. As a result the verb appears in T and has conjunct inflection. When there is no conjunct particle merged in C, however, some other element must move to fill C. When the verb is compound and there is no conjunct particle, the initial preverb of the compound verb moves to fill the C position. In this case the remainder of the verb stays in T, and so has conjunct inflection. When the verb is simple, however, and there is no conjunct particle in C, the whole verb moves from T to C, and so is spelled out with absolute inflection. This is shown schematically in the trees below:

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[2]   The phonological differences between deuterotonic and prototonic forms are a result of sound changes affecting the different forms differently because of the difference in stress. See McCone (1997) for details.

(7)   (a) C   (b)   C   (c)   C

        C   T   C   T   C   T
        ní   berid   do
            T   V   T   V   T   V
            beir   △   t_V   △   beir   △

The idea that different verbal forms can be linked to different syntactic positions is theoretically appealing. However, there must also be empirical data to support this view. This is the topic of the next section.

3.1 A closer look at simple verbs – the empirical evidence

CHP invoke two types of evidence to support their claim that simple verbs in Old Irish raise to the C position, namely object pronouns and relative constructions. We will examine each of these in turn.

3.1.1 Object pronouns

As in many other Indo-European languages, object pronouns in Old Irish are enclitic and always appear in second position. If the verb form is simple and in initial position, the object pronoun is suffixed to it, as in (8). If the verb follows a conjunct particle, the object pronoun is infixed between the conjunct particle and the verb, as in (9). If there is no conjunct particle and the verb is compound, the object pronoun is infixed between the initial preverb and the remainder of the verb, as shown in (10).

(8)   *berth-i*   *leis*   *co*   *cenn*
       bear.3SG.FUT- SUFF.3SG.M   with.3SG.M   to   end
       'He will bear it with him to the end'   (Wb 23[a]19)

(9)   *ní-m*   *charat-sa*
       NEG-INF.1SG   loves.PRES.3PL.CONJ-emph.part.1SG
       'They do not love me'   (Wb 5[c]6)

(10)   *du-s*   *n-gní*
       PVB-INF.3SG.F makes.3SG.PRES.DT
       'He makes it (f)'   (Ml 29[a]3)

According to syntactic accounts of clitic placement, object clitics have a set position in the clause (Kayne 1991). In many languages object pronouns seem to appear between C and T (see Kayne 1975, 1991, 1994, Cardinaletti & Roberts 2002 on Romance; Grohmann 2000 on dialects of German; Ackema & Neeleman 2005 on Middle Dutch). As clitics appear between these two functional projections, it is not entirely clear to which they belong. Cardinaletti & Roberts (2002) argue that clitics move to the left edge of the T complex. Uriagereka (1995) argues that they move to a projection, FP, which encodes point of view and is part of the C-projection. A full discussion of the target for and motivation behind clitic placement is beyond the scope of this paper. Crucially, object pronouns in Old Irish seem to occur in a similar position to those found in other European languages. If we consider the example given in (9) above, we find that the pronoun appears between the conjunct particle, a C element (Chung & McCloskey 1987) and the verb, in T. This suggests, that as in other European languages, object clitics in Old Irish appear between C and T. For concreteness it will be assumed that these pronouns occupy the lowest projection of the CP, equivalent to Rizzi's FinP. If this is

the case, and the position of the clitics remains constant, then this supports CHP's analysis of simple verbs. CHP argue that when the verb is simple object pronouns appear to its right and are suffixed to it; this is what we would expect if the verb had raised to C.

The evidence from object pronouns, however, is not as clear-cut as CHP suggest. Crucially, the use of suffixed pronouns in Old Irish is restricted. Generally only third singular forms of the pronoun are found attached to third singular indicative verb forms, and even in these cases suffixed pronouns are not used consistently. The productive pattern in Old Irish seems to be infixation using the dummy preverb *no*.

(11)   (a) *no-s   nguid-som*
           PVB-INF.3PL beseech.PRES.3SG.CONJ-emph.part.3SG.M
           'He beseeches them'   (Wb 25ᵇ9)
       (b) *ni hed   no-t   beir   i   nem*
           NEG it   PVB-INF.2SG carry.PRES.3SG.CONJ in   heaven
           'It is not this that brings you into heaven'   (Wb 6ᶜ9)

The restricted use of suffixed pronouns in Old Irish is problematic for CHP in two respects. First, the fact that suffixed pronouns are not productive and are only used in restricted contexts means that they do not provide convincing evidence that simple verbs move to C. The second, and perhaps more serious, problem is that CHP must be able to account for the productive pattern. It seems to be the case that when there is an object pronoun present V-to-C movement is blocked. One way to explain this could be to say that the infixed pronoun satisfies the filled C requirement (except in certain numbers and persons). However, if this is the case, then we would expect movement of the initial preverb to C also to be blocked when there is a pronoun and that does not seem to be so. As we saw in example (10) above, when the verb is compound, the pronoun appears between the preverb and the verb (see Newton 2006, 2008 for further discussion). Similarly it could be argued that the dummy preverb *no* is merged into the C position whenever there is an infixed pronoun, and this satisfies the filled C requirement and prevents verb-movement to C. However, again this does not occur with compound verbs. If *no* were inserted with the pronoun we would expect this to be the case across the board, and so again movement of the initial preverb of the compound verb would also be blocked.

It seems, then, that instead of providing evidence to support CHP's view, object pronouns pose a significant problem for it. In the regular, productive case simple verbs clearly do not move to C when there is an object pronoun, as they appear with the dummy preverb *no*. Under CHP's theory there seems to be no satisfactory explanation as to why V-to-C movement is blocked in these cases. If, on the other hand, there is no filled-C requirement in Old Irish so the verb never moves to C and only ever moves as far as T, then the productive system is easily accounted for and it is only the irregular suffixed forms that require extra explanation.[3] A theory that accounts primarily for the regular construction seems clearly preferable to one that focuses on the irregular one. The evidence from object pronouns, then, is better accounted for if it is assumed that there is no filled-C requirement and the verb in Old Irish only raises as far as T.

3.1.2 Relative clauses

The second piece of evidence invoked by CHP is that of relative marking. In Old Irish there are many different ways to mark a relative clause (see Thurneysen 1946: 312–325; McCone

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3   This is reasonably straightforward. The irregular nature of suffixed pronouns can be accounted for if we assume that the combination of verb+suffix is learnt by rote as an irregularity and inserted into the appropriate syntactic context, rather than being derived through a regular syntactic process of cliticization.

1980; Ó hUiginn 1997). One way that a clause can be marked as relative is to use a special relative form of the verb. This can be seen in example (12) below, where the non-relative form would be *gaibid* 'takes, seizes'.

(12)   *is   oinfer   gaibes   búaid diib   inna chomalnad*
        COP one man   take.PRES.3SG.REL   victory of.3PL in its completing
        'It is one man of them that gets victory for completing it'   (Wb 11ᵃ4)

As noted above, relative clause marking is associated with the C position so the fact that special relative morphology is only found on simple verbs in absolute clause-initial position supports the idea that simple verbs move to C in Old Irish.

　　　Like suffixed pronouns, special relative verb forms in Old Irish are restricted in distribution to verbs in the third person and, in the earliest texts, first plural (Thurneysen 1946: 313). In all other persons when there is no special relative form, the dummy particle *no* is inserted, which either lenites or nasalizes the initial segment of the verb and causes it to have conjunct inflection, as shown in the examples in (13).

(13)   (a) *is   hed   in so   no   chairigur* (non-rel *cairigur*)
            COP it   this   PVB   reprimand.PRES.1SG.CONJ
            'This is what I reprimand'   (Wb   11ᵈ1)
        (b) *cid no   mbetha* (non-rel *betha*)
            whyPVB   be.PAST.SUBJ.2SG.CONJ
            'Why (is it that) you should be?'   (Wb 4ᶜ24)

It seems on closer inspection, then, that instead of supporting CHP's theory, the evidence from special relative forms is problematic. As is the case for suffixed pronouns, the special relative verb forms are so restricted that they cannot provide convincing evidence that simple verbs move to C. Moreover, CHP must be able to account for these restrictions, explaining why movement to C is blocked in the majority of relative contexts. This could perhaps be explained if we argue that a relative feature in C satisfies the filled C requirement or that *no* is inserted into the C position in relative contexts, preventing verb-movement to C. However, as was the case with object pronouns, a relative feature in C does not stop the initial preverb of a compound verb from appearing in C. As with object pronouns, it seems that in relative contexts, the productive pattern seems to be that where the verb only moves as far as T and the cases that seem to demonstrate V-to-C movement are exceptions, suggesting that we should not postulate a filled-C requirement for Old Irish.

　　　There is further evidence from relative clauses to suggest that the verb only moves as far as T in Old Irish. The most common way to mark a relative clause in Old Irish is through lenition. When the verb is compound, lenition affects the segment after the initial preverb, as shown in (14).

(14)   *a   n-   ad-chiam* (non-rel *ad-ciam*)
        that   NAS   PVB-see.PRES.1PL.DT
        'That which we see'   (Ml 112ᵇ13)

When the verb is simple and a special relative form is unavailable, the dummy preverb *no* is inserted and the initial segment of the verb is lenited, as in (15) below.

(15)   *is   hed   in so   no   chairigur* (non-rel *cairigur*)
        COP   it   this   PVB   reprimand.PRES.1SG.CONJ
        'This is what I reprimand'   (Wb 11ᵈ1)

These data can be made sense of if we assume that when C is specified as relative it causes lenition of the initial segment of the following word.[4] Crucially, the particle that appears in the C position is not lenited. If special relative verb forms move to C, then, we would expect them not to be lenited. Although this is the case in the earliest sources of Old Irish, by the time of the Milan Glosses (AD 800) we find that simple relative verb forms begin to undergo lenition. This becomes widespread by the St Gall Glosses (AD 850) (Thurneysen 1946: 315):

(16)   (a) *indí*   <u>*ch*</u>*omallaite* (non-relative <u>*c*</u>*omallait*)
           those   fulfil.PRES.3PL.REL
           'Those who fulfil.'   (Ml 114^{b}7)
     (b) *cisí*   *aimser derb*   <u>*th*</u>*echtas* (non-relative <u>*t*</u>*echtaid*)
           what   time   definite   possess.PRES.3SG.REL
           'What is the definite time that he has?'   (Sg 26^{a}6)

This development suggests that although historically special relative verb forms were in the C position and so unlenited, by the time of the Milan Glosses this is no longer the case. The fact that such verb forms are unlenited in the Würzburg Glosses written some fifty years earlier could imply that V-to-C movement was lost between these 750 and 800. Alternatively, and perhaps more likely, V-to-C movement may have been lost before the time of the Würzburg Glosses, but it was not until the time of the Milan Glosses that the full effects of this change came to be seen in the written language.

3.2 Summary

Although CHP's analysis of absolute and conjunct inflection in Old Irish is theoretically appealing, the empirical evidence does not seem to support it. The evidence that CHP provide from object pronouns and relative constructions, when considered more closely, not only fails to support their analysis but also poses significant problems for it. It is difficult to account for the use of *no* to infix pronouns and mark relative clauses within a theory that postulates across the board V-to-C movement. In both cases the productive pattern seems to show that the verb only moves as far as T. The examples that seem to show V-to-C movement are marginal and irregular in the Old Irish period. These data seem better accounted for if the verb only moves as far as T in Old Irish. The irregular forms that appear to demonstrate V-to-C movement are archaisms from an earlier period, when V-to-C movement was productive.

     Before we move on there is a further piece of evidence that could be taken to support the view that simple verbs only raise as far as T in the syntax, namely stress patterns. Generally all other elements that CHP propose can fill the C position in Old Irish are unstressed, i.e. conjunct particles and the initial preverbs of deuterotonic compound verbs (Thurneysen 1946: 28–30). This being the case, if a fronted verb appears in the C position we might expect it to be unstressed. If, on the other hand, the verb only ever moves as far as T, then we have a unitary explanation for the stress patterns of the Old Irish verbal complex, namely stress always falls on the first syllable of TP.

     So it seems that there is good reason to believe that simple verbs do not move to C in Classical Old Irish. However, if simple verbs only ever move as far as T in the syntax, then the different morphological endings cannot reflect different syntactic positions. This means that we need an alternative explanation for the different morphological forms. This is the topic of section 4.[5]

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[4]   A similar analysis has been provided for relative clauses in Modern Irish. The main difference is that in Modern Irish relative C is phonologically realised as a particle *a* that either lenites or nasalizes the following word (McCloskey 2001, 2002)

[5]   CHP's account also faces numerous theoretical problems, specifically in terms of the derivation of compound verbs. See Newton (2006: 36–49) and Adger (2006: 620–627) for further details.

4   A NEW POST-SYNTACTIC ACCOUNT OF THE OLD IRISH VERB

In section 3 it was argued that the verb in Old Irish never raises higher than T. If this is the case, then the different morphological forms cannot be a result of different syntactic positions, as CHP suggest. It seems we need more than syntax to account for the distribution of absolute and conjunct endings in Old Irish. We need some kind of post-syntactic processes. Let us consider, then, what these post-syntactic processes might be.

4.1 The syntax-phonology interface

Post-syntactic operations can be divided into two kinds, those that are conceptually motivated and so must occur in all languages, and those that are empirically motivated and only occur in individual languages. Let us examine each in turn.

   According to Chomsky's architecture of the grammar, after syntax is complete, the derivation proceeds to the phonological component. However, the structures manipulated by syntactic operations are somewhat different to those manipulated by phonology. Syntactic structures are hierarchical, whereas phonological structures are flat. Furthermore, syntactic operations refer purely to morphosyntactic features, whereas phonological operations refer only to phonological features (Chomsky & Halle 1968). Therefore, after syntax is complete, but before phonology begins there are two post-syntactic operations that must take place in all cases: hierarchical syntactic structures must be linearized and (assuming Distributed Morphology) morphosyntactic feature bundles must be replaced by phonological feature bundles.

   Chomsky (1995a: 340) argues that the operation responsible for the linearization of syntactic structure might be Kayne's (1994) Linear Correspondence Axiom (LCA). For Chomsky the LCA is operative at the syntax-phonology interface and is responsible for the conversion of the hierarchical output of syntax to the linear order found in phonology.[6] We will follow Chomsky on this point and little more will be said about it below.

   The idea that syntactic operations make no reference to phonological features, and phonological operations make no reference to morphosyntactic features can be easily explained if we assume that there are no phonological features present in the syntax, and no morphosyntactic features present in phonology. This is one basic assumption behind Distributed Morphology (DM – Halle & Marantz 1993, 1994). DM assumes an operation Vocabulary Insertion, which takes place at the syntax-phonology interface and replaces morphosyntactic feature bundles with phonological exponents. More will be said on this operation below.

   So far we have outlined two post-syntactic operations that must take place cross-linguistically to convert syntactic structure to phonological structure, namely Linearize and Vocabulary Insertion. However, there is a further conceptually necessary post-syntactic operation, namely Chain Reduction.

   If, following Chomsky (1995a, 2000 et seq.), we adopt a copy theory of movement, then at the output of the syntax the derivation will contain multiple copies of any element that has been moved. Chomsky (2001) argues that Move can be seen as Internal Merge. The element to be moved is copied and remerged in the higher position. So, for example in a passive construction, such as (19), the object *John* is merged as the complement of the verb, in the VP, and then copied and remerged in the subject position.

(17)   [$_{TP}$John was [$_{VP}$kissed t$_{John}$]]

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6   Kayne (1994) maintains that the LCA is operative throughout the syntax.

At the output of syntax, then, there will be two copies of the DP *John*. However, only one of these copies can be phonologically realised as sentences of the type **John was kissed John* are ungrammatical.[7] This suggests that there must be some operation that marks one copy of a set of identical elements to be realised and deletes the subsequent copies. This operation, which we will term Chain Reduction, marks the leftmost, or highest copy of the element in question for realization and deletes the lower copies (see Brody 1995, Pesetsky 1997, Nunes 1999, 2004, Bobaljik 2002).[8]

So far it has been argued then, that the syntax-phonology interface contains three necessary operations: Linearize, Chain Reduction and Vocabulary Insertion. These operations are conceptually motivated, and so must take place in all languages. Within DM, however, there are a number of further operations that are argued to take place between syntax and phonology. These operations manipulate the output of syntax, changing the morphosyntactic feature structure of syntactic terminals and so influencing the way that these terminals are realised phonologically (e.g. fission, fusion, impoverishment see Halle & Marantz 1993, Harley & Noyer 1999 for further details). These operations operate only in particular contexts in particular languages, and so are harder to justify.

A truly minimalist theory of the syntax-phonology interface will include only operations that are conceptually motivated. Let us examine now whether such an interface can account for the Old Irish verbal system.[9]

4.2 The absolute/conjunct distinction

We saw in section 3 above that the main problem for CHP's syntactic account of the Old Irish verbal system is the use of object pronouns with simple verbs. Crucially it is difficult for CHP to account for the regularly attested, productive pattern, namely the use of an infixed pronoun and a dummy preverb *no*:

(18) (a) *no-s*   *nguid-som*
            PVB-INF.3PL   beseech.PRES.3SG.CONJ-emph.part.3SG.M
            'He beseeches them'   (Wb 25[b]9)

      (b) *ni   hed   no-t   beir   i   nem*
            NEG   it   PVB-INF.2SG carry.PRES.3SG.CONJ in   heaven
            'It is not this that brings you into heaven'   (Wb 6[c]9)

If we consider this construction more closely, it seems that there is reason to believe that the behaviour of verbs in Old Irish is in some respects parallel to that of English verbs.

It is well known that in English verbs do not raise to T. Instead, it seems that tense and subject agreement inflections 'Affix-Hop' from T to V (Chomsky 1957). When an element, such as the negative *not*, intervenes, the tense and agreement inflections cannot hop and are stranded in T. In this environment we find a dummy auxiliary *do* is inserted to provide a host

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[7]   Although see McDaniel (1989) and Nunes (1999) for examples of so-called multiple Spell-Out.

[8]   Nunes (1999, 2004) attempts to explain why this should be the case, whereas others simply stipulate. It could simply be a principle of the grammar that the leftmost copy of identical feature sets is realised. If the Spell-Out of syntactic terminals operates from left to right, then it could simply be the case that as a maximally economical operation, Spell-Out simply ignores subsequent copies of an element it has already spelled-out.

[9]   For an alternative post-syntactic account of the Old Irish verbal system see Adger (2006). Adger's account makes use of post-syntactic movement (cf. Embick & Noyer 2001). Under the approach to the syntax-phonology interface presented here, post-syntactic movement is an example of an empirically motivated post-syntactic operation. For a discussion of the empirical and theoretical problems faced by Adger's approach, see Newton (2006: 52–60)

for the affixes. A parallel situation could be envisaged for Old Irish. As we saw in section 3, there is evidence to suggest that in Old Irish the verb does not raise to C; instead absolute inflections Affix-Hop from C to T. When an infixed pronoun is present, this prevents Affix-Hopping and so the dummy preverb *no* must be inserted to host the absolute inflections in C. If this parallel holds then we should be able to account for English and Old Irish in the same way.

Traditionally Affix-Hopping has been viewed as problematic as it involves downward movement. Downward movement is prohibited in the syntax, as a moved element must c-command its trace.[10] Under the current version of minimalism, however, an alternative analysis is available. The appearance of tense and subject-agreement-(φ)-features on the verb in its base position can be seen as a result of the operation Agree (Chomsky 2000 et seq). T and V both have tense and φ-features. When these features enter the derivation they are different in terms of their value. The tense and φ-features on T are valued, whereas those on V are unvalued. During the syntax, the operation Agree values unvalued features, therefore, after Agree has taken place the tense and φ-features on T will be identical to those on V. At the point of Spell-Out, one set of these features receives a phonological realisation. What appears to be downward movement, then, is the realisation of these tense and φ-features on V rather than T. The implementation of an Agree relation between V and T can explain how tense and φ-features can be present on both V and T, and so can potentially be realised in either position; however, this does not explain why these features are sometimes realised in V and sometimes in T.

It is perhaps possible to account for the position in which tense and φ-features are realised through the operation of Chain Reduction. In section 4.1 we saw that in canonical cases Chain Reduction marks the leftmost copy of a moved element for realisation and deletes all subsequent copies. To account for Affix-Hopping as proposed above, the concept of Chain Reduction needs to be extended so that it applies not only to movement chains but also to features in an Agree relation. At first sight this seems problematic. Once feature valuation has taken place between two features there is no link between them; therefore, we cannot talk about chains between valued features. However, Chomsky also makes such a claim about moved elements. Chomsky (2001: 11) suggests that chains cannot be considered 'real', as the postulation of chains or indices to mark multiple instances of a moved element would violate the Inclusiveness Condition. If there is no concrete link between moved elements how does the operation Chain Reduction know which of these elements form a chain and should be subject to deletion? The two main possibilities are identity and c-command.[11] After feature valuation has taken place, a pair of features in an Agree relation will by necessity be identical. Furthermore, in order for an Agree relation to take place in the first place the Probe and Goal must be in a c-command relation.[12] So, it seems that the identical features resulting from Agree fulfil the same requirements as moved elements in terms of Chain Reduction.[13]

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[10]   Embick and Noyer (2001: 584–591) and Bobaljik (2002) account for Affix-Hopping via Lowering, a type of post-syntactic movement. As post-syntactic movement falls under the category of an empirically motivated post-syntactic operation, we will not examine this approach here.

[11]   Nunes (1999) argues that chains cannot be determined in terms of identity as, if this were the case, why is one occurrence of *John* not deleted in sentences such as *John$_i$ hit John$_j$*. Clearly each instance of *John* has a different referent, and they are, therefore, distinct. However, it is not clear how this should be accounted for within the syntax.

[12]   Chomsky does not explicitly mention c-command in his definition of Agree, however, he does state that the Probe searches for a Goal in its domain/complement. This will result in a c-command relation between Probe and Goal.

[13]   It is plausible that in some situations more than one instance of a pair of valued features will be phonologically realised. However, this also occurs in movement chains, for example in cases of multiple Spell-

Under this revised view of Chain Reduction then we would expect the tense and φ-features to be realised in the highest or leftmost position, namely T. However, as we saw above, this is not always the case. Let us consider the operation Chain Reduction in more detail. So far it has been assumed that Chain Reduction is a post-syntactic operation, and the decision as to which copy is marked for realisation is determined at the PF-interface.[14] If this is the case, then it seems plausible that this decision should be determined by PF requirements (Landau 2006: 54):

(19)   (a) PF copies that are demanded by PF requirements cannot be deleted
           (b) PF copies that are excluded by PF requirements must be deleted

For example, Franks (1999) argues that second-position clitics in Serbo-Croatian move to C in the syntax and are usually spelled-out there. However, these clitics need a host to their left. If no such host is available the top copy, i.e. that in C, cannot be realised, and a lower copy is spelled-out instead. Similarly, Bobaljik (2002) argues that in cases of object shift, the highest copy of the object cannot be realised if it appears between V and T. V and T must be string adjacent in order for morphological merger to take place. An intervening object that interrupts this adjacency requirement cannot be realised, and so a lower copy will receive a phonological realisation instead.

It seems that a similar argument could be made for the spell-out of tense and φ-features in English. If, as is often assumed, tense and φ-features in English are affixes, then in order to be realised they must have a host, i.e. they must satisfy the Stranded Affix Filter (SAF – Lasnik 1981, 1995). The SAF can be seen as a PF requirement (Halle & Marantz 1993; Lasnik 1995; Bobaljik 2002; Landau 2006). Therefore, if at PF, tense and φ-features have no host and are stranded in T they cannot be realised there, and so the lower copy in V will be spelled-out instead, resulting in Affix-Hopping. So, it seems then we have the beginnings of an explanation as to why tense and φ-features are sometimes spelled-out in T and sometimes in V. However, there are several aspects of the above proposal that are in need of further clarification. First, what exactly does it mean for a feature to be an affix? Second, what constitutes 'a host'? In other words, how is the SAF satisfied? Let us examine each of these issues in turn.

The first issue to be addressed is what it means for an entity to be an affix. If, as suggested above, the SAF is a PF-requirement, operative at the syntax-phonology interface, then [affix] cannot be a purely phonological property, as the SAF must be satisfied before the phonological features enter the derivation. Halle & Marantz (1993) argue that Vocabulary Insertion, i.e. the replacement of morphosyntactic features with phonological features, is the last stage in the post-syntactic component, marking the beginning of phonology proper (see also Ackema & Neeleman 2005: 185–6). At the point of Chain Reduction, then, phonological information is not yet available. Therefore, the property [affix] must be encoded in the morphosyntactic features.

There is empirical evidence to suggest that affixation is not purely a phonological process. In addition to their obvious phonological deficiency, affixes also seem to show a certain level of syntactic dependency. Unlike clitics, which can in many cases appear freely with any type of host, affixes tend to be restricted in their distribution, appearing only in a particular syntactic position with a particular type of host (Zwicky & Pullum 1983: 504–5). Often, if a clitic's phonological requirements are not met, it seems that it can move in the

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Out in German (McDaniel 1989). This can be explained through some independent phonological requirement demanding that the lower copy be realised (Landau 2006).

[14]   Landau (2006) argues that this is a result of the modular nature of the grammar – the decision as to which copy to pronounce/interpret is determined at PF/LF respectively, as there can be no interaction between the two.

phonology to find an appropriate host (so-called Prosodic Inversion – Halpern 1995). This is not generally true of affixes.[15] This suggests that affixation, or at least part of affixation, takes place before the insertion of the phonological material, and so the property [affix] must be specified in the morphosyntactic features. It will be assumed in what is to follow that [affix] is a morphological property that is associated with individual features, i.e. a morphological subfeature relevant at the PF-interface.

Having established what it may mean for an entity to be an affix, let us now consider what may constitute a host and how the SAF can be satisfied at PF. It was argued above that [affix] is, at least in part, a morphosyntactic property, therefore affixation must be, at least in part, a morphosyntactic operation. A feature that is specified morphosyntactically as [affix] requires a morphosyntactic host. What this means, I propose, is that it must be able to combine in the syntax or the post-syntactic component with another morphosyntactic feature. In the simplest case, what this means is that a feature with the property [affix] will satisfy the SAF if it appears under the same syntactic terminal node as another morphosyntactic feature.[16] One final question that must be raised is whether the morphosyntactic feature that provides a host for the affixal feature requires any specific properties. I would suggest that the only requirement is that the feature in question has a positive value. By the PF-interface, where the [affix] feature is relevant, all morphosyntactic features will necessarily have been valued by the syntactic operation Agree. However, these values are not necessarily positive. If a feature has its default value, then it could be argued that its feature specification is 0. For example, present tense, third person, singular number could all be seen as a lack of a positive value. Features that lack a positive morphosyntactic value can have an LF interpretation and can also be realised at PF; however, I propose, they cannot play a role in the post-syntactic, morphological component (see Harley 1994, Harley & Ritter 2002 for a similar proposal).

Having outlined our basic assumptions regarding the nature of affixation, let us return to the case in hand, namely tense and φ-features in English. These features in English are morphosyntactically specified as [affix]; therefore, in order to satisfy the SAF and receive a phonological realisation they must occur under the same terminal node as at least one other non-default-valued feature. When there is an aspectual or modal auxiliary in English, there will clearly be aspectual or modal features in T. Therefore, the [affix] property will be satisfied, and the tense and φ-features will be realised in T and deleted in V. When there is no aspectual or modal auxiliary, for example in the simple present or simple past tenses then there will be no positively-valued features with which the tense and φ-features can combine, and as such they cannot be realised in T and are spelled-out in V. It seems, then, that by implementing the SAF Affix-Hopping in English can be accounted for by the operations Agree and Chain Reduction. Before we consider the related phenomenon of *do*-support, let us turn to Old Irish.

It was argued in section 3 above that the verb in Old Irish does not raise above T. Therefore, to account for the appearance of absolute morphology on the verb we seem to have a case of downward movement parallel to Affix-Hopping. When C is not filled by a conjunct particle the absolute verbal endings move from C to T. As with Affix-Hopping above, this could also be seen as a result of Chain Reduction. If the feature conditioning absolute inflection appears in both C and T, and like tense and φ-features in English has the property [affix], the position in which it appears will be determined by the morphosyntactic features contained in C and T. When C contains positively-valued morphosyntactic features, these will

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[15]   The distinction between affixes and clitics is not clear-cut. There is a tendency within the DM literature to assume that there is no distinction between them. It is perhaps possible that a distinction can be drawn between entities that are specified as morphosyntactically affixal and those that are phonologically affixal. However, we will not go any further into this issue here.

[16]   This does not rule out the possibility of post-syntactic operations such as Morphological Merger in the sense of Marantz (1988). This may be an alternative way in which the affixation requirement can be met. However, we will not investigate this possibility further here.

provide a morphosyntactic host for the affixal features, satisfying the SAF and allowing the realisation of these features in the leftmost position. When C contains no positively-valued features, however, the affixal features cannot be realised in C, as a result of the SAF, and so will be spelled-out in T. Let us consider this proposal in more detail.

The first issue to consider is what the feature(s) shared by C and T in Old Irish might be. Absolute inflections express subject agreement; therefore we would expect them to be a realisation of φ-features. However, conjunct inflections also mark subject agreement, and so there must be some factor that distinguishes the two. Under CHP's view, the difference between absolute and conjunct inflection could simply be a result of the fact that the verb occupies different syntactic positions, with φ-features being spelled-out as absolute inflection when they appear with a verb in C and as conjunct when they appear with the verb in T. However, as we saw in section 3 above, there is evidence to suggest that the verb does not raise above T in Old Irish. If this is the case, then φ-features will always be realised on the verb in T, and so the distinction cannot be explained in this way.

A further possibility is that absolute endings are the realisation of φ-features combined with some other feature. It is difficult, however, to determine exactly what this feature might be, as the double system of verbal inflection seems to have no clear function in the Old Irish period.[17] One possibility is that it is a force feature. As we saw in section 3.1.2 above, in certain numbers and persons absolute verb forms can show special relative endings. The existence of relative and non-relative absolute endings could be seen as the presence of relative and non-relative force features in the T position. When a relative force feature combines with T's φ-features this results in special relative morphology, and when a non-relative force feature combines with T's φ-features this results in absolute morphology. We will assume for what follows that the relevant feature that is shared by C and T is a force feature.[18]

In the case of Affix-Hopping in English it was argued that tense and φ-features were shared by T and V as a result of Agree. This may also be the case with the force feature in Old Irish. However, as this feature is shared by C and T there is an alternative possibility. Chomsky (2005, 2006) proposes that T enters the derivation with no features of its own and instead receives its features from the phase head C. Under this view, it is plausible that certain features could be shared by both heads.[19] It seems likely that this will be a matter of cross-linguistic variation. In English for example, tense and φ-features appear on T and not on C and so do not seem to be shared. In Germanic complementizer agreement constructions, however, we find φ-features on C, suggesting perhaps that they are shared by C and T (20). Similarly, in Modern Irish we find tensed complementizers alongside tensed verb forms, suggesting a shared tense feature (21).

(20)   (a) *ob-st*   *(du)*   *noch* *Minga*   *kumm-st*
           whether-2SG   (you)   to   Munich   come-2SG
           'Whether you come to Munich'   (Fuß 2005: 159)
     (b) *wem-ma (mia) aaf   Minga fon*
           when-1PL (we)   to   Munich drive
           'When we drive to Munich'   (Fuß 2005: 165)

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[17]   Although see Koch 1987; Isaac 2001.

[18]   There is also diachronic evidence to support the idea that absolute inflection results from a force feature. Newton (2006) argues that absolute endings developed due to the presence of a declarative clause-typing particle that was reanalysed as a verbal affix.

[19]   Chomsky is not entirely clear as to whether 'spreading' means 'sharing' or simply 'passing on'. The data seems to suggest, however, that sharing is a possibility.

(21) (a) *Níor   oscail   Cáit   an   geata*
          NEG.PAST   open.3SG.PAST Cáit   the   gate
          'Cáit did not open the gate'
      (b)*Deir   sé gur   oscail   Cáit   an   geata*
          say.3SG.PRES   hethat.PAST   open.3SG.PAST Cáit   the   gate
          'He says that Cáit opened the gate'

Let us assume, then, that the force feature in Old Irish, like tense in Modern Irish, is shared by both C and T. However, unlike tense in Modern Irish, force in Old Irish can only be realised in one position, like tense and φ-features in Modern English. Furthermore, like tense and φ-features in English, the force feature has the property [affix] and so can only be realised in a position where it satisfies the SAF.

It was argued above that in order to satisfy the SAF a feature that is specified as [affix] must appear under the same terminal node as an additional positively valued morphosyntactic feature. When a conjunct particle or the initial preverb of a compound verb appears in the C position this will provide positively valued morphosyntactic features with which the affixal force feature can combine. Therefore the SAF will be satisfied and the force feature will be realised in C and deleted in T, as shown in the tree below.[20]

(22)

```
            CP
          /    \
        C        TP           ⇒     [_C co-ø        [_T léici…]]
     Conj/Pvb   / \                  until-FORCE    allows.PRES.3SG.CONJ
    [Force_AFF] T   VP               'Until he allows'
             Verb  /\
            [T, φ]
           [Force_AFF]
```

When there are no other morphosyntactic features present in C, i.e. no conjunct particle and no preverb, force will have no host, and so as a result of the SAF cannot be realised there. In this case, C will be completely empty, and so will receive no realisation, and force will be realised in T, in conjunction with the φ-features, giving rise to absolute verbal inflection. This is shown in the tree below:

(23)

```
            CP
          /    \
        C        TP           ⇒     [_C ø      [_T léicid]]
    [Force_AFF]  / \                  allows.PRES.3SG.ABS
              T    VP                 'He allows'
            Verb  /\
           [T, φ]
          [Force_AFF]
```

So far in this section it has been argued that the appearance of absolute morphology in Old Irish is conditioned in a similar way to the well-known phenomenon of Affix-Hopping in English. Both constructions can be explained in current theoretical terms through the use of Agree (in the English case) or feature spreading (in Old Irish) and the post-syntactic operation

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[20]   When force is declarative it has no phonological realisation when it is spelled-out in C. When force is relative it can be realised as a special relative form of the preverb or as a relative complementizer, such as the negative relative *nad*. See Newton (2006) for further details.

Chain Reduction. In the second half of this section we turn to the second parallel between English and Old Irish, namely in the use of *do* in English and *no* in Old Irish.

Both *do* in English and *no* in Old Irish seem to have the status of last resort elements, used to provide a phonological realisation for a functional projection that for some reason needs be realised, but has no phonological realisation of its own. Neither *do* in English nor *no* in Old Irish are associated with a single meaning or function, and both can be used in a variety of environments. Let us consider each in turn.

There are 4 main constructions in which the dummy auxiliary *do* appears in the T position: namely negative clauses, emphatic clauses, VP ellipsis and VP raising, shown in the examples in (24).

(24)   (a) John does not know
       (b) John DOES know
       (c) John knows and Mary does too
       (d) Bob asked Mary to leave John, and leave him she did

Biberauer & Roberts (2008) argue that in all these contexts T contains a [+affective]-feature, a type of polarity feature. Polarity is often argued to be associated with T cross-linguistically (Laka 1990, Zanuttini 1997).[21] The example in (24a) is a negative clause, so it could be argued that T contains a negative polarity feature. In (24b) the auxiliary *do* is emphatic. In this case then, T could be argued to contain an emphatic-positive polarity feature. Although the auxiliary in (24c) and (24d) is not stressed as it is in (24b), there is evidence to suggest that in these environments, the auxiliary is still emphatic. For example, in cases of VP ellipsis and VP raising the auxiliary cannot be phonologically reduced, so sentences such as those in (25) are ungrammatical.

(25)   (a) *John has left and Mary's too
       (b) *She said she had left and left she'd

Emphatic auxiliaries cannot be phonologically reduced. This could explain why we do not find reduced auxiliary forms in VP ellipsis and VP raising constructions.

Clearly a [+affective]-feature on T will not always result in the insertion of *do*. When there are modal or aspectual features in T then T will be realised as a modal or aspectual auxiliary rather than *do*. In DM terms, this can be explained by the elsewhere principle. The auxiliary that matches the largest number of features in T will be inserted there. So, when there are modal or aspectual features on T, the more highly specified modal and aspectual auxiliaries (e.g. *will, can, must, is, have*) match the feature specification of T more closely and are chosen in place of *do*. When, however, there are no aspectual or modal features in T, then *do* will be inserted.

Biberauer & Roberts' account of *do*-insertion works well with the account of Affix-Hopping provided above. When T contains a [+affective]-feature there will be a positively valued morphosyntactic feature with which the affixal tense and φ-features can combine. Therefore, in all the environments where we find *do*-insertion the tense and φ-features can be realised in T and deleted in V.[22] Let us consider now whether we can account for *no*-insertion in Old Irish in a similar way.

The environments in which we find *no* in Old Irish are considerably more diverse than those in which we find *do* in English. The dummy preverb *no* is used with object pronouns, in relative clauses and when the verb has a secondary tense. We saw above that suffixed

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[21]   Although see also Déchaine & Wiltschko (2003) who propose a parametric difference between T- and C-related PolP.

[22]   Biberauer & Roberts (2008) propose a different view of Affix-Hopping.

pronouns are no longer productive in the Old Irish period and are used only in restricted circumstances. When there is no available suffixed form, the dummy preverb *no* is inserted and the pronoun is infixed between them as in (26). In this case *no* seems to be associated with the presence of an enclitic object pronoun.

(26)　(a) *no-s　　　nguid-som*
　　　　　PVB-INF.3PL beseech.PRES.3SG.CONJ-emph.part.3SG.M
　　　　　'He beseeches them'　　　　　　　　　　　　　　　　　(Wb 25^{b}9)
　　　(b) *ni　hed　no-t　　　beir　　　　　í　　nem*
　　　　　NEG it　　PVB-INF.2SG　carry.PRES.3SG.CONJ　in　　heaven
　　　　　'It is not this that brings you into heaven'　　　　　　(Wb 6^{c}9)

Turning to the relative clauses, we find that when there is no special relative form available, a relative clause is marked through the use of the dummy preverb *no* followed by either lenition, (27a), or nasalization, (27b).

(27)　(a) *is　hed　in so　no　　chairigur* (non-rel *cairigur*)
　　　　　COP it　　this　PVB　reprimand.PRES.1SG.CONJ
　　　　　'This is what I reprimand'　　　　　　　　　　　　　(Wb 11^{d}1)
　　　(b) *cid　no　　mbetha* (non-rel *betha*)
　　　　　why PVB　be.PAST.SUBJ.2SG.CONJ
　　　　　'Why (is it that) you should be?'　　　　　　　　　　(Wb 4^{c}24)

Due to cross-linguistically observed similarities with interrogative marking, relative marking is associated with the C position. As a result, we can assume that whenever the clause is relative, the C position will be specified with a feature [+wh]. So, in this case, *no* seems to be associated with a wh-feature.

The third case is that of secondary tenses. When a simple verb appears in the imperfect (28a), past subjunctive (28b) or the conditional (28c) and there is no conjunct particle, the dummy preverb *no* is inserted.

(28)　(a) *no　scarinn　　　　friu*
　　　　　PVB part.IMPF.1SG.CONJ　to.3PL
　　　　　'I should part with them'　　　　　　　　　　　　　(Wb 24^{a}4)
　　　(b) *cia　　nu　tiastais　　　　huaim*
　　　　　although　PVB　go.PAST.SUBJ.3PL.CONJ　from.1SG
　　　　　'Although they should go from me'　　　　　　　　　(Ml 117^{d}3)
　　　(c) *no　comallaibthe*
　　　　　PVB fulfil.COND.PASS.SG.CONJ
　　　　　'It would be fulfilled'　　　　　　　　　　　　　　(Ml 105^{b}14)

In these cases, *no* seems to be an aspectual particle.

It seems, then, that unlike English *do* there is no one feature that can account for all occurrences of *no*, not even a very general feature like Biberauer & Roberts' [+affective]. It seems, then, that Biberauer & Roberts account of *do*-insertion cannot be carried over to Old Irish. There are two possible alternatives. First, it could be argued that for each different environment in which *no* appears *no* is a different vocabulary item (VI), so in Old Irish there are three homophonous VIs *no*, one that realises C [+wh], one that realises C[+object$_{CL}$] and one that realises C[+aspect]. At first sight, this seems possible, but unappealing. If we consider the analysis in more detail, however, there seems to be a more serious problem. If the VI for *no* contains feature specifications of this kind, we might expect it to behave more like a conjunct particle; so whenever C contains an aspect or wh-feature we might expect *no* to be

inserted. However, this does not seem to be the case. The particle *no* appears only when there is no other element that could appear in the C position. This includes not only conjunct particles, but also, as we shall see in the next section, the initial preverbs of compound verbs.

An alternative is to characterise the particle *no* as an elsewhere morpheme. In this case, the appearance of *no* is not conditioned by any one feature in particular. The VI for *no* has no feature specifications, apart from the fact it can appear in C. In DM terms, *no* will always compete for insertion into the C position, but will only be inserted when there are no more highly specified VIs (i.e. conjunct particles or initial preverbs) that match the feature content of C more closely. When C contains a negative feature, or a conjunction feature or a preverb feature (see (29) below), the corresponding VI will be inserted. However, if none of these features are present, the elsewhere morpheme *no* will be inserted.

(29)   [C [+negative]] $\rightarrow$ ní
       [C [+conjunction]] $\rightarrow$ co^n, dia^n, ara^n
       [C [+preverb]] $\rightarrow$ do, fo, as, ro
       [C] $\rightarrow$ no

The characterization of *no* as an elsewhere morpheme accounts well for the intuition that it appears simply whenever it is needed; however, the VI for *no* listed above is perhaps slightly misleading. C is not, as (29) suggests, realised as *no* in all clauses where there is no conjunct particle and no initial preverb. We saw in the first half of this section that when C contains no features other than a declarative Force feature C receives no realisation at all. Let us consider now how these two scenarios can be reconciled.

The crucial point is that C is only realised as *no* when C contains an extra feature in addition to its default features. When C contains only its default features it receives no phonological realisation. One way to account for this could be to argue that there is a specific VI, such as that given below, that is in effect more specific than the elsewhere case, specifying that when C has its default features it is realised as null.

(30)   [C [Force$_0$ Finiteness$_0$ v$_0$]] $\rightarrow$ ø

However, this is problematic. Under the principles of Vocabulary Insertion, (Halle & Marantz 1993) the VI that matches the feature content of the terminal node most closely is inserted. When the C node is specified with an object clitic feature, it will have the feature structure given below (assuming it is non-relative and the verb is simple):

(31)   [C [Force$_0$ Finiteness$_0$ v$_0$ Object$_{Cl}$]]

This feature structure is more closely matched to the VI in (30) than that for *no* in (29) and so we would expect ø to be inserted rather than *no*.

If we return to the account of Affix-Hopping and absolute inflection presented above a new solution emerges. It was argued above that when C contains only an affixal Force feature this feature cannot be realised due to the SAF, as the affix does not have a host. If we further assume, however, that the SAF prevents not simply the Force feature, but the entire C head from receiving a phonological realisation, then we can perhaps explain the distribution of the null C and the elsewhere particle *no*. When C contains only an affixal Force feature, C is marked for deletion as it violates the SAF. Therefore, C cannot receive a phonological realisation and so is simply not considered during the spell-out of the syntactic terminals at Vocabulary Insertion. In this case, then, C is necessarily null as it does not even have the option of being spelled-out. When C contains an extra feature, the SAF is satisfied as the affixal Force feature has a host. Therefore, C is marked for realisation. It is considered by the operation Vocabulary Insertion and so is realised as the elsewhere particle *no*. Viewed in this

way the alternation between ø and *no* reflects whether the C head reaches the point of Spell-Out, and whether or not it is marked for deletion during the process of Chain Reduction. It seems then that the postulation of an affixal Force feature can account not only for the distribution of absolute and conjunct endings but also for the distribution of the particle *no*.

5   CONCLUSION

The main aim of this paper has been to show how we might begin to develop a more minimalist theory of the interface between syntax and phonology. In order to do this we have considered evidence from Old Irish. It seems that the complexities of the Old Irish verbal system cannot be accounted for by syntax alone. A new post-syntactic account has been proposed that uses only the conceptually motivated syntactic and post-syntactic operations of Agree, Vocabulary Insertion and Chain Reduction. The challenge for future research is to establish whether other syntactically complex data can be accounted for in a similar fashion.

ABBREVIATIONS

LU   *Lebor na hUidre (Book of the Dun Cow)*. Best R. & O. Bergin (eds.)(1929). Dublin: Dublin Institute for Advanced Studies.
Ml   Milan Glosses (in *Thesaurus Palaeohibernicus* ed. W Stokes & J Strachan Dublin, 1987)
Sg   Glosses on Priscian, St Gall (in *Thesaurus Palaeohibernicus* ed. W Stokes & J Strachan Dublin, 1987)
Wb   Würzburg Glosses (in *Thesaurus Palaeohibernicus* ed. W Stokes & J Strachan Dublin, 1987)

REFERENCES

Ackema, Peter and Ad Neeleman (2005). *Beyond morphology: interface conditions on word formation.* Oxford: Oxford University Press.

Biberauer, Theresa and Ian Roberts (2008). 'Subjects, tense and verb-movement in Germanic and Romance.' In Elliott Lash, Yi-An Lin and Thomas Rainsford (eds.) *Cambridge Occasional Papers in Linguistics* 3: 24–43.

Bobaljik, Jonathon (2002). 'A-chains at the PF interface: Copies and 'covert' movement.' *Natural Language and Linguistic Theory* 20: 197–267.

Brody, Michael (1995). *Lexico-logical form: a radically minimalist theory.* Cambridge, MA: MIT Press.

Cardinaletti, Anna and Ian Roberts (2002). 'The Extended Projection Principle as a condition on the tense dependency.' In Peter Svenonius (ed.) *Subjects, expletives, and the EPP.* Oxford: Oxford University Press, pp. 125–156.

Carnie, Andrew, Heidi Harley and Elizabeth Pyatt (2000). 'VSO order as raising out of IP? Some evidence from Old Irish.' In Andrew Carnie and Eithne Guilfoyle (eds.), *The syntax of verb-initial languages.* New York: Oxford University Press, pp. 39–59.

Chomsky, Noam (1957). *Syntactic structures.* The Hague: Mouton.

Chomsky, Noam (2000). 'Minimalist inquiries: the framework.' In Roger Martin, David Michaels and Juan Uriagereka (eds.) *Step by step: essays in minimalist syntax in honor of Howard Lasnik.* Cambridge, MA: MIT Press, pp. 89–156.

Chomsky, Noam (2001). 'Derivation by phase.' In Michael Kenstowicz (ed.), *Ken Hale: a life in language.* Cambridge, MA: MIT Press, pp 1–52.

Chomsky, Noam (2004). 'Beyond explanatory adequacy.' In Adriana Belletti (ed.) *Structures and beyond: the cartography of syntactic structures, volume 3*. Oxford: Oxford University Press, pp. 104–131.

Chomsky, Noam (2005). "On phases," unpublished manuscript, MIT.

Chomsky, Noam (2006). "Approaching UG from below," unpublished manuscript, MIT.

Chomsky, Noam and Morris Halle (1968). *The sound pattern of English*. New York: Harper and Row.

Chung, Sandra and James McCloskey (1987) 'Government, barriers and small clauses in Modern Irish.' *Linguistic Inquiry* 18: 173–237.

Déchaine, Rose-Marie and Martina Wiltschko (2003). "Negation at the left periphery. Evidence from Algonquian and Salish." In L. Carmichael, C-H. Huang and V. Samiian (eds.), *Proceedings of WECOL 2001*. Fresno CA: CSU Fresno, pp. 104-117.

Embick, David and Rolf Noyer (2001). 'Movement operations after syntax.' *Linguistic Inquiry* 32: 555–596.

Franks, Steven (1999). 'Optimality Theory and clitics at PF.' In K. Dziwirek, H. Coats and C. M. Vakareliyska (eds.) *Proceedings of Formal Approaches to Slavic Linguistics* 7. Ann Arbor: Michigan Slavic Publications, pp. 101–116.

Fuß, Eric. (2005). *The rise of agreement. A formal approach to the syntax and grammaticalization of verbal inflection*. Amsterdam: John Benjamins.

Grohmann, Kleanthes (2000). 'Towards a syntactic understanding of prosodically reduced pronouns.' *Theoretical Linguistics* 26: 175–210.

Halle, Morris and Alec Marantz (1993). 'Distributed morphology and the pieces of inflection.' Ken Hale and Samuel Jay Keyser (eds.) *The view from building 20*. Cambridge, MA: MIT Press, pp. 111–176.

Halle, Morris and Alec Marantz (1994). 'Some key features of Distributed Morphology.' In Andrew Carnie and Heidi Harley (eds.) *Papers on phonology and morphology, MIT Working Papers in Linguistics* 21: 257–288.

Halpern, Aaron (1995). *On the placement and morphology of clitics*. Stanford, CA: CSLI Publications.

Harley, Heidi (1994). 'Deriving the Morphosyntactic Feature Hierarchy.' In Andrew Carnie and Heidi Harley (eds.) *MIT Working Papers in Linguistics 21, Papers on Phonology and Morphology*, 21: 289–320.

Harley, Heidi and Rolf Noyer (1999). 'Distributed Morphology.' *GLOT International* 4: 3–9.

Harley, Heidi and Elizabeth Ritter (2002). 'Person and number in pronouns: A feature-geometric analysis.' *Language* 78: 482–526.

Isaac, Graham. (2001). 'The function and typology of absolute and conjunct flexion in early Celtic: Some hints from Ancient Egyptian.' *Transactions of the Philological Society*, 145–168.

Kayne, Richard (1975). *French syntax: the transformational cycle*. Cambridge, MA: MIT Press.

Kayne, Richard (1991). 'Romance clitics, verb movement and PRO.' *Linguistic Inquiry* 33: 409–442.

Kayne, Richard (1994). *The antisymmetry of syntax*. Cambridge MA: MIT Press.

Koch, John. (1987). 'Prosody and the Old Celtic verbal complex.' *Ériu* 38: 143–176.

Laka, Itziar (1990). *Negation in syntax. On the nature of functional categories and projections*. PhD dissertation, MIT.

Landau, Idan (2006). 'Chain resolution in Hebrew V(P) fronting.' *Syntax* 9: 32–66.

Lasnik, Howard (1981). 'Restricting the theory of transformations: A case study.' In Norbert Hornstein and David Lightfoot (eds.) *Explanations in linguistics*. London: Longman.

Lasnik, Howard (1995) 'Verbal morphology: syntactic structures meets the minimalist program.' In H. Campos and P. Kempchinsky (eds.) *Evolution and revolution in*

linguistic theory: Essays in honor of Carlos Otero. Georgetown University Press, Washington DC, 251–275. [Reprinted in Lasnik, Howard (1999). *Minimalist analysis*. Oxford: Blackwell.]

McCloskey, James (2001). 'The morphosyntax of wh-extraction in Irish.' *Journal of Linguistics* 37: 67–100.

McCloskey, James (2002). 'Resumption, successive cyclicity, and the locality of operations.' In Samuel Epstein and David Seely (eds.) *Derivation and explanation in the minimalist program*. Malden MA, Blackwell, pp. 184–226.

McCone, Kim (1980). 'The nasalizing relative clause with object antecedent in the glosses.' *Ériu* 31: 10–27.

McCone, Kim (1997). *The Early Irish Verb*. Maynooth: An Sagart.

Marantz, Alex (1988). 'Clitics, morphological merger, and the mapping to phonological structure.' In Michael Hammond and Michael Noonan (eds.), *Theoretical Morphology: Approaches in Modern Linguistics*. San Diego: Academic Press, pp. 253-270.

McDaniel, Dana (1989). 'Partial and multiple wh-movement.' *Natural Language and Linguistic Theory* 7: 565–604.

Newton, Glenda (2006). *The development and loss of the Old Irish double system of verbal inflection*. PhD dissertation, University of Cambridge.

Newton, Glenda (2008) 'Accounting for do-support post-syntactically: Evidence from Old Irish'. To appear in Penn Working Papers in Linguistics.

Nunes, Jairo (1999). 'Linearization of chains and phonetic realization of chain links.' In Samuel Epstein and Norbert Hornstein (eds.) *Working minimalism*. Cambridge, MA: MIT Press.

Nunes, Jairo (2004). *Linearization of chains and sideward movement*. Cambridge, MA: MIT Press.

Ó hUiginn, Ruairi (1997). 'Aspects of clause subordination in Celtic.' In F. Josephson (ed.) *Celts and Vikings: proceedings of the Fourth Symposium of Societas Celtologica Nordica*. Gothenberg: Meijerbergs institut för svensk etymologisk forskning, pp. 69–87.

Pesetsky, David. (1997). 'Optimality theory and syntax: movement and pronunciation.' In D. Archangeli and T. Langendoen (eds.) *Optimality theory: an overview*. Malden, MA: Blackwell, pp. 134–170.

Thurneysen, Rudolf (1946). *A Grammar of Old Irish: An Enlarged Edition with Supplement* translated by Daniel A Binchy and Osborn Bergin. Dublin: Dublin Institute for Advanced Studies.

Uriagereka, Juan (1995) 'Aspects of the syntax of clitic placement in Western Romance.' *Linguistic Inquiry* 26 : 79–123.

Zanuttini, Raffaella (1997). *Negation and clausal structure: A comparative study of Romance languages*. New York: Oxford University Press.

Zwicky, Arnold and Geoffrey Pullum (1983). 'Cliticization vs. inflection: English n't.' *Language* 59: 502–513.

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