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ON SOME WELSH UNBOUNDED DEPENDENCY CONSTRUCTIONS¹

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1. Introduction

It has been clear since Ross (1967) and Chomsky (1977) that many languages have a class of what can be called unbounded dependency constructions (UDCs) containing a gap or a resumptive pronoun and some distinctive higher structure. In some cases, the higher structure contains a filler, a constituent in a non-argument position with most of the properties of the gap. *Wh*-interrogatives and relative clauses are probably the most discussed examples. Most research on UDCs has concentrated on what they have in common, especially the island constraints to which they are subject. However, they differ from each other in various ways, which also need to be accommodated. For example, a UDC may or may not have an overt filler. In the case of Welsh, *wh*-interrogatives exemplify the first possibility, while relative clauses exemplify the second.²

- (1) Pwy (a) welodd Megan?
who PRT saw Megan
'Who saw Megan?/Who did Megan see?'
- (2) y dyn (*pwy) (a) welodd Megan
the man who PRT saw Megan
'the man who saw Megan/who Megan saw'

Similarly, the construction may allow the highest verb to be finite or non-finite or may require it to be finite. In Welsh, *wh*-interrogatives and cleft sentences illustrate this contrast.

- (3) a. Gofynnodd Gwyn [pa lyfr (a) ddarllenodd Megan]
asked Gwyn which book PRT read Megan
'Gwyn asked which book Megan read.'
- b. Gofynnodd Gwyn [pa lyfr i' w ddarllen]
asked Gwyn which book to 3SGM read
'Gwyn asked which book to read.'
- (4) a. Dywedodd Gwyn mai [llyfr (a) ddarllenodd Megan]
said Gwyn that book PRT read Megan
'Gwyn said that it was a book that Megan read.'

¹ An earlier version of this paper was presented at the Fifth Celtic Linguistics Conference in Gregynog from September 7th-9th, 2007. I am grateful to Bob Morris Jones for help with the data and to Ivan Sag for helpful comments. Any bad bits are my responsibility.

² Adjunct relative clauses allow the *wh*-words *lle* 'where', *pryd* 'when' and *pam* 'why' as fillers. The following from Borsley, Tallerman and Willis (2007: chapter 4) illustrates the first of these:

- (i) yr ardal lle gafodd ei fagu
the district where get.PAST.3SG 3SGM raise
'the district where he was brought up'

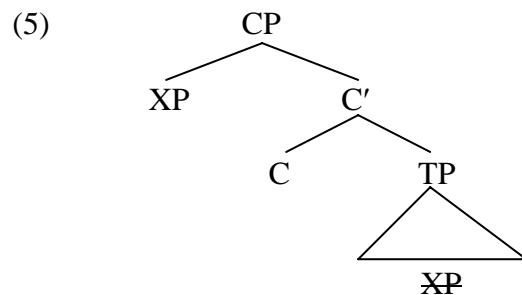
- b. *Dywedodd Gwyn mai [llyfr i' w ddarllen]
said Gwyn that book to 3SGM read

An adequate approach to syntax needs to be able to capture the differences as well as the similarities in this area. It seems that the differences have received little attention within Principles and Parameters theory (P&P) and Minimalism. As Culicover and Jackendoff (2005: 535) put it, 'much of the fine detail of traditional constructions has ceased to garner attention'. In contrast, construction-based Head-driven Phrase Structure Grammar (HPSG), as developed in Sag (1997, 2007) and Ginzburg and Sag (2000), has been very much concerned to accommodate both the distinctive properties of various UDCs and their shared properties. In this paper I will focus on the differences among three Welsh UDCs. I will argue that the facts are problematic for P&P/Minimalism, but that they pose no problems for construction-based HPSG.

The paper is organized as follows. In section 2, I outline the approaches to UDCs assumed in P&P/Minimalism and HPSG. In section 3, I set out the basic facts of the three Welsh UDCs. In section 4, I consider the analytic issues, focusing especially on P&P/Minimalism. Then, in section 5, I develop an HPSG analysis of the constructions. Finally, in section 6, I summarize the paper.

2. Approaches to unbounded dependencies

For P&P/Minimalism, UDC's involve A'-movement, movement to Spec CP. In cases where there is no visible filler, an invisible filler is assumed. For Minimalism moves leaves a copy, which is deleted in PF. Thus, UDCs involve the following structure:

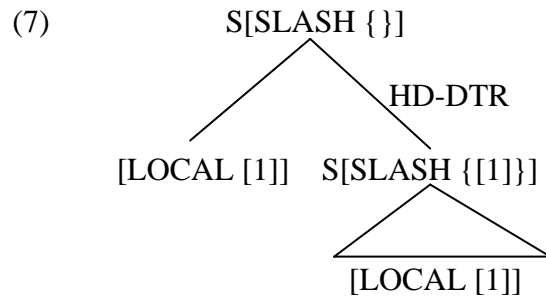


An important feature of this analysis, which will be relevant later, is that it predicts that a filler has all the properties of the associated gap.

For HPSG, UDC's involve the SLASH feature, which makes information about a gap available higher in the structure. In some HPSG work, gaps are analyzed as empty categories. In other work, they are a member of the ARG-ST (ARGUMENT-STRUCTURE) list of some head with no counterpart in constituent structure. Which is the right approach is unimportant in the present context. Gaps have the following feature makeup:



The LOCAL feature encodes most but not all of the syntactic and semantic properties of an expression. As (6) makes clear, the SLASH feature is not part of the value of LOCAL. Nor is the WH feature used in the analysis of *wh*-interrogatives. In (6) the value of LOCAL is also the single member of the set which is the value of the SLASH. Constraints ensure that all categories between the gap and the top of dependency have the same value for SLASH, and where a UDC contains a visible filler, its LOCAL value derives from the SLASH feature. In HPSG, all aspects of linguistic expressions including their internal structure are analyzed in terms of features. However, it is convenient to use the traditional tree notation. A UDC with a visible filler can be represented as follows:



Notice that the topmost node has the empty set as the value of SLASH, reflecting the fact that its daughters are the top of the dependency. Notice also that the second daughter is identified as the head daughter. Within this analysis, a filler has most but not all of the syntactic and semantic properties of the associated gap. This will be relevant later.

No invisible fillers are assumed in HPSG. Hence, the top of the dependency has a somewhat different character in a Welsh relative clause or in the complement of a Welsh ‘tough’ adjective such as *hawdd* in (8)

- (8) Mae Carys yn hawdd [i Ifor ei gweld]
 is Carys PRED easy to Ifor 3SGF see
 ‘Carys is easy for Ifor to see.’

How do the two approaches account for the distinctive properties of individual UDCs? Within P&P/Minimalism they must be attributed to the normally invisible C element that heads them. In some cases it is not hard to see how this can be done. In *wh*-interrogatives the filler must be an interrogative *wh*-phrase. If the relevant C element has the right features it will only allow such a phrase as its specifier. We will see, however, that there are cases where it is not so easy to handle the distinctive properties of a UDC.

Construction-based HPSG has a phrase type corresponding to each UDC and their distinctive properties can be captured by constraints on the relevant phrase type. One might wonder about shared properties. However, the central feature of construction-based HPSG is that phrase types are organized into certain hierarchies. This means that shared properties can be captured by constraints on more general phrase types. We will see what this means in practice in section 5.

3. Some Welsh UDCs

In this section I will outline the main properties of Welsh *wh*-interrogatives, free relatives and clefts. These are all UDCs and hence they share certain properties. However, they also differ in important and challenging ways.

We can deal with *wh*-interrogatives fairly briefly. Like all UDCs they contain either a gap, as in (9), or a resumptive pronoun, as in (10).

- (9) Pa ddynion welodd ddraig?
 which men saw.3SG dragon
 ‘Which men saw a dragon?’
- (10) Pa ddynion cytunodd Gwyn â nhw?
 which men agreed.3SG Gwyn with them
 ‘Which men did Gwyn agree with?’

Roughly gaps appear in more accessible positions and resumptive pronouns in less accessible positions.³ A distinctive feature of *wh*-interrogatives noted early is that they may be non-finite as well as finite. (3b), repeated here as (11), illustrates:

- (11) Gofynnodd Gwyn [pa lyfr i’ w ddarllen]
 asked Gwyn which book to 3SGM read
 ‘Gwyn asked which book to read.’

Like their English counterparts Welsh *wh*-interrogatives allow a variety of *wh*-phrases. As we would expect, however, the nature of the *wh*-phrase has no influence on the distribution of *wh*-interrogatives. A *wh*-interrogative with an adverbial *wh*-phrase has the same distribution as a *wh*-interrogative with a nominal *wh*-phrase. The following illustrate:

- (12) Gofynnodd Gwyn [beth naeth Megan]
 ask.PAST.3SG Gwyn what do.PAST.3SG Megan
 ‘Gwyn asked what Megan did.’
- (13) Gofynnodd Gwyn [lle aeth Megan]
 ask.PAST.3SG Gwyn where go.PAST.3SG Megan
 ‘Gwyn asked where Megan went.’

We turn to free relatives. These are rather like their English counterparts. They involve a *wh*-word and optionally the element *bynnag* ‘ever’, as the following show:

- (14) beth (bynnag) naeth Megan
 what ever do. PAST.3SG Megan
 ‘what(ever) Megan did’
- (15) lle (bynnag) aeth Megan
 where ever go. PAST.3SG Megan
 ‘where(ever) Megan went’

Like *wh*-interrogatives they contain either a gap, as in (14) or (15), or a resumptive pronoun, as in (16).

³ See Borsley, Tallerman and Willis (2007: chapter 4) for discussion.

- (16) pwy (bynnag) cytunodd Gwyn â nhw
 who ever agreed.3SG Gwyn with them
 ‘who(ever) Gwyn agreed with’

The distinguishing property of free relatives is that their distribution depends on the nature of the initial constituent. A free relative with a nominal initial constituent can only appear in positions where nominal constituents appear, and a free relative with an adverbial initial constituent can only appear in positions where adverbial constituents appear.

- (17) a. Naeth Gwyn [beth (bynnag) naeth Megan]
 do.PAST.3SG Gwyn what ever do. PAST.3SG Megan
 ‘Gwyn did what(ever) Megan did.’
 b. *Naeth Gwyn [lle (bynnag) aeth Megan]
 do. PAST.3SG Gwyn where ever go. PAST.3SG Megan
- (18) a. Aeth Gwyn [lle (bynnag) aeth Megan]
 go. PAST.3SG Gwyn where ever go. PAST.3SG Megan
 ‘Gwyn went where(ever) Megan went.’
 b. *Aeth Gwyn [beth (bynnag) naeth Megan]
 go. PAST.3SG Gwyn what ever do. PAST.3SG Megan

This, of course, is quite different from the situation with *wh*-interrogatives. It makes the initial constituent of a free relative look like a head. The initial constituent also has the main properties of the gap like a filler. Thus, it behaves like both a filler and a head.

We can now consider clefts. Again, they contain either a gap, as in (19), or a resumptive pronoun, as in (20).

- (19) Y dynion welodd ddraig.
 the men see.PAST.3SG dragon
 ‘It’s the men that saw a dragon.’
- (20) Y dynion cytunodd Gwyn â nhw.
 the men agreed.3SG Gwyn with them
 ‘It’s the men that Gwyn agreed with.’

An distinctive feature of the construction is that the initial constituent may differ from the gap in certain ways. This makes it unlike a typical filler constituent. As we saw in section 2 a filler is expected to have all the properties of the associated gap within P&P/Minimalism, while within HPSG it is expected to have almost all the properties.

A notable feature of Welsh is that a verb agrees with a pronoun but not with a non-pronominal NP. The following illustrate agreement with a following pronominal subject:

- (21) a. Gwelodd o.
 see.PAST.3SG he
 ‘He saw.’
 b. Gwelon nhw.
 see.PAST.3PL he
 ‘They saw.’

With a following non-pronominal subject, the third person form, which is a default form, appears.

- (22) a. Gwelodd y bachgen.
 see.PAST.3SG the boy
 'The boy saw.'
 b. Gwelodd y bechgyn.
 see.PAST.3SG the boys
 'The boys saw.'
 c. *Gwelon y bechgyn.
 see.PAST.3P the boys
 'The boys saw.'

In a cleft sentence with an initial constituent associated with a subject gap the finite verb does not agree, whether the gap is pronominal as in (23) or non-pronominal as in (24):

- (23) a. Nhw welodd ddraig.
 they see.PAST.3SG dragon
 'It was they that saw a dragon.'
 b. *Nhw welon ddraig.
 they see.PAST.3PL dragon
 (24) a. Y bechgyn welodd ddraig.
 the boys see.PAST.3SG dragon
 'It was the boys that saw a dragon.'
 b. *Y bechgyn welon ddraig.
 the boys see.PAST.3PL dragon

This suggests that the gap is non-pronominal whatever the nature of the associated initial constituent.

Welsh has a distinction between strong and weak pronouns which suggests a possible response to this data. These pronouns are orthographically distinct in the first person singular, where the strong form is *fi* and the weak form *i*. The following illustrate the use of these forms:

- (25) a. Fi welodd ddraig.
 I see.PAST.3SG dragon
 'It was I that saw a dragon.'
 b. *Weles fi ddraig.
 see.PAST.1SG I dragon
 (26) a. Weles i ddraig.
 see.PAST.1SG I dragon
 'I saw a dragon.'
 b. *I welodd ddraig.
 I see.PAST.3SG dragon

On the basis of this data one might suggest that only strong pronouns, which do not trigger agreement, can be fronted while weak pronouns, which trigger agreement, must remain in-situ. One might also suggest that strong pronouns do not trigger

agreement because they are not true pronouns. On this view, what looks like a pronoun in initial position is not really a pronoun and hence the initial constituent in (23a) and (25a) is non-pronominal just like the gap.

It looks, then, as if there may in fact be no contrast between the initial constituent and the gap. However, strong pronouns are not ordinary non-pronominal NPs. Unlike such NPs they cannot appear in subject position, whether or not there actually is any agreement.⁴ Thus, (27) is no more acceptable than (25b).

- (27) *Welodd fi ddraig.
 see.PAST.3SG I dragon
 'I saw a dragon.'

It seems, then, that strong pronouns must have some distinguishing feature and that this feature is excluded from subject position and other positions which can be associated with agreement. It follows that the initial constituents in (23a) and (25a) will have the feature but the gaps, being in subject position, will not. Thus, we do have a contrast between the initial constituent and the gap after all.

A second type of contrast between initial constituent and gap is highlighted by the following examples:

- (28) a. Fi mae Gwyn wedi 'i ddewis/*fy newis.
 I be.PRES.3SG Gwyn PERF 3SGM choose 1SG choose
 'It's me that Gwyn has chosen.'
 b. Ti mae Gwyn wedi 'i ddewis/*dy ddewis.
 you.SG be.PRES.3SG Gwyn PERF 3SGM choose 2SG choose
 'It's you that Gwyn has chosen.'

In these examples the gap is object of a non-finite verb. In this situation, the non-finite verb is preceded by a clitic agreeing with the gap. In these examples the clitic is third person singular masculine, and so is the gap, but the initial constituent is a first person singular in (28a) and second person singular in (28b). The clitic cannot be first person in (28a) or second person in (28b). Thus, initial constituent and gap differ in person.

We have a similar situation with resumptive pronouns. Consider the following examples:

- (29) Fi soniodd Gwyn amdano (fo)/*amdanaf (fi).
 I talk.PAST.3SG Gwyn about.3SGM he about.1SG I
 'It was me that Gwyn talked about?'
 (30) Fi wyt ti 'n siarad efo fo/*fi.
 I be.PRES.2SG you.SG PROG speak with he I
 'It is me that you are talking to.'

In (29) a resumptive pronoun appears as object of an inflected preposition, where it is optional as the bracketing indicates. In (30) a resumptive pronoun appears as object of a preposition which doesn't inflect, and it is obligatory. In both examples, the resumptive pronoun is third person and cannot be first person although the initial constituent is first person. It seems, then, that clefts have a third person gap or resumptive pronoun, whatever the person of the initial constituent.

⁴ In fact strong pronouns cannot appear in any positions which can be associated with agreement.

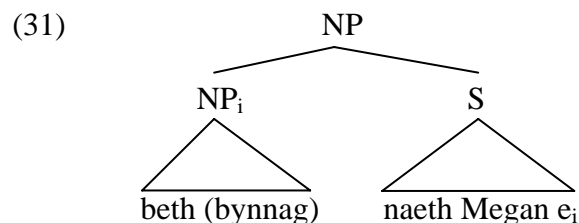
Thus, the initial constituent in a cleft sentence and the associated gap or resumptive pronoun differ in two important respects. This is not what one expects of a filler. Hence, this constituent does not behave like a typical filler.

4. Possible analyses

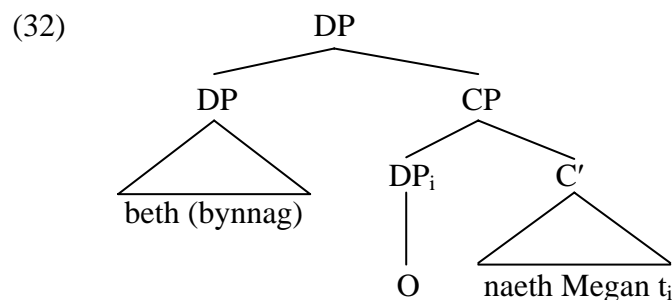
No special issues arise about *wh*-interrogatives, but both free relatives and clefts raise important questions. In this section I will consider some of the analytic possibilities within a transformational approach.

As noted in the last section Welsh free relatives are not very different from their English counterparts. In work on English free relatives it has commonly been assumed either that the initial constituent is a head and not a filler or a filler and not a head. Both positions have their drawbacks.

The position that the initial constituent is a head and not a filler was developed by Bresnan and Grimshaw (1978). They proposed that the initial constituent is a head related to the gap not by movement but by what they called controlled-PRO-deletion. Applied to (14), this approach would give the following structure:



A problem for this approach is that the dependency between the initial constituent and the gap is subject to the same constraints as the dependency in *wh*-interrogatives. This suggests that the two dependencies should be the result of the same mechanism. One way to maintain this assumption would be to propose that they involve the movement of an empty operator. Assuming DP rather than NP, this would give the following structure for (14):

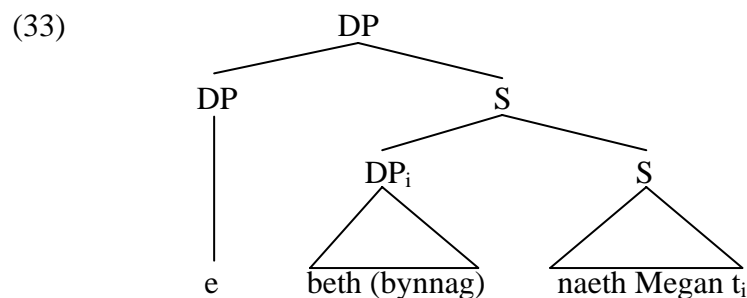


This looks rather like a complex DP containing a relative clause. Here, however, the empty operator may be of various categories, unlike in a relative clause. Crucially the empty operator and the head must have the same category. It is not clear how this requirement should be imposed.

An alternative to the analysis is what Bresnan and Grimshaw (1978) call the ‘comp analysis’.⁵ This is an analysis in which the initial constituent is a filler

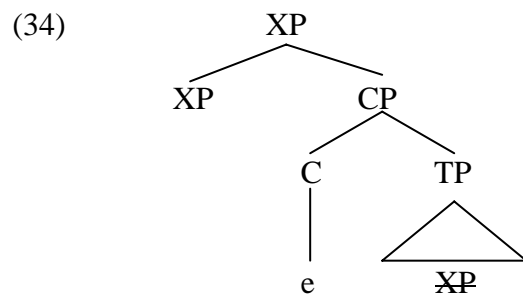
⁵ The term ‘comp analysis’ reflects the assumption standard in the 1970s that fronted *wh*-phrases are in Comp and not in Spec CP.

preceded by an invisible head with the same properties. See, for example, Groos and van Riemsdijk (1981) and Grosu (2003). On this analysis, (14) would have the following structure:



A problem for this analysis is that it is unusual to have an empty element deriving its properties from an overt element which it asymmetrically c-commands. As in the revised version of the head analysis, it is also not really clear how the identity requirement can be imposed.

In a sense, the head and comp analyses are rather similar. Both claim that the initial constituent appears to behave like both a head and filler because there are two elements with the same syntactic properties, one visible and one invisible, and one is a head and the other a filler. They differ in which element they take to be visible and which invisible. The obvious alternative is an analysis in which the initial constituent is both a head and filler, as it appears to be. Citko (2006) calls this the Project Goal approach, and she traces it back to Larson (1998).⁶ On this approach, (14) would have the structure in (34):



This approach can explain both the facts that suggest that the initial constituent is a filler and the facts that suggest it is a head. As Citko (2006: 24) puts it, '[t]he *Project Goal* account can explain both locality and matching effects, thus combining the insights of both the Head and the Comp Account'.

Certain English examples are problematic for a simple version of this approach. Consider, for example, the following from Wright and Kathol (2002: 374), where both the free relative and its initial constituent are bracketed:

(35) [[Whoever's dogs] are running around in the garden] is in big trouble.

Here the initial constituent is plural, as shown by the verb *are*, but the free relative is singular, as shown by the following verb *is*. *Whoever's dogs are running around in*

⁶ Essentially the same position is developed in Huddleston and Pullum (2002: 1073) and Payne *et al.* (2007: 1.1). A related position is developed in Bury (2006: chapter 4).

the garden is understood as *the person whose dogs are running around in the garden* and is singular like the latter. Rather similar is the following from Grosu (2003: 254):

(36) I will fire [[whoever's signature] appears on this list].

Here *whoever's signature appears on this list* is understood as *the person whose signature appears on this list*. Examples like these are problematic for the idea that the initial constituent is a head if head and mother have exactly the same properties as assumed in Minimalism (Chomsky 1995: 244). However, there appear to be no Welsh examples of this kind. As (37) shows, a Welsh sentence resembling (35) means that the dogs are in big trouble not the owner.

(37) Mae cwn pwy bynnag sy 'n rhedeg o gwmpas yn yr ardd
 be.PRES.3SG dog who ever be.PRES.3SG PRED run around in the garden
 mewn trwbl.
 in trouble
 'Whoever's dogs are running around in the garden are in big trouble.'

Similarly, as (38) shows, a Welsh sentence resembling (36) refers to sacking the name and not the person.

(38) *Mi na' i roi 'r sac i enw pwy bynnag sydd ar y rhestr.
 PRT do.FUT,1SG I give the sack to name who ever be.PRES.3SG on the list
 'I will fire the name of whoever is on the list.'

Moreover, examples like (35) and (36) are no problem for the idea that the initial constituent is a head within HPSG because HPSG assumes that head and mother have the same syntactic and semantic properties by default, i.e. unless some other constraint requires something different.

It seems, then, that the idea that the initial constituent of a free relative is a head is unproblematic in Welsh, and it is unproblematic in English as well, given HPSG assumptions about heads. Hence, it seems reasonable to assume that it is a head as well as a filler in both languages. However, it is not clear to me how this assumption could be implemented within Minimalism. It is not clear, that is, how one could ensure that a constituent in Spec CP is a head here but not elsewhere. We will see, however, in section 5 that it is easy to implement this idea within HPSG.

We can turn now to clefts. Here, the facts suggest that the initial constituent is not a filler. In fact they suggest that it is not even coindexed with the gap/resumptive pronoun since coindexed elements normally have the same person features. Interestingly the kind of person mismatch that we have in Welsh clefts is also found in English clefts. Consider for example, the following from Akmajian (1970:150):⁷

(39) It's me who *is* responsible.

⁷ For similar naturally occurring examples see the following from the song 'Walking down the road with you' on the Oysterband's CD *Meet You There* (Westpark music):

(i) It's me that cracks the whip and it's me that keeps the keys.

Pollard and Sag (1994: 6.5) suggest that the focused constituent in English clefts is a filler sharing most of its syntactic and semantic properties with the gap for some speakers and a non-filler coindexed with the gap for others. Neither analysis can accommodate examples like (39). Such examples are no problem if we assume that they involve an identity predication since there is no requirement of person identity in identity predications, as the following show:

- (40) a. I am the teacher.
 b. You are the teacher.

I want to suggest that Welsh clefts are rather like their English counterparts. That is they involve an identity predication. They differ in that there is no visible lexical item realizing this predication. Examples like the following show that there is no requirement of person identity in Welsh identity predications:

- (41) Yr athro ydw i.
 the teacher be.PRES.1SG I
 'I am the teacher.'
 (42) Yr athro wyt ti
 the teacher be.PRES.2SG you.SG
 'You are the teacher.'

Rather more like English clefts are examples like the following, which we might call quasi pseudo-clefts:

- (43) Fi ydy 'r un mae Gwyn wedi 'i ddewis.
 I be.PRES.3SG the one be.PRES.3SG Gwyn PERF 3SGM choose
 'The one that Gwyn has chosen is me.'
 (44) Fi ydy 'r un soniodd Gwyn amdano (fo).
 I be.PRES.3SG the one talk.PAST.3SG Gwyn about.3SGM he
 'The one that Gwyn talked to is me.'
 (45) Fi ydy 'r un wyt ti 'n siarad efo fo.
 I be.PRES.3SG the one be.PRES.2SG you.SG PROG talk with he
 'The one that you are talking to is me.'

Here, as in English clefts, the identity predication is overt. Again there is no person identity.

I am proposing, then, that Welsh clefts involve a hidden identity predication. Negation provides some support for this proposal. Consider, for example, the following:

- (46) Nid/dim nhw welodd ddraig.
 NEG they see.PAST.3SG dragon
 'It wasn't they that saw a dragon.'

Here, it seems that it is the hidden identity predication that is negated.⁸ This type of negation is not possible in a *wh*-interrogative. Thus, the following cannot be a *wh*-interrogative, but can only be an echo question based on a cleft

- (47) Nid/dim pwy welodd ddraig?
 NEG who see.PAST.3SG dragon
 'It was who that saw a dragon?'

Thus, the idea that Welsh clefts involve a hidden identity predication seems quite well motivated.

How could this idea be implemented? Within P&P/Minimalism, it would be natural to propose that Welsh contain an empty form of the copula *bod*. One might propose that have an empty counterpart of the the form of *bod* that appears in the examples in (41) and (42). This would mean that (23a) has the structure in (48).

- (48) [[nhw] [_{cop} e] [welodd ddraig]]

Notice that the verb agrees with the following pronoun in the examples in (41) and (42), suggesting that this element is the subject of the sentence. Hence, if (48) contains an empty counterpart of the form of *bod* that appears in these examples, *welodd ddraig* must be a subject. Welsh, however, does not allow finite clauses in subject position.⁹ Thus, while (49a) is fine (49b) is ungrammatical:

- (49) a. Synnodd bawb [y byddai angen mwy o arian].
 surprise.PAST.3S everyone PRT be.COND.3SG need more of money
 'It surprised everyone that more money was needed.'
 b. *Synnodd [y byddai angen mwy o arian] bawb.
 surprise.PAST.3S PRT be.COND.3SG need more of money everyone

Hence, the analysis in (48) is quite problematic.

A further point to note about the analysis in (48) is that it involves a construction-specific invisible element. Assuming such an element is very similar to assuming constructions, something P&P/Minimalism has always rejected. It is not clear why such an element would be preferred to a construction. In the next section we will outline an HPSG analysis in which clefts are the realization of a specific construction.

⁸ The clausal part of the cleft sentence can also be negated, as in (i).

- (i) Nhw welodd ddim draig,
 they see.PAST.3SG NEG dragon
 'It was they that didn't see a dragon'.

It is also possible to have both parts of the sentence negated, as in (ii).

- (ii) Nid/dim nhw welodd ddim draig.
 NEG they see.PAST.3SG NEG dragon
 'It was not they that didn't see a dragon.'

⁹ See Borsley, Tallerman and Willis (2007: 2.6.2) for some discussion.

5. An HSPG analysis

In this section I will show construction-based HPSG with its hierarchies of phrase types can provide an analysis of the three Welsh constructions which captures both their distinctive properties and the properties that they share. I begin by summarizing the facts that need to be accommodated. Then I introduce some elements of HPSG. Then I outline the analysis.

As I have emphasized, the three constructions show similarities and differences. The facts are summarized in the following tables:

	Filler	Head
<i>Wh</i> -interrogatives	Yes	No
Free relatives	Yes	Yes
Clefts	No	No

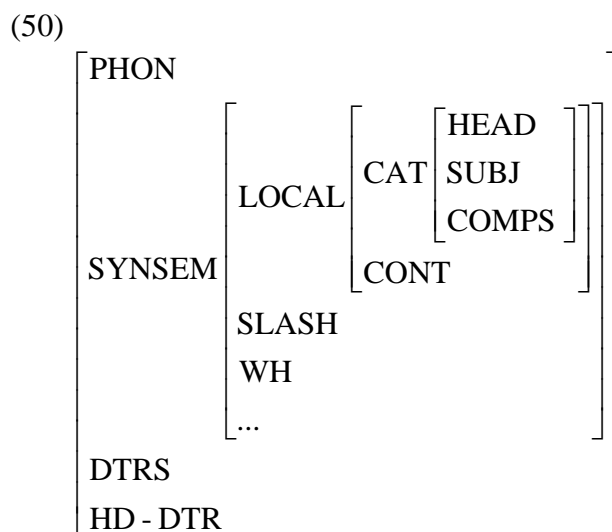
Table 1: First daughter

	Contains gap/RP	Head
<i>Wh</i> -interrogatives	Yes	Yes
Free relatives	Yes	No
Clefts	Yes	Yes

Table 2: Second daughter

Table 2 shows that all three constructions have a gap or resumptive pronoun within the second daughter. Table 1 shows that *Wh*-interrogatives and free relatives are similar in having a filler daughter. Finally, Table 2 shows that *wh*-interrogatives and clefts are similar in having a second daughter which is a head. A satisfactory analysis needs to capture these similarities.

As noted in section 2, all aspects of linguistic expressions including their internal structure are analyzed in terms of features in HPSG. A phrasal sign has the following feature makeup:¹⁰



¹⁰ A lexical sign does not have the features DTRS and HD-DTR.

Thus, a phrasal sign has phonological properties, syntactic and semantic properties, one or more daughters, and possibly a head daughter. The features LOCAL, SLASH and WH were introduced in section 2. Within the value of LOCAL the feature CAT(EGORY) encodes the main syntactic properties of the sign while CONT(ENT) encodes the main semantic properties. Within the value of CAT, HEAD encodes the basic categorial status of the sign, whether it is nominal, verbal, etc., SUBJ indicates what kind of subject the sign requires, and COMPS indicates what complements the sign takes. For a phrasal sign the value of COMPS is always the empty list ($\langle \rangle$) because phrases never require complements. In subsequent discussion, I will use NP and S[*fin*] as abbreviations as follows:¹¹

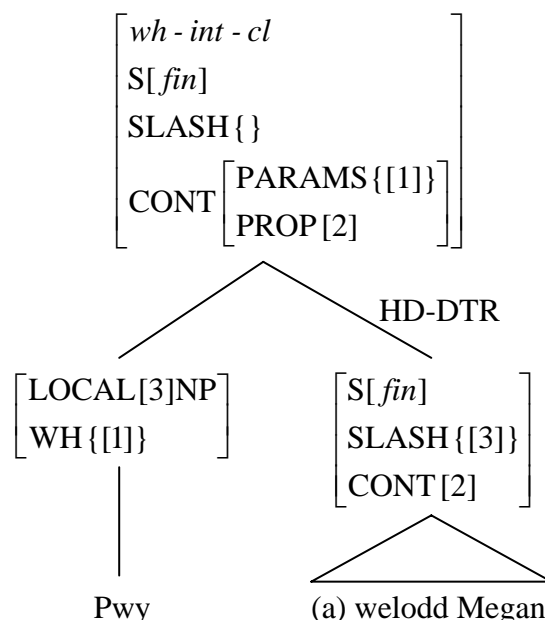
(51)

$$\text{NP} = \begin{bmatrix} \textit{phrase} \\ \text{HEAD } \textit{noun} \\ \text{SUBJ } \langle \rangle \\ \text{COMPS } \langle \rangle \end{bmatrix} \quad \text{S}[\textit{fin}] = \begin{bmatrix} \textit{phrase} \\ \text{HEAD} \begin{bmatrix} \textit{v} \\ \text{VFORM } \textit{fin} \end{bmatrix} \\ \text{SUBJ } \langle \rangle \\ \text{COMPS } \langle \rangle \end{bmatrix}$$

Having introduced some of the elements of HPSG I will now propose structures for the three Welsh UDCs. Then I will provide types and constraints which license just the right structures, capturing both the similarities and differences.

Using the abbreviations just introduced, we can propose the following structure for the *wh*-interrogative in (1) (using the traditional tree notation). (Here and subsequently I ignore the types of the daughters.)

(52)



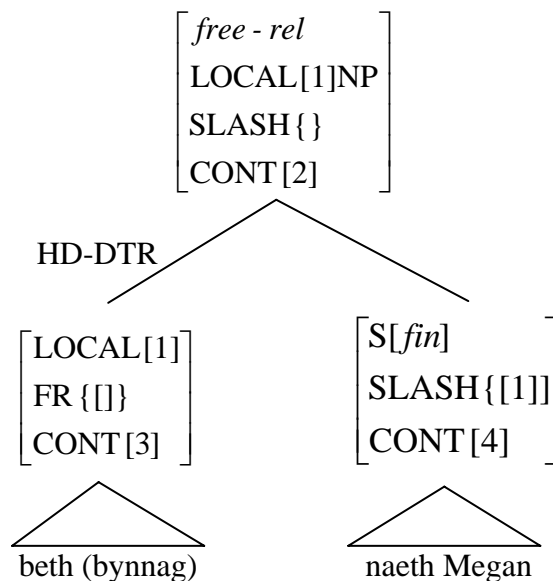
¹¹ The abbreviation here is appropriate for argument NPs. Predicative NPs such as *athro da* in the following will have a non-empty value for SUBJ

- (i) Mae o'n athro da.
 be.PRES.3SG he PRED teacher good
 'He is a good teacher.'

Here, the first daughter is a filler and its LOCAL value is the local feature structure in the value of SLASH in the second daughter, and the second daughter is the head. The mother is SLASH {}, as mentioned in section 2. The representation incorporates the semantic analysis of *wh*-interrogatives proposed in Ginzburg and Sag (2000: chapter 4).

Turning now to free relatives we can propose the following structure for the example in (14):

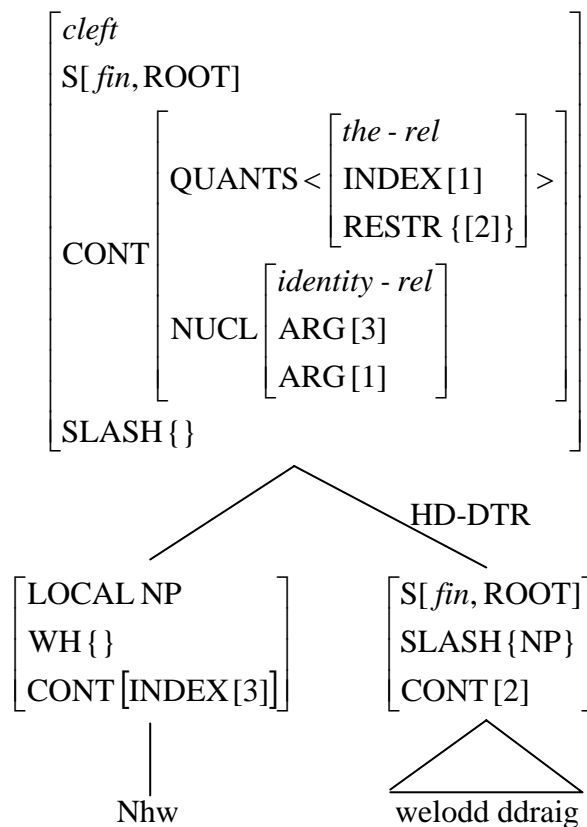
(53)



Here, as in (52), the first daughter is a filler, whose LOCAL value is the local feature structure in the value of SLASH in the second daughter. However, in this case, the first daughter is the head and as a result the mother has the same value for the feature LOCAL. As before the value of SLASH in the mother is {}. I assume that FR is a feature which has a non-empty value in free relative *wh*-elements. I will not try to decide on its precise nature. The precise relation between [2] and [3] and [4], the CONTENT values of the mother and the two daughters, will depend on the nature of the first daughter, especially whether it contains *bynnag*. I will not go into this.

Finally we can consider clefts. Here we can propose the following structure for the example in (23a):

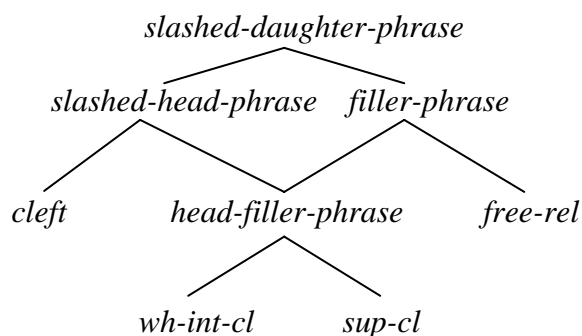
(54)



Here, the first daughter is not a filler and its LOCAL value is not identified with the local feature structure in the value of SLASH in the second daughter. However, the second daughter is the head as in (52). Once more the value of SLASH in the mother is {}. The CONTENT value of the mother makes it clear that the second daughter is interpreted as a definite description and identified with the first daughter. Thus, clefts are interpreted as identity predications even though there is no lexical element in their structure which has an identity interpretation.

An HPSG analysis involves types and constraints.¹² As noted in section 2, the former are hierarchically organized and classify linguistic objects. The latter are implicational statements imposing restrictions on linguistic objects. In the case of phrases they may impose restrictions on their internal structure, categorial makeup or content. We can accommodate the Welsh constructions with the following system of types:

(55)



¹² I am assuming the version of HPSG adopted in Ginzburg and Sag (2000). A slightly different version of HPSG is presented in Sag (2007).

There are four maximal types here, one for each of the constructions that we are focusing on here and one for what I will call superlative clauses, which occur in the following correlative construction:¹³

- (56) (Y) mwya dw i 'n ddarllen, (y) mwya dw i'n
 the most be.PRES.1SG I PROG read the most be.PRES.1SG I PROG
 ddeall.
 understand
 'The more I read, the more I understand.'

These clauses have much in common with *wh*-interrogatives and hence they are grouped together as subtypes of *head-filler-phrase*. All four constructions are instances of the type *slashed-daughter-phrase*. Their shared properties can be expressed as constraints on this type. Clefts and head-filler-phrases are subtypes of the type *slashed-head-phrase*, while head-filler-phrases and free relatives are subtypes of the type *filler-phrase*. Hence, we can capture both the similarities between clefts and *wh*-interrogatives and the similarities between *wh*-interrogatives and free relatives.

The most basic constraint that we need is the following constraint on slashed-daughter-phrases:

- (57)
- $$sl-dtr-ph \rightarrow \left[\begin{array}{l} SLASH \{ \} \\ DTRS < [phrase], \left[\begin{array}{l} clause \\ SLASH \{ \{ \} \} \end{array} \right] > \end{array} \right]$$

This says that a slashed-daughter-phrase is SLASH { } and has one daughter which is a phrase and another which is a clause with a single local feature structure within the value of SLASH. I am assuming here that both gaps and resumptive pronouns involve the SLASH feature. An example like the following provides some evidence for this.

- (58) y dyn [welais i a oeddwn i'n nabod ei dad o]
 the man see.PAST.1SG I and be.IMPF.1SG I PROG know 3SGM father he
 'the man who I saw and whose father I knew'

Here, there is a gap in the first conjunct and a resumptive pronoun in the second suggesting that they have a similar status. All three of the constructions conform to the constraint in (57). Next we need the following constraint on slashed-head-phrases:

- (59)
- $$sl-hd-ph \rightarrow \left[\begin{array}{l} DTRS < [], [1] [] > \\ HD - DTR [1] \end{array} \right]$$

This simply says that a slashed-head-phrase has a second daughter which is a head. Both clefts and *wh*-interrogatives conform to this constraint. Finally, for filler phrases, we can propose the constraint in (60).

¹³ The translation here exemplifies the English comparative-correlative construction discussed in Borsley (2004)

$$(60) \textit{fill-ph} \rightarrow [\text{DTRS} < [\text{LOCAL}[1]], [\text{SLASH}\{\{1\}\}] >]$$

This says that a filler-phrase has a first daughter whose LOCAL value is identical to the local feature structure within the value of SLASH on the second daughter. *Wh*-interrogatives and free relatives are subject to this constraint. Head-filler-phrases are subject to all these constraints and thus have the following form.

$$(61) \left[\begin{array}{l} \text{SLASH}\{\} \\ \text{DTRS} < \left[\begin{array}{l} \textit{phrase} \\ \text{LOCAL}[1] \end{array} \right], [2] \left[\begin{array}{l} \textit{clause} \\ \text{SLASH}\{\{1\}\} \end{array} \right] > \\ \text{HD - DTR} [2] \end{array} \right]$$

There seems to be no need for any special constraint on head-filler-phrases.

Each of the three constructions that we are focusing on here requires a constraint to account for its idiosyncratic properties. For *wh*-interrogatives we can propose the following constraint:

$$(62) \textit{wh-int-cl} \rightarrow \left[\begin{array}{l} \text{DTRS} < [\text{WH}\{\{1\}\}], [\text{CONT}[2]] > \\ \text{CONT} \left[\begin{array}{l} \text{PARAMS}\{\{1\}\} \cup \textit{set} \\ \text{PROP}[2] \end{array} \right] \end{array} \right]$$

This says that a *wh*-interrogative has two daughters, where the first has an index in the value of its WH feature which appears in the PARAMS set of the clause and the value of PROP in the second is the value of CONT in the clause. As noted earlier, this assumes Ginzburg and Sag's approach to the semantics of *wh*-interrogatives. There is no need to specify here that the first daughter is a filler and the second a head with a non-empty SLASH value since these things are a consequence of constraints on slashed-daughter-phrases, slashed-head-phrases and filler-phrases. For free relatives, we need the following constraint:

$$(63) \textit{free-rel} \rightarrow \left[\begin{array}{l} \text{CONT}[1] \\ \text{DTRS} < [2] \left[\begin{array}{l} \text{FREL}\{\{\}\} \\ \text{CONT}[3] \end{array} \right], \left[\begin{array}{l} \text{VFORM} \textit{fin} \\ \text{CONT}[4] \end{array} \right] > \\ \text{HD - DTR} [2] \end{array} \right]$$

This says that a free relative has a first daughter which is a free relative *wh*-phrase and a head, and a second daughter which is a finite clause. I leave the precise relation between [1] and [3] and [4] unspecified. There is no need here to specify that the first daughter is a filler and that the second has a non-empty SLASH value since these

things are a consequence of constraints on slashed-daughter-phrases and filler-phrases.¹⁴ For clefts following constraint is necessary:

(64)

$$\text{cleft} \rightarrow \left[\begin{array}{l} \text{DTRS} < \left[\begin{array}{l} \text{WH} \{ \} \\ \text{FR} \{ \} \\ \text{CONT} [\text{INDEX}[1]] \end{array} \right], \left[\begin{array}{l} \text{VFORM } \textit{fin} \\ \text{CONT} [2] \end{array} \right] > \\ \text{QUANTS} < \left[\begin{array}{l} \textit{the - rel} \\ \text{INDEX} [3] \\ \text{RESTR} \{ [2] \} \end{array} \right] > \\ \text{CONT} \\ \text{NUCL} \left[\begin{array}{l} \textit{identity - rel} \\ \text{ARG} [1] \\ \text{ARG} [3] \end{array} \right] \end{array} \right]$$

This says that a cleft has a first daughter which is not an interrogative or free relative *wh*-phrase and a second daughter which is a finite clause and the two daughters are interpreted as the two terms of an identity predication. Constraints on slash-daughter-phrases and slash-head-phrases ensure that the second daughter has a non-empty SLASH value and is a head.

One further question arises about clefts. We have seen that the initial constituent can differ from the gap both in whatever features identify strong pronouns and in person. However, it is not the case there is no relation between the initial constituent and the gap. It seems in fact that the initial constituent and the gap must be of the same category. Thus, the (a) examples in following, where filler and gap are the same category, are grammatical, but not the (b) examples where they are different categories.

- (65) a. Y ferch soniodd Gwyn amdani.
 the girl talk.PAST.3SG Gwyn about.3SGF
 ‘It’s the girl that Gwyn talked about.’
 b. *Am y ferch soniodd Gwyn amdani.
 about the girl talk.PAST.3SG Gwyn about.3SGF
- (66) a. Am y ferch soniodd Gwyn.
 about the girl talk.PAST.3SG Gwyn
 ‘It’s about the girl that Gwyn talked.’
 b. *Y ferch soniodd Gwyn.
 the girl talk.PAST.3SG Gwyn

I assume that this is a result of constraints on the identity relation. I assume that different categories have different types of index and that the identity relation requires indices of the same kind. I also assume that the index of the definite description which is formed from the clause is the same as the index of the gap, an NP index with an NP

¹⁴ Free relatives with *bynnag*, like English free relatives with *ever*, may appear as adjuncts. A more developed analysis would need to ensure that a free relative has the feature specification [MOD S] when it contains *bynnag*, allowing it to modify a clause.

gap, a PP index with a PP gap, and so on. These assumptions will ensure that the initial constituent is an NP if the gap is an NP, a PP if the gap is a PP, and so on.

There are a couple of details that remain to be worked out, but I have now provided a fairly full analysis from analysis of the three Welsh UDCs, which captures the properties that they all have, the properties that just two of them have, and their distinctive properties.

6. Concluding remarks

I have been concerned in this paper with three rather different Welsh UDCs: *wh*-interrogatives, free relatives and clefts. I have outlined their properties and developed an analysis within construction-based HPSG.

As the name suggests, construction-based HPSG assumes constructions. The assumption that constructions exist is controversial. Thus, Chomsky (1995: 6) claims that there are ‘no grammatical constructions of the traditional sort within or across languages’. Developing this idea, Rizzi (2004: 328) argues that there are ‘more elementary computational elements’ and ‘constructions are mere conglomerates of such finer ingredients’. This suggests that constructions have no properties which are not shared with other constructions. On the face of it, this is simply false. The constructions we have been concerned with here and many others have properties of their own. The view within P&P/Minimalism is that such properties stem from typically invisible heads. We noted in section 4 that one might postulate a construction-specific invisible element to handle Welsh clefts but that it is not clear how this is preferable to postulating a construction. We also noted that it is not clear how the invisible head approach could extend to free relatives where it would somehow to have ensure that the initial constituent is the head of the whole construction. If it were possible to attribute all the properties of the constructions to invisible lexical elements, there would still be a problem. For P&P/Minimalism the lexicon is just a list of elements with their properties. Hence there would be no difference between properties of individual constructions and the properties that are shared with other constructions. In short, generalizations would be missed.¹⁵

It often seems to be assumed that approaches which recognize constructions must miss generalizations. However, given an appropriate hierarchical classification of constructions, no generalizations need be missed. As Sag (2007: 2) puts it, ‘there is in fact no inconsistency between the concern for general principles of grammar (even Universal Grammar in Chomsky’s sense) and a construction-based approach to grammatical description’. In the preceding pages, I have developed an analysis of Welsh *wh*-interrogatives, free relatives and clefts which captures their distinctive properties, the properties which they all have, and also the properties that just two of them have. Thus, construction-based HPSG is well equipped to capture the similarities and differences in this area. This is probably not true of some other frameworks.

¹⁵ For further discussion of these issues see Borsley (2006).

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