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A Crosslinguistic Investigation of *Wh*-Internal Structure: Morphology, Macroparameters and the Borer-Chomsky Conjecture.

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Abstract.

I examine the lexical approach to parametric variation known as the Borer-Chomsky conjecture (Baker 2008), suggesting that c-selectional features (Pesetsky 1982) can be a locus of such variation, and further, following Julien (2002), that c-selectional movement triggers underlie the distinction between agglutinative and fusional morphology. When combined with Neeleman and Szendrői's (2007) demonstration that radical pro drop (Huang 1984) patterns with agglutination and Biberauer, Holmberg, and Roberts' (2010) restrictions on the distribution of this movement trigger, this derives a binary parameter linking agglutinative pronominal morphology to radical pro drop via c-selection. After surveying such behaviour in the pronouns of six languages, I consider the *wh*-domain, proposing that *wh*-structure is based on that of pronouns. Furthermore, Watanabe's (1992a,b) proposal of null *wh*-operator movement in Japanese is adapted to link agglutinative *wh*-morphology to *wh*-in situ, leading to a macroparameter connecting three distinct areas of the grammar. I demonstrate wider empirical support for this macroparameter using *The World Atlas of Language Structures Online* (Dryer and Haspelmath 2011), and finally, based on data from American Sign Language, suggest that modality may force parametric underspecification. Thus it is demonstrated that even under the Borer-Chomsky conjecture, macroparametric proposals can be made.

1. Introduction.

The lexical approach to parametric variation that Baker (2008) terms the Borer-Chomsky conjecture, originating with Borer (1984) and later adopted by Chomsky (1995), presents an attractive view of variation from the perspectives of acquisition and minimalism. However, as Baker (2008) notes, it also creates significant empirical problems, leading to a tension between Chomsky's (1965) levels of explanatory and descriptive adequacy. I suggest this tension can be resolved by considering c-selection (Pesetsky 1982) as a locus of parametric variation, and following Julien (2002), I propose that c-selectional movement triggers underlie the distinction between fusional and agglutinative morphology. I consider the consequences of this proposal in detail, adapting Neeleman and Szendrői's (2007) approach to radical pro drop (Huang 1984), where the phenomenon is considered to be a reflex of agglutinative pronominal morphology, then suggesting that morphology has deeper syntactic consequences for the behaviour of *wh*-phrases. To support such considerations, I investigate pronoun and *wh*-structure in a number of languages, ultimately leading to the proposal of a true Borer-Chomskyan macroparameter.

Section 2 starts by introducing the problem the Borer-Chomsky conjecture poses for macroparameters, before demonstrating that c-selectional features and their movement triggers may be considered a Borer-Chomskyan locus of variation. Section 3 then considers the phenomenon of radical pro drop, first adapting Neeleman and Szendrői's (2007) approach to the current framework, before applying this framework to a number of languages, leading to a parametric proposal. Section 4 begins with a consideration of the structure of *wh*-phrases, leading to certain predictions about *wh*-behaviour, which I then show to hold for the languages considered in the previous section, and ultimately propose a Borer-Chomskyan macroparameter. Section 5 then assesses the accuracy of this proposal for a wider range of languages, and section 6 considers American Sign Language, which poses some interesting problems for the hypotheses made, with their explanation potentially leading to a new setting for the macroparameter. Section 7 concludes.

2. C-Selection and the Borer-Chomsky Conjecture.
2.1 The problem of macroparameters.

The principles and parameters (P&P) architecture of government and binding theory (Chomsky 1981) was arguably the most explanatory framework for comparative syntax proposed within the generative paradigm. Under this approach, universal grammar (UG) is viewed as consisting of a number of innate principles, many of which are parametrised, with the values of these parameters being set by the language acquirer, thus potentially explaining both the variant and invariant properties of language in a systematic fashion. One of the most canonical examples of a putative parameter in this tradition is known as the null subject parameter, and it provides a good demonstration of the characteristics of early P&P comparative syntax, while also introducing radical pro drop, an apparently parametric phenomenon which will be examined in later sections.

The null subject parameter has its origins in Perlmutter (1971), and was later extended by Rizzi (1982) and Huang (1984), *inter alia*. It is originally based on the observation that overt pronominal subjects are obligatory in languages such as English and French (termed "non-pro drop"), yet many other languages (termed "pro drop"), including most Romance varieties, do not have this requirement, leading to the following contrast:

(1) a. Ø parla italiano.
        speaks Italian
        'pro speaks Italian.'
     b. *Speaks English.

In their discussion of the parameter, Roberts and Holmberg (2010:16) note that Perlmutter (1971) and Rizzi (1982) link the following properties to a positive value of the null subject parameter:

(2) a. *The possibility of a silent, referential, definite subject of finite clauses.*
        Demonstrated in (1).
     b. *"Free subject inversion."*
        Ha mangiato Giovanni.
        has eaten Giovanni
        'Giovanni ate.'
     c. *The apparent absence of complementiser-trace effects.*
        Chi credi che Ø partirà.
        who think that leave-FUT
        'Who do you think (that) will leave.'
     d. *Rich agreement inflection on finite verbs.*
        A distinct morphological form for each combination of person and number.

(Roberts and Holmberg 2010:16; examples from Chomsky 1981:240)

Such evidence, then, is therefore very much in line with the predictions of early P&P theory, where "[i]n a tightly integrated theory with rich internal structure, change in a single parameter may have complex effects, with proliferating consequences in various parts of the grammar," (Chomsky 1981:6).

However, this wide-reaching picture of a binary null subject parameter was gradually deconstructed, with problems arising from two main perspectives. Firstly, it quickly became clear that Romance-style pro drop was not the only type of null subject language, with Rizzi (1982:143) noting that some languages only allow expletive null subjects. This is perhaps only a small variation on the parameter, but later Huang (1984) demonstrated that many East Asian languages liberally allow null pronouns in both subject and object position, yet have no verbal inflection for person or number. This phenomenon is now known by a number of terms, with perhaps the most common being "radical pro drop," and is demonstrated for Japanese in (3):

(3) a. Ø siken-ni otita.
        exam-DAT failed
        'pro failed the exam.'
     b. Bill-GA Ø settokurusu.
        Bill-NOM persuades
        'Bill persuades pro.'

(Neeleman and Szendrői 2007:672-673)

This behaviour is vastly different from traditional pro drop, and will be considered in more detail in later sections. For the purposes of the current discussion, however, it demonstrates the proliferation

of a simple binary parameter into one with multiple apparent settings. And as noted above, this was not the only difficulty the parameter faced: Gilligan (1987) showed that the properties in (2) do not hold up nearly as robustly as expected when a large range of languages is considered.

Both this difficulty and the proliferation of values of the null subject parameter are discussed in more detail by Roberts and Holmberg (2010). What is important for this work, however, is how this brief discussion demonstrates both the characteristic properties and difficulties encountered by the traditional P&P approach to comparative syntax: initially wide-scale binary parameters were proposed, each value of which was associated with clustering effects throughout the grammar, but with subsequent research this attractive view became harder to maintain, with both binarity and clustering effects being gradually weakened. Baker (2008) discusses this failure of traditional P&P theory, and suggests that it is directly due to such problems that the majority of recent comparative work has focused on more subtle differences between closely related languages or dialects; this is the microparametric approach of e.g. Kayne (2005). Such work is grounded in what Baker (2008) terms the Borer-Chomsky Conjecture (BCC):

(4) All parameters of variation are attributable to the differences in the features of particular items (e.g., the functional heads) in the lexicon.

(Baker 2008:353)

This lexicon-oriented approach to variation first originated in the early days of the P&P approach, with Borer (1984:29) suggesting parameter-setting can thus be seen as a variant of the acquisition of lexical atoms, but perhaps gained most support when it was incorporated into the minimalist program (Chomsky 1995) – if, as this approach assumes, UG should be reduced only to those components which are conceptually necessary, then the "rich internal structure" of early P&P theory is lost, and it becomes difficult to see where parameters should reside if not in the lexicon. Thus it initially seems that the BCC is desirable both from a theoretical as well as an empirical standpoint, but on closer examination, empirical justification becomes more problematic.

Under the BCC, what was previously thought of as large-scale settings of binary macroparameters is typically viewed as the effect of many different microparameters, but this leads to some unexpected predictions. As Baker notes, in a true Borer-Chomskyan world, all parameters should vary equally, leading to "many mixed languages of different kinds, and relatively few pure languages of one kind or another," (Baker 2008:360). When this view is applied to the head parameter, the prediction is therefore that consistently head-initial languages and consistently head-final languages should be exceedingly rare, yet this is not necessarily borne out by the data, with Baker (2008:361-362) suggesting that consistent languages are perhaps more common. Roberts and Holmberg (2010:36-38) add to this criticism with the observation that within dialects, certain features vary more than others; in Italian for instance properties such as clitic behaviour and expression of negation vary between dialects, yet other properties do not – word order is always SVO, and no dialects have full morphological case systems. This contrasts sharply with their common ancestor, Latin, which does have a full morphological case system, along with OV order. Such diachronic behaviour is not expected under the BCC, which predicts random drift in the values of all microparameters, meaning we should expect to see certain dialects which retain properties such as OV order. In essence, then, the BCC has no real support for typological change, with typology itself being explained only in terms of historical accident.

Such considerations therefore lead us to a dilemma. The BCC appears to be a theoretical improvement over previous P&P approaches, and is very productive at the microparametric level, but has no clear support for macroparameters. This would be unproblematic if language genuinely displayed the unstructured properties that it predicts, but patterns of variation suggest, if anything, the existence of macroparameters alongside microparameters. Baker provides one potential solution to this problem: to make use of non-Borer-Chomskyan macroparameters, which affect the core properties of the grammar, alongside Borer-Chomskyan lexical microparameters[1]. However, this view is perhaps not ideal, as it seems both unlikely and in opposition to the minimalist program that the core properties of grammar should be allowed to vary, and furthermore, much of the theoretical desirability of the BCC is lost if it explains only one type of parameter. Ultimately then, retaining the BCC rests on explaining the apparent macroparametric properties of language variation in terms of featural variation in the lexicon alone. In the remainder of this dissertation, therefore, I intend to demonstrate that c-selectional features have the potential to be a site of variation that is both macroparametric and consistent with the BCC.

2.2 C-selection as a locus of (macro)parametric variation.

In order to consider c-selectional features from a parametric perspective, it is first necessary to examine the BCC more closely to determine just what kind of featural variation is permitted. Chomsky (1995:6) suggests that variation should be restricted to "formal features of functional categories," a slightly stronger statement than (4) as this reduces parametric variation only to differences in "features that are accessible in the course of the computation," (Chomsky 1995:230). Adopting the Probe-Goal Agree system of Chomsky (2000,2001,2004), we can assume these to be categorial features, case features, and ϕ-features, along with movement triggers (EPP features, and possibly the edge features of Chomsky 2008). Under this system, a head bearing unvalued[2] features acts as a probe, which undergoes a long distance Agree relation with a c-commanded goal in order to value its features, thus preventing the derivation from crashing. Thus we can summarise the types of variation admitted by the BCC in (5):

(5)   a. *Variation in features, e.g.:*

Agree   **no Agree**

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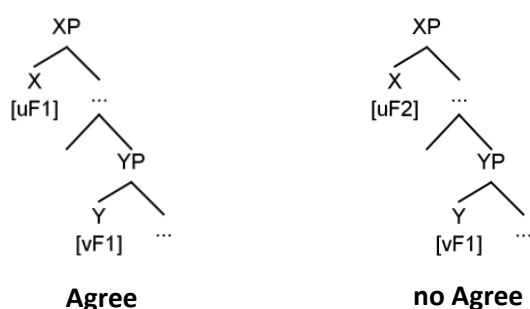
[1] In fact, Baker argues only these parameters are true macroparameters, with the null subject parameter being more of a "medioparameter" due to its effects on the grammar in comparison to the wide-reaching effects of varying the core properties of the grammar. As I do not consider Baker-style macroparameters, I use the term more liberally, with "macroparameter" simply referring to parameters which exhibit clustering effects and concern more than subtle differences between varieties.

[2] I assume uninterpretable features to be equivalent to unvalued features, and interpretable to be equivalent to valued throughout.

b. *Variation in movement triggers, e.g.:*

| movement | no movement |
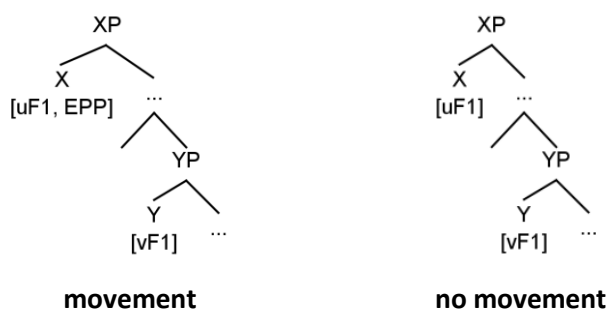
How, then, does c-selection fit into such a system? That heads should be able to select complements independently of meaning has been suggested since Chomsky (1965), termed "strict subcategorization." This has been much debated, with for example Grimshaw (1979) arguing all selection is ultimately semantic, and Pesetsky (1982) (who introduced the term "c(ategorial)-selection) suggesting that many seemingly c-selectional properties of verbs are in fact a result of case assignment. This is not necessarily the dominant view, however, with for instance Chomsky and Lasnik (1993:517) suggesting there remains a purely syntactic component to selection, and Pollard and Sag (1987:121-129) arguing at length that some kind of c-selection is necessary, including their observation that verbs similar in meaning show idiosyncratic selection of complements:

(6) a. Kim grew poetical.
    b. *Kim grew a success.
    c. *Kim grew doing all the work.
    d. Kim grew to like anchovies.

(7) a. Kim ended up poetical.
    b. Kim ended up a success.
    c. Kim ended up doing all the work.
    d. *Kim ended up to like anchovies.

(Pollard and Sag 1987:123)

Furthermore, as Ian Roberts (p.c.) suggests, such variation is equally present crosslinguistically. Provisionally then, it seems possible to admit c-selection as part of the grammar in addition to s-selection, meaning that complement selection is at least in part idiosyncratic, and so may be subject to somewhat arbitrary restrictions.

In terms of the theory at hand then, we can include c-selectional features in addition to the features listed above. In order to explain their operation, I make use of Rizzi's (2008) suggestion that Agree is a subcase of the general operation Search, which can take place either internally (leading to Agree), or externally (i.e. with the probe in the numeration), leading to selection. We can therefore suppose that c-selectional features are of a similar nature to more familiar formal features, taking both valued and unvalued forms, with each head necessarily being valued for its own c-selectional feature. Thus the statement that X c-selects Y is equivalent to X carrying a [uY] c-selectional feature, which probes the [vY] features on Y, leading to valuation and subcategorisation.[3] It therefore seems

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[3] One potential difficulty with this account is that in many situations, such as verbal c-selection of complements, we would expect a single head to c-select many different complements. In the current system,

reasonable that c-selectional features should be able to undergo the same variation as in (5a), with different languages arbitrarily making use of different complements. Such variation is both compatible with the BCC and has potential to have very wide-reaching effects. For instance, Bošković's (2008) claim that some languages systematically lack D, with many robust consequences, could potentially be subsumed under this type of variation – in such languages, no heads carry [uD] c-selectional features. Thus macroparametric variation may already be expressible in such a system; next, however, we will see that possible variation in c-selectional features may be more comparable still to that of other formal features, leading to even more macroparametric potential.

2.3 Head movement, antisymmetry, and roll-up movement.

Briefly leaving c-selection aside, it is worth noting that the only movement that can result from parametric settings of the BCC described thus far is phrasal – EPP features lead to A-movement, and edge features lead to A'-movement. Missing, then, is an account of head movement, which is ultimately a result of Chomsky's (2001:37-38) argument that such movement is not, in fact part of narrow syntax, which stems from a number of suggestions including a putative lack of effect on LF interpretation of sentences. Roberts (2010), however, argues strongly against this conclusion, suggesting both that the reasons for the abandonment of syntactic head movement are unfounded, and also that excluding head movement from narrow syntax requires making unjustified restrictions on internal merge. His argument is that head movement occurs only when a defective goal is probed, defined as follows:

(8) A goal G is defective iff G's formal features are a proper subset of those of G's Probe P.

(Roberts 2010:62)

For instance, in the case of cliticisation, clitics are taken to be bare φPs, which have only the feature bundle [vφ], in contrast to the goal, which has the bundle [uφ] among other features. Agree leads to identical bundles at two places in the tree, which are viewed as non-distinct at PF, and thus under Nunes' (2004) approach to copy deletion, the lower copy is deleted, leading to the appearance of head movement. This approach crucially makes use of Kayne's (1994) Linear Correspondence Axiom (LCA), both to explain copy deletion and to ensure only left adjunction of clitics, which Roberts formulates thus:

(9) If α asymmetrically c-commands β, then α linearly precedes β.

(Roberts 2010:53)

The LCA therefore leads to rigid specifier-head-complement order, which I assume throughout the rest of this work.

We are now in a position to return to c-selection. If, as we supposed above, c-selectional features are also formal features, then there is no reason that head movement shouldn't apply, assuming the head in question meets the requirement of defectivity in (8). As an example of this requirement

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however, this would mean such heads carrying multiple unvalued features, only one of which would be valued, potentially crashing the derivation. However, it is possible that this can be solved by c-selectional features being chosen from a possible range when heads enter the numeration.

being met, assume three abstract heads X, Y, and Z, each of which c-selects the next as its complement. The heads are, therefore, minimally featurally specified as follows:

(10)   X   Y   Z
           [vX]   [vY]   [vZ]
           [uY]   [uZ]

If we first consider Y as P and Z as G, it is clear that (8) is true, and thus head movement should result:

(11)

Assuming (following Chomsky 2001) that once valued, unvalued features become invisible to the computation, [vY] should be left as the only feature on Y. The requirements of (8) thus hold once more, this time with X as P and Y as G, leading to the following structure:

(12)

The ultimate order is therefore Z-Y-X, the exact opposite of the original order of subcategorisation, and furthermore, any higher heads (if similarly minimally specified) would lead to the same head movement effect. If we assume that word-internal heads are minimally c-selectionally specified in the manner shown, then this is (albeit by stipulation) a potential explanation of Baker's (1985) Mirror Principle: that morphological order is a reflection of syntactic order, with head movement being an automatic consequence of c-selection.[4]

Julien (2002) similarly derives the Mirror Principle in terms of c-selection, but makes use of Holmberg's (2000) approach to c-selection, cast in terms of checking theory (Chomsky 1995), which she summarises as follows:

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[4] One difficulty with Roberts' (2010) account of head movement is that it expressly prevents movement of formal features that are not already present, at least in unvalued form, on the probe. Therefore, if formal features in addition to those on the probe are required for the realisation of the lexical item associated with the goal, then it appears that no head movement should take place. In many cases, however, this is exactly the kind of head movement that we want to occur, and so it is unclear how or if Roberts' approach should deal with this. I assume, however, that such head movement is possible whether by Roberts' mechanism or otherwise, and make extensive use of it in the following sections.

(13) A selectional feature of a head Y^0 selecting a complement XP may be checked:
      a.   By movement of the X feature to Y^0.
      b.   By head movement of X^0 to Y^0.
      c.   By movement of XP to the Spec of YP.

(adapted from Julien 2002:63)

By applying Roberts' (2010) theory to c-selection, we have recast both (13a) and (13b) in terms of the Probe-Goal Agree system: (13b) is the head movement that results when G is defective, and (13a) is the matching that takes place when G is not defective. We now consider (13c).

The movement described in (13c) has neither the characteristics of head movement nor of familiar phrasal (A- and A'-) movement. Nonetheless, as originally noted by Kayne (1994:52-53), this "roll-up" movement is required to derive consistently head-final languages when the LCA is applied – if such movement occurs successively for every phrase in a tree, then the structure resulting is left-branching:

(14)

no roll-up   roll-up (ignoring copies)
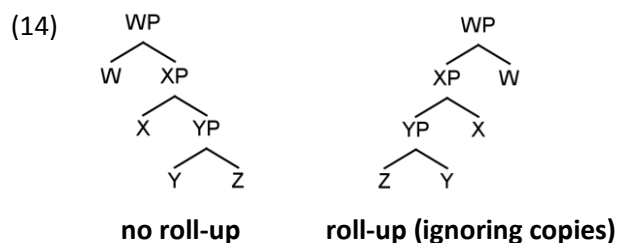
Biberauer, Holmberg and Roberts (2010, henceforth BHR) term such movement "L(inearization)-movement," and suggest that it results when c-selectional features are associated with a generalised movement trigger which they term "^," (BHR:65-66). Essentially then, L-movement can be considered the c-selectional equivalent of A'- and A- movement, as they demonstrate with the following examples:

(15) a. $T_{[u\phi, \wedge]}$ triggers movement of the goal of the probe [uϕ] to Spec,TP.
     b. $C_{[EF, \wedge]}$ triggers A'-movement.
     c. $V_{[\_D, \wedge]}$ triggers movement of the complement DP of V to Spec,VP.

(BHR:66)

Furthermore, they argue that the distribution of the ^ trigger is constrained as follows:

(16) If a head α_i in the Extended Projection E of a lexical head has ^ associated with its selection feature for a lower head α_{i+1}, then so does α_{i+1}.

(BHR:66)

Where "Extended Projection" is an adaptation of Grimshaw's (1991) notion. Thus ^ can only be distributed monotonically from the bottom of E, skipping no heads. From this, BHR derive the Final-over-Final Constraint (FOFC), a constraint on phrase structure configuration with considerable empirical support, which can loosely be stated as follows:

(17) If α is a head-initial phrase and β is a phrase immediately dominating α, then β must be head-initial. If α is a head-final phrase, and β is a phrase immediately dominating α, then β can be head-initial or head-final.

(BHR:3)

Thus the constraint on distribution in (16) has a remarkable effect on the output of the grammar. For our purposes, however, it is worth noting that it also has the potential to constrain the learner's hypotheses when determining the distribution of ^ in E – if a higher head can be seen to have ^, then (16) allows the learner to determine that all the lower heads in that extended projection must also have ^. This considerably limits the hypotheses the learner must make, and will be made use of in later sections.

2.4 Summary: c-selectional variation permitted by the BCC.

Our examination of c-selectional features has shown that they can in fact be viewed as very similar to other formal features – if we compare, for instance, c-selectional features with φ-features, the parallels are obvious:

	Probe	Goal	
φ-features	[uφ]	[vφ]	Agree
	[uφ]	[vφ] (defective)	head movement
	[uφ, ^]	[vφ]	A-movement
c-selectional features	[uX]	[vX]	subcategorisation
	[uX]	[vX] (defective)	head movement
	[uX, ^]	[vX]	L-movement

Table 1: C-selectional features compared to φ-features.

It seems reasonable therefore that under the BCC, c-selectional features should be subject to exactly the kind of parametric variation φ-features can be subject to, and so we can assume that c-selectional features have three dimensions of variation – in terms of their values (i.e. which heads are c-selected for), in terms of their defectivity (i.e. when head movement occurs), and in terms of the presence or absence of ^ (i.e. when L-movement occurs).[5] It is possible that variation in all three of these dimensions could lead to macroparametric effects, but in the remaining sections of this thesis I will largely examine the potential consequences that ^ can have on the internal structure, and thus behaviour, of pronouns and *wh*-elements.

3.   Radical Pro Drop and Pronoun-Internal C-Selection.
3.1 Neeleman and Szendrői (2007): a realisational approach to radical pro drop.

The phenomenon of radical pro drop was introduced above in section 2.1 as an apparent setting of the null subject where both subjects and objects may be liberally dropped, despite the verbs of such languages having no agreement inflection; example (3) of this phenomenon in Japanese is repeated below:

(18) a. Ø siken-ni otita.
        exam-DAT failed
        'pro failed the exam.'
    b. Bill-GA Ø settokurusu.
        Bill-NOM persuades
        'Bill persuades pro.'

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[5] One question left open here is what operation takes place when a probe with ^ probes a defective goal – should head movement or L-movement take place? *Pace* Roberts (2010:61-62), I assume that only L-movement takes place, which is consistent with Julien's (2002) system.

Perhaps unsurprisingly, many approaches to radical pro drop attempt to explain it in terms of this poor agreement inflection (see e.g. Huang 1984, Rizzi 1986, Kuroda 1988, Jaeggli and Safir 1989, Saito 2007). Neeleman and Szendrői (2007, henceforth N&S), however, take a somewhat different approach, which relies on the following observation:

(19) *Radical Pro Drop Generalisation*
    Radical pro drop requires agglutinating morphology on pronouns.

<div align="right">(adapted from N&S:673)</div>

This somewhat unexpected generalisation is explained in realisational terms – following e.g. Sproat (1985), Halle and Marantz (1993) and Jackendoff (1997), N&S assume that the insertion of phonological material occurs at PF, with the syntax consisting purely of featural representations. Furthermore, they suggest that realisation can be of non-terminals as well as terminals, as suggested by Weerman and Evers-Vermeul (2002) and Starke (2011). Thus realisational rules can be divided into at least two classes: those that realise heads, and those that realise phrases and so larger sections of trees. For example, N&S assign Japanese the spell-out rules in (21), given the general structure in (20) that they assume for pronouns[6]:

(20)

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        KP
       /  \
      K    DP
          /  \
         D    NP
             /  \
            N    …
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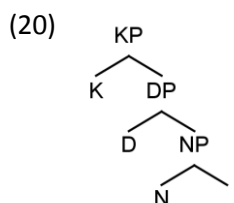
(21) $[_{NP}$ +p, -a, 1, SG] $\leftrightarrow$ /watasi/ $[_K$ NOM] $\leftrightarrow$ /ga/
    $[_{NP}$ +p, -a, 2, SG] $\leftrightarrow$ /anata/ $[_K$ ACC] $\leftrightarrow$ /o/
    $[_{NP}$ +p, -a, 3, SG, M] $\leftrightarrow$ /kare/ $[_K$ DAT] $\leftrightarrow$ /ni/
    $[_{NP}$ +p, -a, 3, SG, F] $\leftrightarrow$ /kanozyo/ $[_K$ GEN] $\leftrightarrow$ /no/
    $[$PL$]$ $\leftrightarrow$ /tati/; /ra/

<div align="right">(N&S:688)</div>

Thus the agglutinating case and plural morphology that Japanese exhibits, along with the seemingly more fusional behaviour of the nominal component of pronouns, can be explained in terms of spell out rules – case is a head-level spell-out of the K head, whereas pronouns are a phrase-level spell out of the NP head. Thus "[a]pplication of these rules generates forms like *kare-ra-ga* 'he-PL-NOM' ('they')," (N&S:688). These agglutinative rules contrast with those of truly fusional languages such as Dutch, where each pronoun is spelt out by one rule at the KP level, e.g.:

(22) $[_{KP}$ +p, -a, 3, SG, M, ACC] $\leftrightarrow$ /hem/

<div align="right">(N&S:682)</div>

How, then, does radical pro drop occur? N&S suggest that in radical pro drop languages, the following rule may optionally apply:

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[6] KP is a case phrase in the sense of Bittner and Hale (1996) and Neeleman and Weerman (1999). N&S assume this structure to be largely universal throughout their discussion, but note that "[i]t is conceivable that there is some crosslinguistic variation in the makeup of the extended nominal projection," (N&S:679).

(23) $[_{KP} +p, -a] \leftrightarrow \emptyset$

This rule must be constrained from applying in fusional languages, however, and N&S suggests this is a result of the Elsewhere Principle (e.g. Kiparsky 1973), which they formulate as follows:

(24) Let R_1 and R_2 be competing rules that have D_1 and D_2 as their respective domains of application. If D_1 is a proper subset of D_2, then R_1 blocks the application of R_2 in D_1.

This amounts to the statement that when two rules are in competition, the more specific one "wins," preventing the more general rule from applying. As is clear, this is the case for rules (22) and (23) – both are competing for the realisation of KP, but (22) is the more specific, and so zero spell-out of pronouns is blocked in Dutch and in languages with fusional pronouns more generally. In those with agglutinative pronouns, by contrast, there is no other rule competing for the realisation of KP, as all spell-out rules with phonological content apply at a lower level of structure, as can be seen for Japanese in (21). Thus (23) has no competition and so is able to apply, allowing for radical pro drop.

N&S therefore explain the generalisation in (19) in terms of late phonological spell-out and the Elsewhere principle, and so radical pro drop is not considered to be a result of weak agreement inflection, with this additional property being explained "either in functional terms [or] in terms of restrictions on context-sensitive spell-out rules, or both," (N&S:687,fn.12). Despite this potential weakness, N&S show that the generalisation holds in a wide range of cases, thus giving it considerable empirical support. They note, however, that the rule in (23) may not, in fact be universal, with languages such as Finnish showing agglutinative pronominal morphology without radical pro drop (N&S:705), and so the claim in (19) is that all radical pro drop languages have agglutinating morphology, without the stronger biconditional claim.

3.2 N&S in the light of Julien (2002).

While N&S crucially make use of the difference between agglutination and fusion, they do not attribute this distinction to any syntactic property, instead suggesting it results merely from the spell-out rules particular languages happen to have. This contrasts with Julien (2002), who instead suggests that agglutination is a consequence of head-final structure. Fundamental to Julien's thesis is her assumption that words do not have special significance in the syntax and are instead distributionally-defined sequences of functional heads; furthermore, and unlike N&S, she assumes the LCA. Thus she suggests following Kayne (1994:52-53) that head-final languages are derived by roll-up movement of the type described in section 2.4, deriving for instance the OVTC order of Japanese:

(25) a.
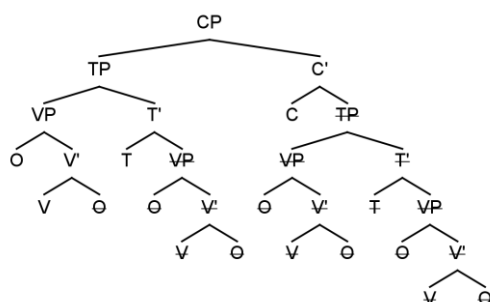
b. Ø ringo-o tabe-mashita ka?
   apple-ACC eat-PAST.POLITE Q
   'Did pro eat the apple?'

The inflected verb is thus a combination of the heads V and T, which are in hierarchically distinct positions in the structure and are so unable to undergo fusion, yet are interpreted as a single word, and thus agglutinative morphology results, a conclusion just as applicable in the nominal domain. Thus she predicts head-final languages to be "suffixing and agglutinating" with "no fusion of morphemes in the syntax," (Julien 2002:165) a hypothesis which she shows to be well supported empirically. Fusion, then, instead results from words formed by head movement, and so we can apply Julien's prediction to the structure in (20) given for pronouns by N&S to contrast (for example) Dutch with Japanese:

(26)

**Dutch (fusional)**   **Japanese (agglutinating)**
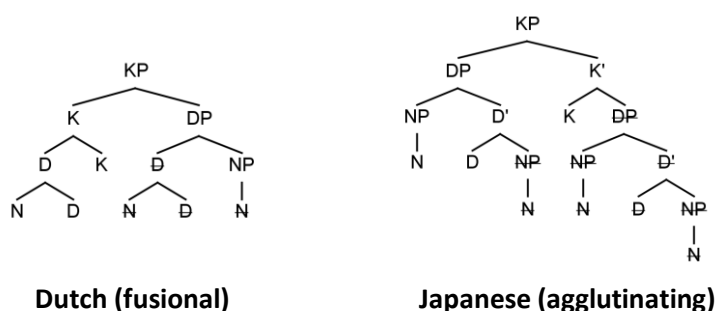
How then, if at all, does this approach fit with N&S-style spell-out rules? Under the N&S approach, spell-out rules can target different levels of structure fairly arbitrarily, yet it seems that under a Julien (2002) approach, we should want spell-out rules only to apply to heads, a perspective that would invalidate the N&S theory of radical pro drop.

However, by taking an acquisitional perspective, it is possible to explain a way in which the two theories could be compatible. We can first suppose that when the learner sees agglutination, a roll-up structure is assigned, along with appropriate spell-out rules. In the case of fusion, then, the learner instead presumes consistent head movement, but when assigning spell-out rules, a problem arises – should a phrase- or head-level rule be used? For instance, in the case of the Dutch tree in (26), a spell-out of both KP and of K would lead to a fusional appearance at PF. A head-level rule, however, would not be in competition with the radical pro drop rule of (23), thus preventing N&S's account from applying. We are forced, therefore, to assume that head-level spell-out rules cannot apply to complex heads for both accounts to work, but this is not necessarily such an unnatural stipulation. It may, for instance, result from a restriction on the form of such spell-out rules – either that they can only apply to the realisational features associated with that head in the lexicon, or more strongly, that they can only spell out a single feature bundle. While such considerations require a more detailed study of the restrictions on spell-out rules, we can tentatively conclude that Julien's (2002) approach is compatible with N&S's account of radical pro drop, leading us to the perhaps overly strong, but nonetheless quite desirable result that fusion reflects underlying head movement, and agglutination reflects a roll-up structure.

In terms of the c-selectional theory put forward in section 2, then, we can therefore say that in Japanese, each head in the pronominal projection has ^ associated with its c-selectional features, and in Dutch, no heads have this trigger associated with their c-selectional features. This leads to the

question of which options are available other than consistent head movement or consistent L-movement, but it readily becomes apparent that the word-internal possibilities (i.e. those where, as we supposed above, head movement is the default) are very constrained, both as a result of the possible distributions of ^, and of the nature of phrasal spell-out rules. Firstly then, as (following BHR) ^ must be distributed monotonically from the bottom of the extended projection, structures involving head movement lower in the projection and L-movement higher up are ruled out, e.g.:

(27)*

```
            WP
           /  \
          XP    W
         /  \
        YP    X
       /  \
      Y    ZP
     / \    |
    Z   Y   Z
```
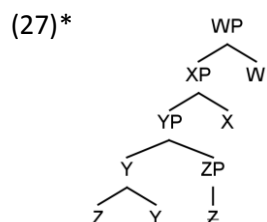
Secondly, if, as assumed above, head-level spell-out rules cannot apply to complex heads, then structures involving head movement must be spelt out at the phrase level, making structures with lower L-movement and higher head movement impossible for the learner to predict. For instance, in (28), the complex head W would have to be spelt out by a WP-level rule, thus leading to a fusional phonological output and the hypothesis of consistent head movement:

(28)*

```
          WP
         /  \
        W     XP
       / \   /  \
      X   W YP   X
           / \
          Y   ZP
               |
               Z
```
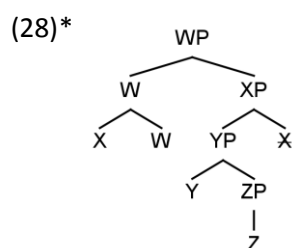
Thus there are only two word-internal possibilities: consistent head movement (29a) and consistent L-movement (29b):[7]

(29)a.

```
               WP
              /  \
             W     XP
            / \   /  \
           X   W X    YP
          / \   / \   / \
         Y   X Ɏ   X Ɏ   ZP
        / \   / \   / \   |
       Z   Y Z   Ɏ Z   Ɏ  Z
```

b.

```
          WP
         /  \
        XP    W
       /  \
      YP    X
     /  \
    ZP    Y
     |
     Z
```
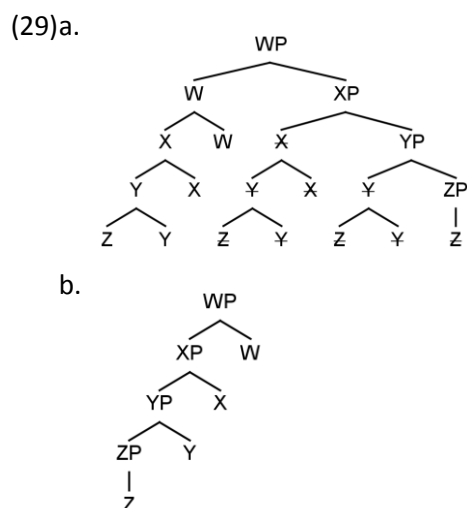
In the case of fusional morphology, (29a) is assigned, and ^ is associated with none of the heads' c-selectional features, and if there is some suffixal agglutination, (29b) is assigned, and ^ is associated

---

[7] In non-word-internal situations, where head movement is not the default, we should expect several more possibilities, which is reflected by the wide crosslinguistic variation in clausal structure.

with all of the heads' c-selectional features. It is worth noting that agglutination need not necessarily be "absolute," with only head-level spell-out rules being used, for (29b) to be assigned – so long as there is evidence for the agglutination of higher heads, then the learner will postulate consistent L-movement, with any apparent fusion lower in the tree being explained in terms of phrasal rather than head-level spell-out rules. As we will see below, many languages exhibit this behaviour, and so we can distinguish phonological fusion and agglutination (resulting from phrase- and head-level spell-out rules respectively), which may be partial in some cases, from *syntactic* fusion and agglutination, which reflects underlying structural differences and must be word-internally absolute.

The constraints on these syntactic options mean that the learner need only look at the highest head in the pronominal projection to determine the underlying structure associated with pronouns – if, following N&S, this highest head is K, we can state the available options as follows:

(30)   Is ^ associated with the c-selectional features of pronominal K?

                              Yes   No
                consistent L-movement   consistent head movement

These options clearly have parametric implications for the availability of radical pro drop, a point which we shall return to below. Before coming to such conclusions, however, it is necessary to refine N&S's structure for pronouns, and demonstrate the theory advanced above for some specific languages, which is the focus of the following sections.

3.3 A more fine-grained structure for pronouns: Déchaine and Wiltschko (2002).

As we have seen above, N&S assign pronouns the simple structure given in (20), repeated below:

(31)   KP
           / \
          K   DP
              / \
             D   NP
                 / \
                N   …

While N&S largely assume this to be the general structure for pronouns throughout their analysis, they readily admit it may be subject to crosslinguistic variation (see footnote 6), though they do "take KP and NP to be universal," (N&S:679). For our purposes, however, the structure in (31) is overly simplistic. The first reason for this is the assumption that head-level spell-out rules must refer only to features associated with that head, which is problematic when the structure is this general, as it is unclear which head even features such as person and number are associated with. The second reason is that this structure is inadequate for demonstrating crosslinguistic differences in structure, which is important both for this section, and for section 4, where pronouns are compared with *wh*-elements. Thus I adopt a more specific theory of pronoun-internal structure.

There are many proposals that pronouns have complex internal structure (e.g. Cardinaletti 1994, Ritter 1995, Noguchi 1997, Cardinaletti and Starke 1999, Déchaine and Wiltschko 2002, Panagiotidis 2002), all of which contrast with the earlier view that pronouns are simply DPs (Postal 1966, Abney 1987). In particular, I adapt the approach of Déchaine and Wiltschko (2002, henceforth D&W), who propose that there are three possible types of pronouns – pro-DPs (32a), pro-ϕPs (32b), and pro-NPs (32c):

(32)a.

```
        DP
       /  \
      D   ΦP
         /  \
        Φ   NP
            |
            N
```

b.

```
      ΦP
     /  \
    Φ   NP
        |
        N
```

c.

```
    NP
    |
    N
```
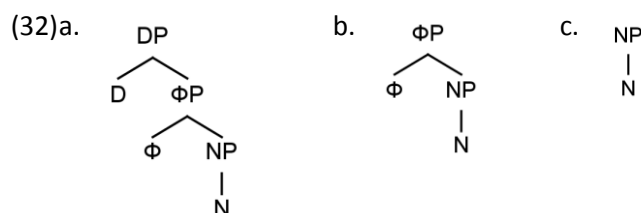
(D&W:410)

The properties of these pronouns are summarised thus:

	Pro-DP	Pro-φP	Pro-NP
Internal syntax	D syntax; morphologically complex	neither D syntax nor N syntax	N syntax
Distribution	argument	argument or predicate	predicate
Semantics	definite	-	constant
Binding-theoretic status	R-expression	variable	-

Table 2: D&W's comparison of pronoun properties.

(D&W:410)

However, I modify this approach in one major respect – following N&S, I take KP to be universal, an assumption which is potentially problematic for the distributional criteria D&W use; as they note, assuming only internal structure differs "begs the question of how syntax can "see" the internal structure of a DP," (D&W:409). The validity of this conclusion is unclear, but the English examples given do not seem to show very sharp distributional contrast: for instance, the following pair is given to contrast 3rd person pronouns (putative φPs) with demonstratives (putative DPs):

(33)a. That's [*her*]PRED.
    b. *She's [*that*]PRED.

(D&W:425)

D&W (p.425) note that this "does not provide conclusive evidence for … predicative status," pointing out that English 1st and 2nd person pronouns can also appear in these positions, despite being putative DPs. In addition to this, the judgement in (33b) does not seem entirely correct, with *she's that* perhaps being ruled out for semantic rather than syntactic reasons, and perhaps being marginally acceptable in some contexts:

(34)A: (discussing a radar display) Which symbol is she?
    B: (pointing) ?She's that.

Thus for theoretical and potentially for empirical reasons, I leave aside the distributional criterion, but make use of the other three in my analyses.

Finally, as noted above, the current approach with restricted head-level spell-out rules favours heads that are featurally simple. D&W (p.410) state that "φ-features include number and gender, and in some cases person," and so I decompose φP into PersP, GenP, and NumP (see Bosque and Picallo 1996 for the low position of Gen and Num in Spanish), which also has the advantage of allowing crosslinguistic variation in the presence of the inflection associated with these heads to be explained

in c-selectional terms. Thus I make use of the following general structure for pronouns, with only KP and NP being constant across languages:

(35)
```
        KP
       /  \
      K    DP
          /  \
         D   PersP
             /   \
          Pers   GenP
                /    \
              Gen   NumP
                   /    \
                 Num    NP
                         |
                         N
```
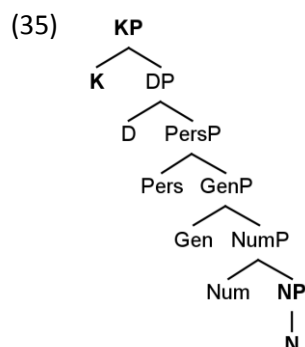
In the follow sections, I apply this structure to the pronouns of a number of languages, demonstrating the approach to radical pro drop outlined above, which combines N&S's theory with the idea that structural differences underlie fusion and agglutination.

3.4 Pronoun internal structure in radical pro drop languages.
3.4.1 Mandarin Chinese.

N&S (p.689) give the following spell-out rules for Chinese:

(36) [$_{NP}$ +p, -a, 1, SG] ↔ /wǒ/   [$_K$ …] ↔ /∅/
     [$_{NP}$ +p, -a, 2, SG] ↔ /nǐ/   [POSS] ↔ /de/
     [$_{NP}$ +p, -a, 3, SG] ↔ /tā/   [PL] ↔ /men/

This analysis can largely be retained in the current model, although *-de* and *-men* call for reanalysis. Though there is debate over the exact nature of *de* (see e.g. Cheng 1986, Dikken and Singhapreecha 2004), I assume for simplicity that it is a realisation of genitive case, chosen over the null realisation due to the Elsewhere Principle. However, *-men* poses more of a difficulty. The three NP-level rules realise person, and so under the current system, we should expect them to be spell-outs of PersP, but this would subsume NumP, so it is unclear how plurality should fit into the system. There is nevertheless considerable debate over whether *-men* is, in fact, a true marker of plurality, with e.g. Chao (1968), Iljic (1994), and Cheng and Sybesma (1999), *inter alia*, arguing otherwise. However, Li (1999) suggests that *-men* does indeed originate in Num, but moves to D, with pronouns and proper names originating in D:
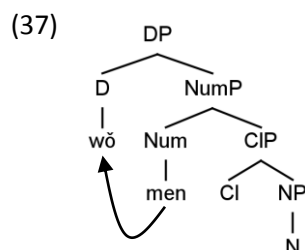
(37)
```
          DP
         /  \
        D   NumP
        |   /   \
       wǒ  Num   ClP
            |    /  \
           men  Cl   NP
                      |
                      N
```
(Li's 1999 approach to *-men*; ClP is a classifier phrase)

This explains the non-standard "collective" interpretation of *-men* (38), along with the fact that it is restricted to definite contexts (39):

(38) XiaoQiang-men shenme shihou lai?
     XiaoQiang-MEN what time come?
     'When are XiaoQiang and the others coming?'

(Li 1999:78, citing Iljic 1994)

(39) a. you ren
        have person
        'there is/are some person(s)'
     b. *you ren-men
        have person-MEN

(Li 1999:77)

Li (1999) also attempts to explain the difference between pronouns/proper nouns and common nouns with respect to the occurrence of post-nominal quantity expressions alongside *-men* – while pronouns and proper nouns allow this, common nouns do not:

(40) a. wo qing ta-men sange (haizi) chifan.
        I invite them three-CL (child) eat
        'I invited them three-CL (children) for a meal.'
     b. *wo qing pengyou-men sange (ren) chifan.
        I invite friend-MEN three-CL person eat
        'I invited three friends for a meal.'

(Li 1999:79)

This is said to result from Travis' (1984) Head Movement Constraint – common nouns must raise from N to Num to D, and the first stage of this movement is blocked if there is an intervening ClP:

(41)
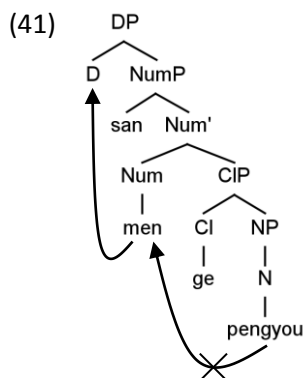
The approach taken by Li (1999), then, makes quite distinct assumptions from those made here. Firstly, agglutinative linear order is assumed to result from head movement, but from the current perspective, this results from L-movement. Furthermore, under the approach to head movement that we have been following throughout, the Head Movement Constraint is assumed not to exist (Roberts 2010:193), and so it is not clear whether Li's (1999) analysis of common nouns carries across. Important for current purposes, however, is the association of *-men* with D – if we combine the insight of earlier approaches such as Iljic (1994), which view *-men* as a marker of collectivity rather than plurality with Li's (1999) observation that it must be definite, we can tentatively suggest that *-men* is the spell-out of a D head with a collective denotation.[8] This is further supported by the

---

[8] This gives no explanation for the differences between proper nouns and common nouns, but as the focus is on the pronominal domain, I leave these concerns aside.

observation that Chinese pronouns do not function as bound variables with quantified NPs as antecedents (Aoun and Li 1993, Liu 1997):

(42)*?Meige xiaohai$_i$ dou xihuan ta$_i$ de mama.
      Every child all like he DE mother
      'Every child$_i$ likes his$_i$ mother.'
      ≠ ∀x, child x & x loves x's mother

                                      (adapted from Liu 1997:87)

This, then, is consistent with Chinese pronouns being pro-DPs in D&Ws framework, and so we can propose the following analysis (leaving aside ClP):

(43) a.

```
              KP
            /    \
          DP      K
         /  \
      PersP   D
      /   \
    NP    Pers
     |
     N
```

b. [$_{PersP}$ +p, -a, 1] ↔ /wǒ/   [$_K$ …] ↔ ∅
   [$_{PersP}$ +p, -a, 2] ↔ /nǐ/   [$_K$ GEN] ↔ /de/
   [$_{PersP}$ +p, -a, 3] ↔ /tā/   [$_D$ COLL] ↔ /men/

Thus Chinese pronouns fusionally inflect for person, and are agglutinative for K and D, both allowing the learner to postulate a roll-up structure, and leading to radical pro drop.

3.4.2 Japanese.

N&S's analysis for Japanese pronouns is given in section 3.1 – given the structure in (20), they suggest it has the spell out rules in (21). Thus the pronouns are analysed as being fusional for person and gender, and agglutinative for number and case, which is problematic for the tree in (35), as we would expect a phrasal (and thus fusional) spell-out of PersP to subsume number as well as gender and person. Furthermore, this analysis is inconsistent with D&W's (p.417) approach, with the pronoun *kare* being a canonical example of a pro-NP, given its inability to function as a bound variable (44), and its ability to be modified by adjectives, possessives, and demonstratives (45):

(44)*Daredemo$_i$-ga *kare$_i$-no hahaoya-o asisite-iru.
     everyone-NOM he-GEN mother-ACC love-PRES
     'Everyone$_i$ loves his$_i$ mother.'
     ≠ ∀x, x loves x's mother

                         (adapted from Noguchi 1997:770, D&W:417)

(45)a. tiisai *kare*
     small he
     'he who is small'
  b. watasi-no *kare*
     I-GEN he
     'my boyfriend'
  c. kono *kare*
     this he
     'this guy here'

                               (Noguchi 1997:777, D&W:417)

D&W's decision to treat *kare* as an NP is further in line with traditional analyses that Japanese "pronouns" are in fact common nouns (Kuroda 1965), and draws heavily on Noguchi's (1997) view that Japanese pronouns are pronominal, but are categorically Ns. Treating Japanese pronouns as Ns, then, seems to be the correct approach, but this comes into conflict with defining these pronouns in terms of their ɸ-featural values, as in the analysis of N&S. However, this difficulty is resolved when we consider that unlike English pronouns, Japanese pronouns are open-class, with Noguchi (1997:778) stating that "Japanese personal pronouns … are not paradigmatic," noting that unlike in English they can undergo semantic shifts, as seen in (45b). Furthermore, multiple items with distinct referential properties exist for each putative combination of ɸ-features – for instance, *kare* has been analysed as denoting [MALE] and [MARRIAGEABLE AGE] (D&W:248 citing Baggaley 1998:49 citing Sugamoto 1989:270), and exists alongside other seemingly third person masculine pronouns such as *ore* and *boku*, which themselves denote different properties (see also Panagiotidis 2002:30-33 for a discussion of the open-class nature of Japanese pronouns). Thus the referential properties of Japanese pronouns cannot be described in terms of formal features, further suggesting they are realisations of N, with D&W (p.418,fn.10) noting that features such as gender can be both lexical and functional, as in the case of German *Mädchen* 'girl,' which is grammatically neuter but lexically denotes [FEMALE]. Thus it is entirely plausible to presume Japanese pronouns are spell-outs of N (or perhaps NP), with there being no evidence for the existence of PersP or GenP, and it seems likely that other languages with open-class pronouns such as Burmese and Thai (Panagiotidis 2002:30-33, Cooke 1968) should be similarly analysed.

This brings us onto the agglutinative "plural" markers *-tati* and *-ra*, which seem superficially very like Chinese *-men*, and have indeed been analysed as comparable (e.g. Ishii 2000; Kurafuji 1999,2004). However, Nakanishi and Tomioka (2004) suggest that *-tati* differs from *-men* specifically in its definiteness – while, as we have seen above, *-men* is inherently definite, *-tati* may also occur in indefinite contexts (compare with 39b):

(46) kooen-ni kodomo-tati-ga ita.
     park-LOC child-TATI-NOM existed
     'There were children in the park.'

(Nakanishi and Tomioka 2004:120)

Thus *-tati* (and presumably *-ra*) cannot be in D, and so I take them to be in a lower position.[9] While this may be Num, Nakanishi and Tomioka (2004) demonstrate that *-tati* is otherwise similar to *-men*, retaining the collective interpretation, and so I suppose it to be in Cl.

[9] Ueda and Haraguchi (2008) suggest there are in fact two -tati markers in Japanese, one of which is a regular plural marker, and one of which has a collective denotation, leading to examples such as (i), which is impossible in Chinese (ii):

(i)   gakusei-tati-tati
        student-TATI-TATI
        'the students and their associates'
(ii)   *xuesheng-MEN-MEN
        student-men-men

(Ueda and Haraguchi 2008:237)

We can, therefore, update N&S's analysis of Japanese with the following:

(47)a.

```
        KP
       /  \
     ClP    K
    /   \
   NP    Cl
   |
   N
```
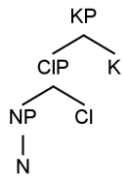
b. [N …] ↔ /watasi/; /anata/; /kare/; …   [K NOM] ↔ /ga/
    [Cl …] ↔ ∅   [K ACC] ↔ /o/
    [Cl COLL] ↔ /tati/; /ra/   [K DAT] ↔ /ni/
                                             [K GEN] ↔ /no/

Thus Japanese pronouns are entirely agglutinative, and inflect for case and classifiers (or perhaps plurality), and so a roll-up structure is assigned and the language is radical pro drop.

3.4.3 Turkish.

The analysis of Turkish given by N&S (p.705) can largely be retained, with pronouns inflecting for person, number, and case. Additionally, in terms of D&W's categories, I take Turkish pronouns to be pro-DPs, as they suggest (D&W:412,fn.5), citing Baggaley (1998). Thus pronouns have the following structure:

(48)a.

```
           KP
          /  \
        DP     K
       /  \
    PersP   D
    /   \
  NumP   Pers
  /  \
NP    Num
|
N
```
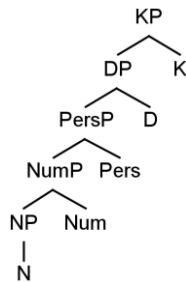
b. [PersP +p, -a, 1, SG] ↔ /ben/   [PersP +p, -a, 1, PL] ↔ /biz/
    [PersP +p, -a, 2, SG] ↔ /sen/   [PersP +p, -a, 1, PL] ↔ /siz/
    [PersP +p, -a, 3, SG] ↔ /o/; /on/   [PersP +p, -a, 3, PL] ↔ /onlar/
    [D …] ↔ ∅   [K NOM] ↔ ∅
    [K ACC] ↔ /i/   [K GEN] ↔ /in/
    [K DAT] ↔ /a/   [K LOC] ↔ /de/
    [K ABL] ↔ /den/

                                                      (data from N&S:705)

The instrumental case attaches only to genitive forms, and so I treat it as a postposition and exclude it from the analysis above. Turkish pronouns, then, are fusional for person and number, and agglutinative for case, leading to radical pro drop and a roll-up structure.

It may, therefore, be that the lower -*tati* is in Num and the higher in D, but this requires further analysis into the availability of D in Japanese and the behaviour of both markers.

3.5 Pronoun internal structure in languages without radical pro drop.
3.5.1 Dutch.

Dutch is one of N&S's canonical examples of a fusional language, having the following paradigm for strong pronouns[10]:

|	NOMINATIVE	ACCUSATIVE	POSSESSIVE
1 SG	ik	mij	mijn
2 SG	jij	jou	jouw
3 SG M	hij	hem	zijn
3 SG F	zij	haar	
3 SG N	het		zijn
1 PL	wij	ons	
2 PL	jullie		
3 PL	zij	hun	

Table 3: Dutch strong pronouns.

(N&S:693)

Thus strong pronouns inflect for person, number, gender, and case, although there is some syncretism in the paradigm. Though some inflection, such as possessive marking, looks potentially agglutinative, N&S (p.706) suggest, following Pinker (1984), that morphological segmentation is driven by a search for shared phonetic material between related forms. Thus when searching for a possessive morpheme, irregular forms such as *haar*, *ons*, and *jullie* prevent *-n* from being identified as a morpheme, and so possessive marking is viewed as fusional, with similarities instead being "family resemblances" (Bybee and Slobin 1982; Pinker and Prince 1988,1994,1996). In lieu of a more detailed theory of morphological acquisition, this seems a reasonable attempt to make, and so we can assume that the Dutch paradigm above is sufficiently irregular to be fusional. Furthermore, following Koppen (2005:112-116), I take Dutch pronouns to be pro-φPs, and so we can assume they have the structure in (49a), with spell-out rules such as those in (49b).

(49)a.
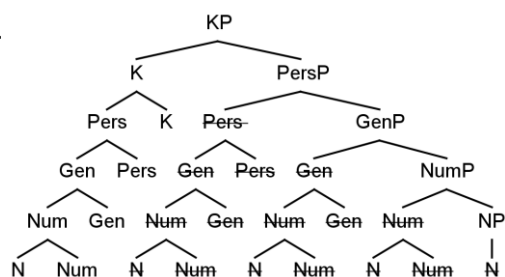
b. [$_{KP}$ +p, -a, 1, SG, NOM] ↔ /ik/
[$_{KP}$ +p, -a, 3, SG, F, NOM] ↔ /zij/
[$_{KP}$ +p, -a, 2, PL] ↔ /jullie/
etc.

---

[10] As N&S (p.693) point out, Dutch also has a weak pronominal paradigm, which "may seem more relevant, given Cardinaletti and Starke's (1999) claim that null subjects fall into the category of weak pronouns." As they note, however, "tonic pronouns are less susceptible to phonological change and therefore are more likely to preserve regularity." Furthermore, given the approach taken, there is no need to identify radical null subjects with weak pronouns, and we will later compare these pronouns to *wh*-elements, where it is apparent that Dutch (and Arabic) *wh*-phrases are more comparable to strong rather than weak pronouns. Thus I focus on the strong pronouns of these languages.

Thus the fusional nature of the pronouns leads to a head movement structure being assigned, and so KP-level spell-out rules are used, blocking radical pro drop.

3.5.2 English.

D&W (pp.421-426) suggest that English personal pronouns do not all fall into the same category, with 1st and 2nd person pronouns being pro-DPs, and 3rd person pronouns being pro-ϕPs. This is based on, among other features[11], the ability of 1st and 2nd person pronouns to function as determiners (50a-b) but not participate in word formation (50b) or act as bound variables (50c), whereas 3rd person pronouns show the opposite of these properties (51):

(50) a. we/you linguists
    b. *me-male, *you-goat
    c. I_i know that John saw <u>me</u>$_i$, and Mary does too.
      = 'I know that John saw me, and Mary knows that John saw me.'
        λx [x knows that John saw me] & λy [y knows that John saw me]
      $\neq$ 'I know that John saw me, and Mary knows that John saw her.'
        λx [x knows that John saw x] & λy [y knows that John saw y]

(51) a. *they linguists
    b. she-male, he-goat
    c. [Every candidate]$_i$ thinks that [he]$_i$ will win.
      = $\forall x$, x thinks that x will win

(D&W:421,423,426)

Roberts (2010:226-226,fn.17) criticises these data, however, showing that 1st and 2nd person pronouns can occur as variables in some contexts (52), and also notes that they can participate in word-formation in cases such as *me-generation* and *fuck-you mentality*.

(52) a. When we're young, we think we know everything.
      = $\forall x$, when x is young, x thinks x knows everything
    b. You (all) think you're really smart, don't you?
      = $\forall x$, x thinks x is smart

(adapted from Roberts 2010:227)

Roberts concludes from this that all English personal pronouns are DPs, but this is because he crucially wants to distinguish them from Romance clitics. It is more consistent with D&Ws approach, however, to suggest that English personal pronouns are all pro-ϕPs (subcategorising an N), with clitics instead being simplex ϕs (D&W:438-439). Thus I suppose that English pronouns can be viewed similarly to Dutch pronouns – they are ϕPs that inflect fusionally for person, number, gender and case, as the following paradigm shows:

---

[11] The other evidence used is based on predicate/argument distinctions, which I argued to be inconclusive in section 3.3.

	NOMINATIVE	ACCUSATIVE	POSSESSIVE
1 SG	I	me	my
2	you		your
3 SG M	he	him	his
3 SG F	she	her	
3 SG N	it		its
1 PL	we	us	our
3 PL	they	them	their

Table 4: English pronominal paradigm.

Thus English has the structure in (53a) (=49a), and spell-out rules such as those in (53b):

(53)a.

b. [$_{KP}$ +p, -a, 1, SG, NOM] ⟷ /I/
[$_{KP}$ +p, -a, 3, SG, F, NOM] ⟷ /she/
[$_{KP}$ +p, -a, 2, PL, POSS] ⟷ /your/
etc.
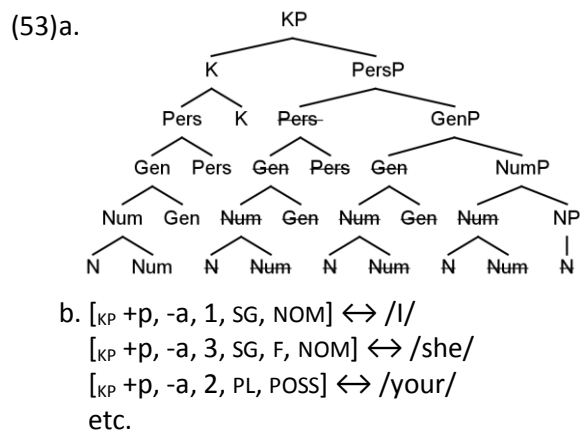
English personal pronouns are therefore assigned a head movement structure, and so radical pro drop cannot occur.

3.5.3 Arabic.

It is by no means only Indo-European languages that exhibit fusional pronouns – Arabic, for instance, has both strong and weak fusional pronouns. The paradigm for strong pronouns in Standard Arabic is given below:

	SINGULAR	DUAL	PLURAL
1	ʔanna	-	naħn-u
2 M	ʔanta	ʔantumaa	ʔanum
2 F	ʔanti	-	ʔantunna
3 M	huwa	humaa	hum
3 F	hiya	-	hunna

Table 5: Arabic strong pronouns.

(Ryding 2005:298-299)

Thus Arabic pronouns do not inflect for case, but do for person, number and gender. As strong pronouns, their use is restricted to emphatic contexts, and so we can hypothesise that they might be pro-DPs. In Lebanese Arabic at least, however, they can act as bound variables in non-resumptive contexts (Aoun, Choueiri, and Hornstein 2001:389):

(54) [kəll muttahame]$_i$ χabbarit l-ʔaaḍe ʔənno [hiyye]$_i$ raħ tərub
    each suspect.SG.F told.3.SG.F the-judge that she FUT ran.away.3.SG.F
    'Each suspect told the judge that she will run away.'
    = ∀x, x told the judge that x will run away

Assuming this carries over to Standard Arabic then, we can assume it to have pro-φPs, with the same structure as in Dutch and English (49a,53a), and spell-out rules such as the following:

(55) [$_{KP}$ +p, -a, 1, SG] ↔ /ʔanna/
    [$_{KP}$ +p, -a, 2, DL, M] ↔ /ʔantumaa/
    [$_{KP}$ +p, -a, 3, PL, F] ↔ /hunna/
    etc.

Unlike Dutch and English, no spell-out rules refer to case, although by assumption KP is still present. Arabic is nonetheless fusional for person, number, and gender, and so pronouns have a head movement structure and do not undergo radical pro drop.

   3.6 Summary: c-selectional ^ as the Borer-Chomskyan trigger of radical pro drop.

The examples above, then, demonstrate the compatability of N&S's approach to radical pro drop with the c-selectionally determined structures postulated to underlie fusion and agglutination, following (Julien 2002). In section 2.4, three dimensions of c-selectional variation were proposed, and it seems that crosslinguistically, pronouns exhibit variation in two of these dimensions. Firstly, as we have seen above, different languages select different fuctional heads – for instance, while English makes use of gender, Japanese does not. Such variation can be identified with changes in the values of c-selectional features, and is inherently microparametric. More interesting, then, is the variation in the c-selectional movement trigger, ^, that we have observed. As discussed in section 3.2, the pronoun-internal distribution of ^ is limited by multiple factors, leaving two key options: ^ on all pronominal heads, or ^ on no pronominal heads, and so the learner need only consider the highest head, K. As noted in (30) the first of these leads to L-movement and the second to head movement, and we have seen above that these structures have consequences for fusion versus agglutination and the availibility of radical pro drop. We can, therefore, update (30) with the following[12]:

(56)

Is ^ associated with the c-selectional features of pronominal K?

Yes	No
consistent L-movement	consistent head movement
agglutinative pronouns	fusional pronouns
(potential) radical pro drop	no radical pro drop
e.g. Chinese, Japanese, Turkish, ...	e.g. Dutch, English, Arabic, ...

Thus the presence of ^ on the c-selectional features of K can be seen as a kind of parameter, complete with binarity and some minimal clustering effects, and furthermore, it is entirely consistent with the BCC, as variation is located on the formal features of K, a functional head. This proposal does not, however, have quite the range of early P&P parameter proposals, and is not quite

---

[12] Languages with ^ are noted as only potentially showing radical pro drop because of N&S's (pp.705-706) suggestion that the zero spell-out rule for KP may not be universal, with languages such as Finnish not having it. See section 3.1.

macroparametric, essentially being a Borer-Chosmkyan restatement of N&S's proposal, which ultimately only has consequences for phonetic realisation. However, this restatement has crucially introduced structural consequences of fusion and agglutination, and while these seem to have no great impact on personal pronouns[13], we shall see in the following section that this structure appears to carry over to *wh*-elements, with a significant syntactic reflex.

4. Agglutinative *Wh*-Morphology as a Trigger of *Wh*-In-situ.

4.1 The internal structure of wh-*elements and the position of the* wh-*morpheme.*

The distinction between L- and head movement assumed above need not only apply to pronouns, and in this section, I consider the potential consequences it may have for *wh*-elements, especially *wh*-pronominals. Before such consequences can be investigated, however, it is necessary to determine at least a broad structure for *wh*-elements, including the functional heads involved, and thus I first consider several suggestions for *wh*-internal structure.
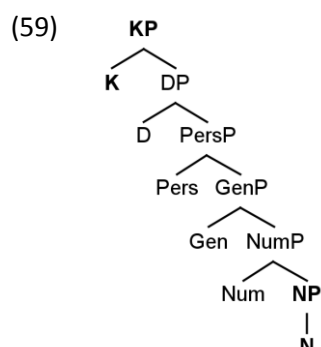
Wh-elements are typically divided into at least an abstract WH morpheme and some other component, with the perhaps the earliest proposals being that of Chomsky (1955:433-434) they can be seen as WH combined with an pronoun, for example:

(57) who = WH + (s)he, what = WH + it, etc.

However, most early transformational analyses viewed *wh*-elements as WH combined with an indefinite, along the following lines (see Katz and Postal 1964:93, Klima 1964:11,fn.6, Kuroda 1965:22,1968):

(58) who = WH + someone, what = WH + something, etc.

Thus *wh*-elements have a long history of being analysed as both pronominal and indefinite in nature, and this is a view that is still held more recently, with Tsai (1994) broadly following both analyses (see p.19,fn.4), and Chomsky (1995:263) supposing wh-phrases involve "an abstract element underlying indefinite pronouns," (see section 4.2 for further discussion). It is therefore not unreasonable to assume that *wh*-phrases differ only minimally from the structures assigned to pronouns in the previous section, with them being based on the structure in (35), repeated below:

(59)

```
            KP
           /  \
          K    DP
              /  \
             D   PersP
                 /   \
              Pers   GenP
                    /   \
                  Gen   NumP
                       /   \
                     Num    NP
                            |
                            N
```

Where, then, should the *wh*-morpheme reside in this structure? Most analyses, including those above, presume WH to be in a hierarchically high position, but one interesting and perhaps

---

[13] It does, however, potentially explain why only radical pro drop languages appear to allow open-class pronouns – such pronouns require head-level spell-out rules to apply to N, and in fusional languages, this is impossible due to the head movement structure.

unexpected consequence of the roll-up and head movement structures assumed thoughout is that we instead predict WH to be low in the structure, as it must ultimately linearly precede both a nominal component as well as any inflectional heads, especially in agglutinative languages where phrase-level spell-out rules need not be involved. This, however, leads to something of a paradox, as WH seems like a very good candidate for a functional morpheme, yet our theory predicts that it should be more lexical than even N.

One potential resolution to this difficulty follows Williams (1981), who proposes N, as well as V, is capable of having an external argument. The identity of this argument is unclear, however – he notes that sentences such as (60) have an internal Actor and an internal Theme, and so the external argument can be neither of these.

   (60) I consider that [_NP destruction of the city by evil forces] …

(Williams 1981:86)

Williams therefore suggests terms the external argument of NPs is "R," with *destruction* in (60) having R as its external argument, and Actor and Theme as its internal arguments. R, then, can be used both predicatively (61a) and referentially (61b), with the following sentences having R as *John* and *x* (i.e. a variable) respectively:

   (61) a. John is a fool.   fool (John)
        b. The fool left.   ∃!x (fool(x) & left(x))

(Williams 1981:86)

While this idea precedes the DP hypothesis of Abney (1987), and so might require considerable modification under a modern approach, the basic idea that NPs have external arguments that determines their reference seems a reasonable one to adopt, even if covert elements are usually in the position of R. Furthermore, this is somewhat different to the concept of a verbal external argument, with Williams (1981:86) noting that "the external argument of … a [predicative] noun has no counterpart in the verbal system," and so I suppose that a separate projection is present for R directly above the NP, which I term RP,[14] and I further take there to be a light noun phrase (nP) which is itself above RP. Thus nouns are postulated to have the following fine structure:

   (62)   nP
              / \
            n   RP
                 / \
               R   NP
                     |
                     N
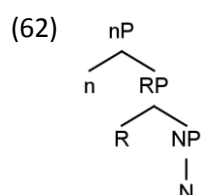
We are now in a position to address the location of the WH morpheme. We have already seen in (61b) that R may be a variable, presumably with a null morpheme, but in the case of *wh*-elements, I suppose that it is not R but N that is null, with *wh* being the realisation of R, and the overt nominal component of the *wh*-element being n. Thus the configuration in (63) is able to act as a variable,

---

[14] See Roberts (forthcoming) for a similar approach to nominal reference, but with R merged in Spec,nP. Nevertheless, as will become clear in the following analysis, it is necessary for R to be the head of its own projection below nP. The validity of this approach rests largely on a more detailed theory of nominal arguments, although it is supported both by R being a fairly unique property of nouns, and by the empirical surveys below.

being treated as an indefinite (Heim 1982), and so the indefinite pronominal nature of *wh*-phrases is explained. Furthermore, given the copy theory of movement, a copy of (63) will always remain in-situ, and so its variable nature is explained without the need for operations such as Trace Conversion (Fox 2002:67-68).

(63)

```
        RP
       ╱╲
      R   NP
      |    |
      wh   N
           |
           ∅
```
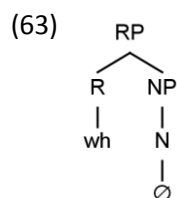
Furthermore, this view of *wh*-elements resolves the ordering paradox above, as WH is the lowest overt element in the structure, and so should occur word-intially. And WH is by no means the only overt morpheme that occurs in R – for instance, if we treat TH as a demonstrative (rather than indefinite) R, then the parallel between demonstratives and wh-expressions is explained:

wh-words	demonstratives
wh-o	th-ey
wh-om	th-em
wh-at	th-at
wh-en	th-en
wh-ere	th-ere

Table 6: English wh-*words compared to demonstratives.*

The above table is adapted from Tsai (1994:19), who states that "it is not difficult to see that English *wh*-words and [demonstrative] pronominals are more or less built on the same materials except that the prefix for pronominals is *th-* instead of *wh-*." This is equally true of other languages such as Japanese, where the agglutination makes the parallels even clearer:

wh-words		demonstratives	
do-re	'which one'	ko-re	'this one'
do-no	'which'	ko-no	'this'
do-ko	'where'	ko-ko	'here'
do-o	'how'	ko-o	'this manner'

Table 7: Japanese wh-*words compared to demonstratives.*

(Hirose 2003:500)

This gives further evidence for an overt R system, and we can therefore tentatively conclude that the WH morpheme is an overt realisation of a functional head between nP and a null NP, leading to an indefinite interpretation. Before applying this theory of *wh*-structure to specific languages, however, I first consider one further aspect of structure, the operator morpheme, which turns out to have significant consequences for the analysis of *wh*-in-situ when considered alongside fusion and agglutination.

4.2 The operator morpheme and wh-*in-situ.*

So far, then, we have understood the indefiniteness of *wh*-phrases to be a direct result of the WH morpheme, but their operator nature has yet to be considered. As variables, *wh*-phrases or their

copies must be bound by question operators in CP, with *wh*-movement being driven by e.g.feature checking (Chomsky 1995) or edge features (Chomsky 2008):

(64) What did you buy John ~~what~~?
       Op$_{[Q]x}$, you bought John x

While viewing *wh*-phrases as operators neatly explain *wh*-movement languages, it is more problematic for languages such as Japanese, where *wh*-elements remain in-situ:

(65) John-ga nani-o shiteru?
       John-NOM what-ACC doing
       'What's John doing?'

Wh-in-situ languages have been analysed from a number of perspectives (see e.g. Pesetsky 1987, Cheng 1991, Hagstrom 1998, Reinhart 1998), but I largely follow the approach of Watanabe (1992a), who proposes that Japanese *wh*-phrases contain a null operator that moves to Spec,CP, on the basis of (among many others) cases such as (66):

(66) a. ??John-wa [Mary-ga nani-o katta kadooka] Tom-ni tazuneta no?
          John-TOP Mary-NOM what-ACC bought whether Tom-DAT asked Q
          ??'What did John ask Tom whether Mary bought?'
       b. John-wa [Mary-ga nani-o katta kadooka] dare-ni tazuneta no?
          John-TOP Mary-NOM what-ACC bought whether who-DAT asked Q
          'Who did John ask whether Mary bought what?

(Watanabe 1992a:263)

While there is an apparent island effect in (66a), the presence of an additional *wh*-element outside the island, *dare*, appears to rescue (66b), which parallels the English translations despite the lack overt movement. Thus Watanabe suggests Japanese, like English, is subject to subjacency, with the effect arising from syntactic movement of a null operator, in contrast to earlier approaches with *wh*-in-situ arising from LF-movement (e.g. Lasnik and Saito 1984). Thus Watanabe (1992a:264) gives the following structure for Japanese wh-phrases following movement (he assumes Japanese to have "Spec of CP to the right"):

(67) [$_{CP}$ [$_{IP}$ … *wh*-phrase$_i$ …][$_C$ *ka*] Op$_i$]

There are two major ways to generalise this approach crosslinguistically (see Chung 2000 for a detailed comparison of these approaches). The first is implicit in Chomsky (1995:263), who supposes that in English "the words *who*, *what* have three components: the *wh*-feature, an abstract element underlying indefinite pronouns, and the feature [± human]," with the *wh*-feature moving to check a strong interrogative feature on C, pied-piping the rest of the phrase to prevent a crash at PF. By contrast, he suggests that following Watanabe (1992a), there may be "overt raising of empty operators in Japanese," (Chomsky 1995:264). Essentially then, Op is equated with the WH morpheme, being a phonetically realised feature in English, and an empty operator in Japanese. Tsai (1994), however, suggests that Op is distinct from the WH morpheme, instead deriving crosslinguistic differences from the position of Op in that language:

(68) a. Japanese-type: $[_{CP}$ Op$_{[Q]x}$ $[_{IP}$ ... $[_{PP/DP}$ t$_x$ [... wh(x) ...]]...]]
     b. English-type: $[_{CP}$ $[_{PP/DP}$ wh(x)-Op$_{[Q]x}]_k$ $][_{IP}$ ... t$_k$ ...]]

(Tsai 1994:53)

Leaving aside the complexities of this analysis[15], the key difference between English and Japanese is the position of Op – in Japanese, it is in Spec,DP/PP, and so is free to move independently of the *wh*-element, whereas in English it forms a morphological unit with the *wh*-element, thus forcing the *wh*-phrase to move along with the operator.

Following the structural approach to fusion/agglutination that we have been assuming so far, however, it is possible to adapt Tsai's approach, keeping Op in the same initial position in both languages, but with word-internal movements altering *wh*-behaviour. First, it is necessary to determine a position for Op, and I will assume (perhaps controversially, but see footnote 16) that it is the internal argument of the null NP we argued for above. Thus interrogative *wh*-phrases have the following structure prior to movement:

(69)

```
          KP
         /  \
        K    ...
              \
              RP
             /  \
            R    NP
            |    /  \
           wh   N   OpP
                |    |
                ∅    Op
```
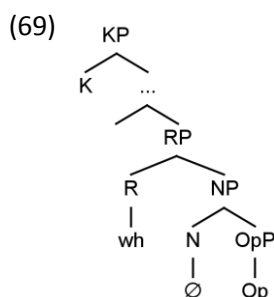
This structure then either undergoes L-movement or head movement, depending on whether ^ is associated with the c-selectional features of K. Omitting intermediate structure, then, we have the following possibilities:

---

[15] Tsai (1994) follows Watanabe (1992b) in suggesting that Op is generated in Spec,DP – this is to derive the fact that Japanese appears not to exhibit complex NP constraints in many cases:

(i)   Mary-wa [John-ni nani-o ageta hito]-ni atta no?
        Mary-TOP John-DAT what-ACC gave person-DAT met Q
        *'What did Mary meet the man who gave to John?'

(adapted from Pesetsky 1987:113)

Thus for complex *wh*-phrases, Op is said to originate in the Spec of the complex DP, rather than the *wh*-DP, and is thus outside the island. This proposal thus contrasts with the earlier suggestion that such complex DPs undergo large-scale pied-piping at LF (Pesetsky 1987). The Spec,DP approach, however does not clearly explain evidence such as the emergence of the complex NP effect when the element *ittai* is added:

(ii)   *Mary-wa [John-ni ittai nani-o ageta hito]-ni atta no?
         Mary-TOP [John-DAT the-hell what-ACC gave person-DAT met Q
         *'What the hell did Mary meet the man who gave to John?'

(adapted from Pesetsky 1987:112)

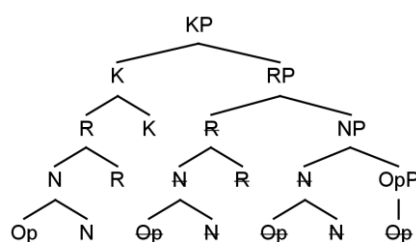Furthermore it is unclear why Op should be associated with a non-interrogative DP. For simplicity, I thus leave aside further considerations of complex NP islands in my approach, but it is possible that they could be explained as a microparametric option.

(70)a.
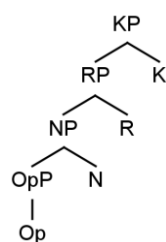
agglutinative

b.

fusional

Assuming L-movement does not have a freezing effect, in the agglutinative case OpP is free to move to Spec,CP, leaving the *wh*-phrase in-situ, but in the fusional case, the entire complex head is targeted, leading to movement of KP to Spec,CP and initial *wh*-phrases.[16] Thus a very clear prediction is made – that *wh*-in-situ should pattern with agglutinative *wh*-morphology. I now reinvestigate the languages considered in section 3 from this perspective to assess the accuracy of this hypothesis.

4.3 The structure of wh-*phrases in specific languages.*

Unlike pronouns, whose structures could clearly be determined by D&W's criteria such as binding properties, *wh*-phrases are more difficult to analyse, as their function depends on their ability to act as bound variables, and so this appears to be a universal property they hold. Instead, then, following the view of *wh*-structure outlined in section 4.1, I compare the structures of pronominal *wh*-phrases to the structures proposed for pronouns in sections 3.4 and 3.5, relying largely on inflectional criteria, and assessing each language in terms of agglutination and presence of *wh*-in-situ, following the above hypothesis. I assume adnominal and adverbial *wh*-phrases have similar structures, but do not consider the differences here, and focus on non-adnominal pronominals.[17]

4.3.1 Mandarin Chinese.

Mandarin is a clear example of a *wh*-in-situ language:

  (71)a. Zhangsan kanjian-le shei?
        Zhangsan see-LE who
        'Who did Zhangsan see?'
      b. ta xihuan shenme?
        he like what
        'What does he like?'

(Huang, Li, and Li 2009:260)

The prediction, then, is that Chinese *wh*-phrases should be agglutinative. In section 3.4.1, it was demonstrated that Chinese personal pronouns use the agglutinative markers *-de* and *-men*, assumed

---

[16] Crucially, Op must be low in the structure to prevent movement of any other shells of the *wh*-phrase in the agglutinative case. While one might suppose that head-to-Spec movement could be assumed instead, this is problematic for the fusional case as we assumed in section 3 that complex heads must spell out phrasally, and so here movement of the entire KP is required. Thus the low position of Op follows directly from theoretical assumptions, but is not necessarily so unsupported empirically. Tsai (1994:20-21) supposes *some* in *somewhat, somewhere* etc. is an overt manifestation of another operator, and following the same argument as for the low position of the WH morpheme in section 4.1, we can assume *some* to originate in a low position.
[17] While *whose* and its Dutch equivalent are briefly mentioned below, I do not consider *which*. It may be possible that such *wh*-phrases subcategorise nominals which are in separate extended projections, but such considerations are beyond the scope of this thesis.

to be realisations of K and D respectively. As *wh*-phrases are inherently indefinite, we predict them to be unable to take *-men*, which is indeed the case:

(72) a. *shenme-men
        what-MEN
    b. *shei-men

(Biggs p.c.)

This therefore gives further evidence for *-men* being in D, while also making it difficult to determine whether D is present at all in Chinese *wh*-phrases – I take it to be present but obligatorily null. Furthermore, this sheds no light on the agglutinativity of *wh*-phrases, but K is more informative, with *shei* being able to inflect for genitive case:

(73) shei-de
     who-GEN
     'whose'

(Biggs p.c.)

Thus we have sufficient evidence to conclude that Chinese *wh*-phrases undergo L-movement, and so this is consistent with the above *wh*-in-situ hypothesis. What remains then, is for the remainder of the *wh*-structure to be worked out, which appears to be phonologically fusional.

Chinese *wh*-phrases show no person distinctions, which I take to be a consequence of *wh*-phrases being obligatorily 3rd person (if specified at all), which both parallels demonstratives, which were assumed to have related structures in section 4.1, and also seems to hold crosslinguistically, as we shall see below. Thus the structure of Chinese *wh*-pronominals appears to be consistent with the structure proposed in section 3.4.1 for Chinese pronouns, and so we can represent them as in (74), with the differences between (for example) *shenme* and *shei* resulting from different light nouns being used.

(74) a.
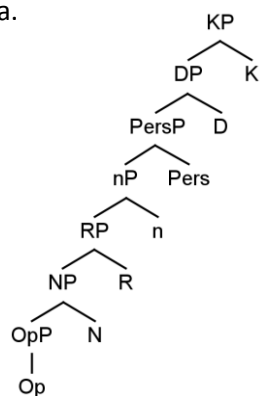
b. [$_{PersP}$ +p, -a, +int, THING, WH] $\leftrightarrow$ /shenme/   [$_K$ …] $\leftrightarrow$ Ø
   [$_{PersP}$ +p, -a, +int, PERSON, WH] $\leftrightarrow$ /shei/   [$_K$ GEN] $\leftrightarrow$ /de/
   [$_{PersP}$ +p, -a, +int, PLACE, WH] $\leftrightarrow$ /nar/   [$_D$ …] $\leftrightarrow$ Ø
   etc.

Thus Chinese *wh*-phrases are fusional below person, and agglutinative for K and possibly (null) D. Thus they undergo L-movement, which is consistent with the language being *wh*-in-situ.

4.3.2 Japanese.

As we saw in (65), Japanese is also a *wh*-in-situ language, and so is predicted to have agglutinative *wh*-phrases. In section 3.4.2, this was demonstrated to be true of its pronouns, which were assigned the following structure (repeated from 47a):

(75)

```
        KP
       /  \
     ClP    K
    /  \
  NP    Cl
  |
  N
```
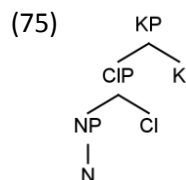
The *wh*-in-situ nature of Japanese leads the prediction that *wh*-phrases should also be agglutinative for K and the collective classifier *-tati*. The first of these is clearly true, with pronominal *wh*-phrases inflecting for case like pronouns (and indeed nouns):

(76) a. Ø nani-o suru no?
        what-ACC do Q
        'What are you doing?'
     b. dare-ga kimasu ka?
        who-NOM come.POLITE Q
        'Who's coming?'

The marker *-tati* is less clear, however. Its usage is restricted to [+human] nominals (Martin 1975), so we should expect it to be incompatible with phrases such as *nani* ('what'), but compatible with *dare* ('who'). Two native speakers I consulted, however, rejected *dare-tati*, but it may be marginal or acceptable for some speakers, appearing in apparently native examples online.[18] Furthermore, if we follow the hypothesis of Ueda and Haraguchi (2008, see footnote 9 above) that there are two *-tati* markers, it may be that this is confusing judgements. Furthermore, Nakanishi and Tomioka (2004:121) note that *-tati* is possible with nouns preceded by *wh*-elements, citing the following example:

(77) Donna gakusei-tati-ga kita no?
     what.kind.of student-TATI-NOM came Q
     'What kind of student came?'

Thus *-tati* contrasts with Chinese *-men* once again in this context, and I tentatively suggest that Japanese *wh*-phrases, as well as pronouns, are agglutinative for *-tati*, although there may be complications (including dialectal variation).

This leaves us with the internal structure of the *wh*-elements themselves. Table 7 shows that the Japanese WH morpheme is often realised as *do-*, as in cases such as *dore* ('which one'), *doko* ('which place'), and so on. For these cases then, we can presume the structure in (78):

---

[18] For example, (i) is taken from <http://twitter.com/#!/hototogisu201/status/76165075349684224>, last accessed 21/06/11:

(i)   dare-tati-ga hatugen suisen site-kita no
        who-TATI-NOM nuclear.power promotion do-came Q
        'Who's been promoting nuclear power?'

(78)a.

```
                        KP
                      /    \
                   CIP      K
                  /   \
               nP      Cl
              /  \
           RP     n
          /  \
        NP    R
       /  \
     OpP    N
      |
      Op
```
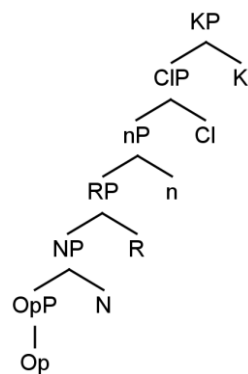
b. [N …] ↔ Ø   [k NOM] ↔ /ga/
   [Cl …] ↔ Ø   [k ACC] ↔ /o/
   [Cl COLL] ↔ /tati/   [k DAT] ↔ /ni/
   [R WH] ↔ /do/   [k GEN] ↔ /no/
   [n THING] ↔ /re/   [n PLACE] ↔ /ko/
   [n MANNER] ↔ /o/   [n PERSON] ↔ /yatsu/
   etc.

This extreme agglutinativity explains the partially open-class nature of Japanese *wh*-phrases – although N must be null, and so they are not fully open-class like pronouns, many light nouns may occur in n and be spelt out at the head-level, leading to morphologically transparent forms such as *do-yatsu* ('who'), which is WH + a generic noun for 'guy,' which may have undergone partial grammaticalisation (see Roberts and Roussou 2003:147-148 for an analysis of the French functional element *personne*, which may have a comparable history). The spell-out rules in (78b) do not, however, explain less transparent forms such as *dare* and *nani*. While it may be possible to analyse *d-/da* and *n-/na-* as allomorphs of *do-* (see Hoji 1995 for the historical relatedness of *d-* and *n-*), I suggest such *wh*-forms are better viewed as phrasal realisations of nP, given the non-transparent light nouns in these case. For instance, *-are* and *-re* respectively mean 'over there' and 'thing,' and so it is unclear how these should underlie *dare*, meaning 'who' rather than 'what' or 'where'. Thus I analyse these forms with the following spell-out rules:

(79)[nP +p, -a, PERSON, WH] ↔ /dare/   [nP +p, -a, THING, WH] ↔ /nani/

Japanese *wh*-phrases are thus agglutinative for K, and in some cases Cl, n, and R. This is consistent with L-movement and the language being *wh*-in-situ.

4.3.3 Turkish.

Turkish is also a *wh*-in-situ language:

(80)a. bugün ne-yi oku-yacak-sın?
       today what-ACC read-2.SG
       'What will you read today?'
   b. parti-ye öğrenci-ler-den kim gel-di?
       party-DAT student-PL-ABL who come-PAST
       'Who among the students came to the party?'

(Kornfilt 1997:317)

We saw in section 3.4.3 that Turkish pronouns inflect for person and number and case. Excluding person, as we did for Chinese, the same seems to be true of Turkish wh-phrases – Kornfilt (1997:316) notes that kim ('who'), ne ('what') and nere ('where') may all inflect for case and plurality, giving the following paradigm for ne:

	SINGULAR	PLURAL
NOMINATIVE	ne	ne-ler
ACCUSATIVE	ne(-yi)	ne-ler(-i)
GENITIVE	ne-yin	ne-ler-in
DATIVE	ne-ye	ne-ler-e
LOCATIVE	ne-de	ne-ler-de
ABLATIVE	ne-den	ne-ler-den

Table 8: Turkish paradigm for ne*, 'where'.*

Thus one difference between Turkish pronouns and Turkish *wh*-phrases is that number is expressed agglutinatively, rather than fusionally. This is not a problem for our analysis, however, as we can postulate the rules in (81b), with *wh*-phrases still being *structurally* comparable to pronouns (81a):

(81)a.
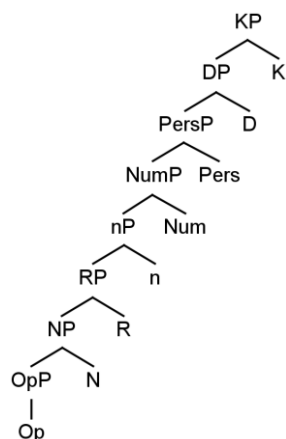
b. $[_{nP}$ +p, -a, +int, PERSON] $\leftrightarrow$ /kim/ $[_{nP}$ +p, -a, +int, THING] $\leftrightarrow$ /ne/
   $[_{nP}$ +p, -a, +int, PLACE] $\leftrightarrow$ /nere/ $[_{Num}$ SG] $\leftrightarrow$ $\emptyset$
   $[_{Num}$ PL] $\leftrightarrow$ /ler/ $[_{D}$ ...] $\leftrightarrow$ $\emptyset$
   $[_{K}$ NOM] $\leftrightarrow$ $\emptyset$ $[_{K}$ ACC] $\leftrightarrow$ /i/; /yi/; $\emptyset$
   $[_{K}$ GEN] $\leftrightarrow$ /in/; /yin/ $[_{K}$ DAT] $\leftrightarrow$ /e/; /ye/[19]
   $[_{K}$ LOC] $\leftrightarrow$ /de/ $[_{K}$ ABL] $\leftrightarrow$ /den/
   etc.

Thus while spell-out rules apply at slightly different levels in pronouns and *wh*-phrases, the underlying structure is still the same, with *wh*-phrases being agglutinative for number and case, and thus having a roll-up structure, which is consistent with them being *wh*-in-situ.

4.3.4 Dutch.

Thus far, we have been considering agglutinative languages, and so we have expected them to be *wh*-in-situ. Dutch, however, is the first fusional language to be considered, and as expected, shows *wh*-movement:

---

[19] This form differs from the pronominal ablative due to vowel harmony.

(82)a. Wat heb je gedaan?
    what have you done
    'What have you done?'
  b. Van wie heb je die schaar gekregen?
    from who have you those scissors got
    'Who(m) did you get those scissors from?'

(Donaldson 1981:72-73)

In section 3.5.1, we assumed that Dutch pronouns were pro-φPs, inflecting for case, person, number and gender. Aside from the expected lack of person inflection, however, Dutch pronouns do not exhibit nearly as much inflection, with both *wie* ('who') and *wat* ('what') showing no inflection whatsoever (Donaldson 1981:72-73) Given Dutch pronouns express gender, it is possible to view them as gendered and ungendered cases of the same *wh*-phrase, which may additionally explain why pronouns such as *waneer* ('when') are adverbial rather than pronominal. Furthermore, the possessive *wiens* ('whose') may be viewed as an inflection for possessive case, and in some forms of the language, this *wh*-phrase also inflects for number and gender (Donaldson 1981:72). Thus we may view Dutch *wh*-phrases as having the following structure (omitting traces):

(83)a.
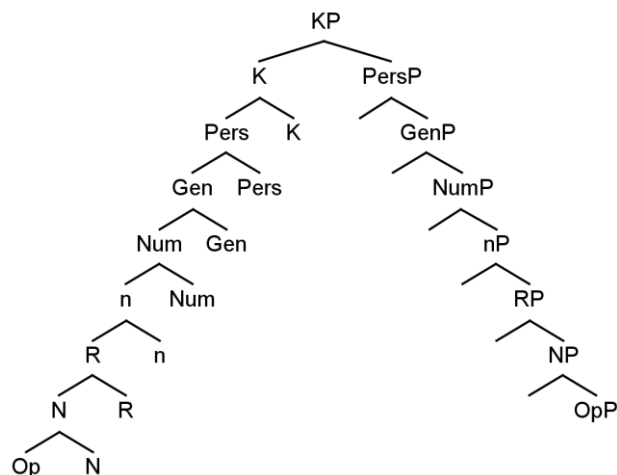
   b. [$_{KP}$ +p, -a, +int, M/F] ↔ /wie/   [$_{KP}$ +p, -a, +int, N] ↔ /wat/
    [$_{KP}$ +p, -a, +int, POSS, M] ↔ /wiens/[20] [$_{KP}$ +p, -a, +int, POSS, F] ↔ /wie d'r/
    [$_{KP}$ +p, -a, +int, POSS, F/PL] ↔ /wier/
    etc.

Thus Dutch has entirely fusional *wh*-phrases derived by head movement, and *wh*-movement as predicted, inflecting minimally for gender, case, and number.

4.3.5 English.

English is similar to Dutch, also having fusional pronouns and *wh*-movement:

(84)a. What did you do?
   b. Who did you meet?

---

[20] Donaldson (1981:72) notes *wie d'r* is spoken, but *wier* is only written. *Wier* may not, therefore, be a true case of inflection.

Unsurprisingly given the close relation to Dutch, its *wh*-words are similar, but show more inflection for case, with *who* having both a nominative (*who*) as well as an accusative (*whom*) form. While the -*m* of *whom* appears superficially agglutinative, it does not occur agglutinatively elsewhere in the language, and is presumably related to distinctions such as *he*/*him*, which are clearly fusional. This is similarly the case for the possessive *whose*, with -*se* being analysed with as related to forms such as *his*, or as a clitic – in either case, no agglutinative inflection is involved. Unlike Dutch, however, *whose* does not inflect for gender, and there is no number inflection whatsoever on *wh*-phrases. Taking *whose* to be possessive, we can give English *wh*-pronominals the following spell-out rules:

(85) $[_{KP}$ +p, -a, +int, M/F$] \leftrightarrow$ /who/ $[_{KP}$ +p, -a, +int, ACC, M/F$] \leftrightarrow$ /whom/[21]
$[_{KP}$ +p, -a, +int, N$] \leftrightarrow$ /what/ $[_{KP}$ +p, -a, +int, POSS, M/F$] \leftrightarrow$ /whose/
etc.

It is unclear then, whether Num is present in the English *wh*-structure, but aside from this, we can presume it to have a structure much like (83a). English *wh*-phrases, then, are fusional for case and perhaps gender, have head movement structures, and undergo movement as predicted.

4.3.6 Arabic.

In section 3.5.3, Arabic pronouns were analysed as pro-φPs, inflecting for person, number, and gender. However, Arabic *wh*-phrases do not obviously inflect at all (Aoun, Benmamoun, and Choueiri 2010:ch.6), and I presume *man* ('who') and *maaðaa* ('what') not to be related by gender as personal pronouns do not inflect for neuter, leading to the following simple spell-out rules for Standard Arabic:

(86) $[_{KP}$ +p, -a, +int, PERSON$] \leftrightarrow$ /man/ $[_{KP}$ +p, -a, +int, THING$] \leftrightarrow$ /maaðaa/
etc.

Leaving aside the unexpected lack of number and gender inflection, it is likely that, following pronouns, *wh*-phrases have a head movement structure. We have yet to consider *wh*-movement, however, which is present, as expected, in Standard Arabic:

(87) a. man zaarat naadia?
who visted.3.F.SG Nadia
'Who visited Nadia?'
b. maaðaa ʔištarat laila fi-l-maktabati
what book bought.3.F.SG Laila in-the-bookstore
'What did Laila buy at the bookstore?'

(Aoun et al. 2010:132)

Aoun et al. (2010:130,159) further note that *wh*-in-situ is impossible in Standard Arabic. However, it is nevertheless possible in other dialects of Arabic. For instance, Lebanese Arabic allows *wh*-in-situ in certain restricted contexts, and with nominal *wh*-elements only (Aoun et al. 2010:154-156), e.g. (88). Furthermore, in Egyptian Arabic *wh*-in-situ is both unrestricted and the default strategy (89a), with some native speakers rejecting gapped *wh*-movement structures as translations from standard Arabic (Aoun et al. 2010:157-158), e.g. (89b):

---

[21] This rule is only available in higher registers of modern English.

(88) ħkiito maʕ miin l-yom?
    talked.2.PL with who the-day
    'You talked with whom today?'

(Aoun et al. 2010:154)

(89) a. mona nisit tiktib ʔeh?
       Mona forgot. 3.F.SG write.3.F.SG what
       'What did Mona forget to write?'
    b. feen itmannit mona tisaafir
       where hoped.3.F.SG Mona travel.3.F.SG

(Aoun et al. 2010:154, citing Wahba 1984)

In addition to this, Cheng (1991:ch.3) argues cases of apparent *wh*-fronting in Egyptian Arabic are in fact clefts rather than true *wh*-movement, with the language being consistently *wh*-in-situ. Such cases are therefore very problematic for the above proposal linking fusional morphology to *wh*-movement, given neither the pronouns nor the *wh*-phrases of these dialects differ significantly from Standard Arabic, being fusional and lacking inflection in all cases (though see Ouhalla 1996 for a discussion of Iraqi Arabic, which allows *wh*-in-situ and may inflect), yet radically different *wh*-behaviour is displayed. In the following section, we shall see that such cases are by no means confined to Arabic, leading to a necessary weakening of the *wh*-in-situ proposal.

4.4 Refinement of the wh-*in-situ prediction.*

Fusional *wh*-in-situ, then, is not merely specific to certain dialects of Arabic, with for instance Igbo being apparently optionally *wh*-in-situ (90), despite having fusional pronouns (table 9) and uninflecting *wh*-phrases:

(90) a. ì mè-rè gịnị̄
        you do-past what
        'What did you do?'
     b. gịnị̄ kà i mè-rè
        what that you do
        'What did you do?'

(Uwalaka 1991:186)

	SINGULAR	PLURAL
1	m(ụ)	ànyị
2	gị	unù
3	ya	ha

Table 9: Igbo independent pronouns.

(Eze 1995:60)

While there is some debate over the correct analysis of the fronted *wh*-elements, with Goldsmith (1981) arguing they are based on relatives, and so not true *wh*-movement, and Uwalaka (1991) suggesting they are true instances of movement. What is clear, however, is that the existence of examples such as (90a) means that *wh*-in-situ is at least an option, with Uwalaka (1991:207) suggesting movement is "optional in direct questions," noting that the two options are pragmatically different, *contra* Goldsmith. When coupled with Cheng's (1991:ch.3) analysis of Egyptian Arabic as *wh*-in-situ, noted above, it seems that we are forced to conclude that some fusional languages can

exhibit *wh*-in-situ, with other possible cases being Persian (depending on the status of the suffix *-ra*, see e.g. Karimi 1990, and Karimi and Taleghani 2007 for a recent analysis of *wh*-behaviour), and perhaps even French (Riemsdijk and Williams 1987:65, though see Munaro, Poletto and Pollock 2003). While none of these languages are canonical cases of *wh*-in-situ, it nonetheless seems necessary to reject the above claim that wh-in-situ occurs if and only if there is agglutinative *wh*-morphology. As we will see below, however, a weaker version of this proposal remains viable.

If fusional languages are able to be *wh*-in-situ, one question that arises is the mechanism that allows this to occur. A vast number of proposals have been made for *wh*-in-situ that do not make use of syntactic movement of an operator to Spec,CP, however, such as covert movement of *wh*-elements at LF (e.g. Huang 1982, Lasnik and Saito 1984, Nishigauchi 1986), unselective binding of some *wh*-elements by a morpheme in Spec,CP (e.g. Pesetsky 1987, Aoun and Li 1993, and arguably originating with Baker 1970), or more recently, use of a Choice function (Reinhart 1998) – see Cheng (2009) for a contemporary review of approaches. We can conclude, therefore, that one or perhaps many of these options are available to languages with fusional *wh*-elements, leading to the cases discussed above. If this is correct, we should expect these options to also be available for agglutinative *wh*-in-situ languages, leading to in-situ *wh*-phrases without null operator movement, and this does indeed appear to be the case.

The original evidence for null operator movement, following Watanabe (1992b), was the existence of island effects for in-situ *wh*-elements, as seen for Japanese in (66) above. Chinese argument *wh*-phrases, however, exhibit no such effects, with (91) allowing both readings given:

(91) ni xiang-zhidao [shei mai-le shenme]?
    you want-know who buy-LE what
    'Who is the person x such that you wonder what x bought?'
    'What is the thing x such that you wonder who x bought?'

(Huang 1982:267)

This lack of island effects has been approached from various perspectives, with for instance Nishigauchi (1986) and Firengo, Huang, Lasnik and Reinhart (1988) supposing that pied-piping takes place at LF, and Aoun and Li (1993) suggesting unselective binding occurs. Tsai (1994:53) supposes Chinese operators originate in Spec,CP, and so no operator movement is necessary (compare with Japanese and English in (68)):

(92) [$_{CP}$ Op$_{[Q]x}$ [$_{IP}$ … wh(x) …]]

(Tsai 1994:53)

The correct approach does not bear strongly on our analysis – what is important, however, is that both fusional and agglutinative *wh*-elements may feasibly remain in-situ by a number of mechanisms other than operator movement. Let us suppose, then, that there are a variety of strategies available for *wh*-questions, only one of which is movement of a word-internal operator. In languages with fusional *wh*-phrases, it is precisely this strategy that leads to overt phonological movement of the entire *wh*-element, as proposed in section 4.2. Crucially, in languages with agglutinative *wh*-phrases, this movement is impossible as the operator morpheme does not enter into a complex head and so moves alone, meaning true *wh*-movement can never occur, whatever *wh*-strategy is employed. We arrive, therefore, at the following generalisation:

(93) Languages with agglutinative *wh*-phrases must always be *wh*-in-situ.

This weakening of the prediction in section 4.2 therefore leads to a generalisation that fits the data examined thus far, while allowing for parametric variation in the mechanisms underlying *wh*-in-situ. We are now in a position to return to considerations of *wh*-structure, and the consequences it has for Borer-Chomskyan macroparameters.

4.5 Wh-*structure, pronominal structure, and a potential macroparameter.*

In sections 4.1 and 4.3, it was largely assumed that *wh*-pronominals have very similar structures to pronouns, a proposal which appeared to work empirically for the cases examined. It is now possible to examine these cases together, to determine the validity of this hypothesis. Thus in table 10, the structures of *wh*-pronominals, as examined in section 4.3, are compared to the results of the examination of pronouns in sections 3.4 and 3.5, both in terms of the categories that are overtly realised, and whether the structures are formed by L-movement or head movement. Categories that inflect more minimally in the *wh*-domain than the pronominal domain are placed in brackets.

	pronouns		*wh*-pronominals	
	inflect for	L-movement?	inflect for	L-movement?
Chinese	K, D, Pers	yes	K	yes
Japanese	K, Cl	yes	K, Cl	yes
Turkish	K, Pers, Num	yes	K, Num	yes
Dutch	K, Pers, Gen, Num	no	K, (Gen), (Num)	no
English	K, Pers, Gen, Num	no	K, (Gen)	no
Arabic	Pers, Gen, Num	no	-	no

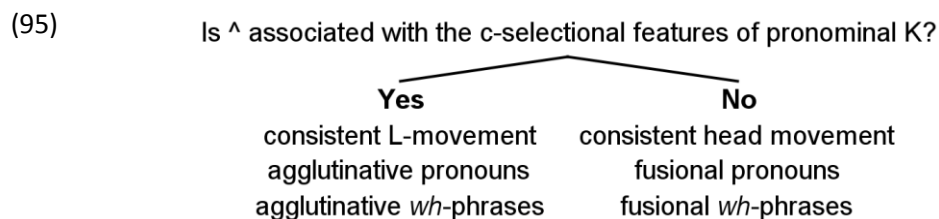*Table 10: Inflectional properties of pronouns and* wh-*pronominals.*

We can make two key generalisations about the above data:

(94) a. *Wh*-pronominals inflect for a subset of the categories that pronouns inflect for.
 b. If pronouns are syntactically agglutinative, then so are *wh*-pronominals, and vice versa.

Both of these seem to back up the hypothesis that *wh*-phrases and pronouns are similar in structure. Firstly, (94a) is to be expected if *wh*-phrases have the same structure as pronouns, but are unable to realise the categories D (as they are inherently indefinite), and Pers (as they are inherently 3rd person). While these categories do always seem to be lacking in the *wh*-domain, in some of the fusional examples, gender and number are also unexpectedly absent. If we presume this is due to a functional pressure,[22] it is still possible to maintain the hypothesis that *wh*-phrases and pronouns have essentially the same intralinguistic structure, differing only in the presence or absence of a *wh*-operator, with microparametric differences in c-selectional features underlying crosslinguistic variation in this structure. This is further verified by (94b), which suggests that *wh*-phrases and pronouns are similar not only in c-selectional features themselves, but also in terms of c-selectional movement triggers, a fact that will be important below.

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[22] It is not necessary for fusional languages to realise Num and Gen only minimally in the *wh*-domain, with for instance Latin inflecting fairly fully for K, Gen, and Num (although masculine is not distinguished from feminine in the singular). As predicted, D and Pers inflection are both absent. (Gildersleeve and Lodge 1997)

Thus on the basis of this preliminary evidence, I suggest that the structure of *wh*-phrases is based on that of pronouns, with the acquirer first determining the structure of pronouns, then applying this to *wh*-pronominals and other *wh*-phrases. One important consequence of this hypothesis is that c-selectional movement triggers are assigned identically in the *wh*-domain and the pronominal domain; in terms of the approach followed above, where only the highest head needs to be examined, we can say that [+p, -a] Ks are assigned ^ together with [+p, -a, +int] Ks. If we term all such Ks as pronominal, then it follows that the assignment of ^ to pronominal K determines both pronoun structure and *wh*-structure, as shown in (95):

(95)   Is ^ associated with the c-selectional features of pronominal K?

Yes	No
consistent L-movement	consistent head movement
agglutinative pronouns	fusional pronouns
agglutinative *wh*-phrases	fusional *wh*-phrases

We have already seen in section 3 that such structural differences have phonological consequences for pronouns, and in this section, we have proposed that in the case of *wh*-phrases, these structural differences underlie the distinction between *wh*-movement and *wh*-in-situ, as summarised above. We are now able to connect these properties together:[23]

(96)   Is ^ associated with the c-selectional features of pronominal K?

Yes	No
consistent L-movement	consistent head movement
agglutinative pronouns	fusional pronouns
(potential) radical pro drop	non-radical pro drop
agglutinative *wh*-phrases	fusional *wh*-phrases
wh-in-situ	(potential) *wh*-movement
e.g. Chinese, Japanese, Turkish, ...	e.g. Dutch, English, Arabic, ...
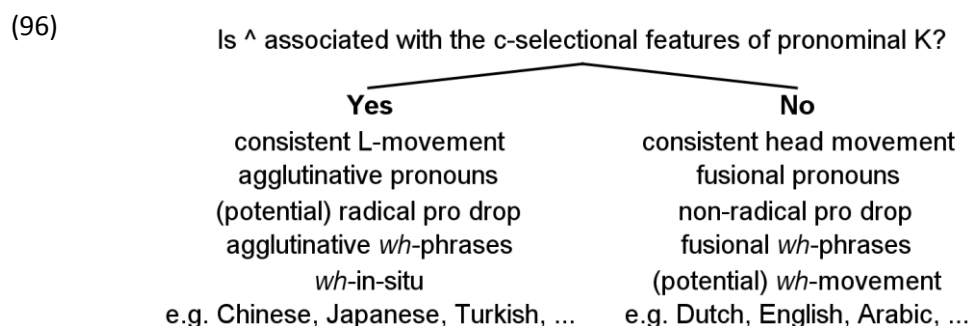
This arguably represents a true Borer-Chomskyan macroparameter. Variation in ^, one of the formal features of the functional head K, leads to several diverse consequences, linking three distinct areas of the grammar – morphological structure, *wh*-behaviour, and the availability of pro drop. By relying on considerations of learnability and the structure of the syntax, it has thus been possible to limit the hypotheses available to the language acquirer, and so even in a Borer-Chomskyan system, it seems possible to maintain some of the structure of the traditional P&P approach, while navigating around many of its difficulties. Thus far, however, this macroparametric proposal has been based only on a somewhat narrow pool of data, and so in the following section I carry out a preliminary test for its validity on a wider scale.

5. Testing The Generalisations.

5.1 The hypotheses involved.

The putative macroparameter argued for in the previous two sections is essentially based on three proposed linguistic universals, which can be stated as follows:

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[23] The [+int] specification of *wh*-phrases prevents the radical pro drop rule from applying to them.

(97) radical pro drop → agglutinative pronouns

(98) agglutinative pronouns ↔ agglutinative *wh*-phrases

(99) agglutinative *wh*-phrases → *wh*-in-situ

The first of these, (97), is the subject of N&S, which they show to be well supported across a wide range of languages. However, while preliminary evidence suggests that (98) (argued for in section 4.5) and (99) (section 4.4) are reasonable hypotheses to make, we have yet to check them against more than a small number of languages. In order to test these generalisations, I make use of *The World Atlas of Language Structures Online* (Dryer and Haspelmath 2011, henceforth *WALS*), which gives a wide-ranging survey of the properties of many languages, and also allows for the combination of maps of different grammatical features. This thus provides an excellent resource for the investigation of language universals.

The difficulty, however, is in determining which maps are best for confirming the universals proposed in (97-99), with (98-99) being difficult to examine on their own from this perspective, as no maps refer specifically to the structure of *wh*-phrases.[24] The three most relevant maps, then, are 'Expression of Pronominal Subjects' (Dryer 2011a), which relates to radical pro drop, 'Position of Interrogative Phrases in Content Questions' (Dryer 2011b), which relates to *wh*-in-situ, and 'Plurality in Independent Personal Pronouns' (Daniel 2011), which, to an extent, relates to the agglutinative nature of pronouns. However, while this last map is used in N&S's investigation of (97), it is somewhat problematic for our purposes, as agglutinative pronouns are not identified very reliably, with only Pers and Num being referred to, which as we have seen could appear fusional even in agglutinative languages. Thus I leave this map aside, but it is likely that it would be useful in more detailed investigation of (97-99). This leaves us able to investigate radical pro drop and *wh*-movement, and so it is possible to examine the following putative universal, arrived at from (97-99) by deduction:

(100) radical pro drop → *wh*-in-situ

While this does not test all aspects of the macroparametric proposal, it has the advantage of covering all three of the universals involved, and so it makes a useful starting point for confirmation of the key hypotheses in this thesis. Thus I combine Dryer (2011a) with Dryer (2011b), giving the following result:

---

[24] One further potential problem with (98-99), not mentioned in section 4, is the fact that the predictions about *wh*-structure are of their syntactic, rather than phonological, structure, and so they may not always hold surface-true. For instance, if we imagine a language much like Arabic but with agglutinative pronouns, the *wh*-phrases in this language might appear phonologically fusional, but by hypothesis the agglutinative pronouns would lead to *wh*-phrases in fact being underlying agglutinative (i.e. formed by L-movement). It is unclear to what extent this consideration should hold.

	Initial interrogative phrase	Not initial interrogative phrase	Mixed
Obligatory pronouns in subject position	24	38	5
Subject affixes on verb	82	191	4
Subject clitics on variable host	14	7	0
Subject pronouns in different position	7	36	3
Optional pronouns in subject position	**7**	40	**1**
Mixed	11	14	0

Table 11: 'Expression of Pronominal Subjects' combined with 'Position of Interrogative Phrases in Content Questions.'

We predict, following (100), that there should be no radical pro drop languages that are not *wh*-in-situ, and so potential exceptions are highlighted in the table – these are languages that can optionally drop subjects without agreement marking on the verb, and so potentially exhibit radical pro drop, and also have initial or mixed *wh*-phrases, and so may not be *wh*-in-situ. The following languages meet these criteria, with Korku being the only language with mixed positions of interrogative phrases:

   (101) Epena Pedee, Klamath, Korku, Martuthunira, Mokilese, Yindjibarndi, Yoruba, Yuwaalaraay.

I now turn to examining each of these languages.

   5.2 Investigating the apparent exceptions.

While the *WALS* investigation has allowed us to identify several potential exceptions, it should be noted that the criterion used to identify radical pro drop languages is not completely accurate, as radical pro drop languages are those which allow for the dropping of all pronominal arguments, whereas we have only identified those that allow for subject dropping in some situations. Thus we should expect some of the languages in (101) not to exhibit true radical pro drop, which indeed seems to be the case for Yoruba, Mokilese, and Klamath. Of these, Yoruba is also considered by N&S (p.707), who note that in this language "the only context in which a subject can be omitted is when a third person singular pronoun occurs before the negation marker *kò* or the future tense marker *yó*," citing Bamgbose (1967:42), and so suggesting that "it is very unlikely that Yoruba has radical pro drop." We are thus able to exclude Yoruba from our list of exceptions.

I next consider Mokilese, which also seems unlikely to have radical pro drop, as Harrison and Albert (1976:91) demonstrate that only inanimate singular subject pronouns (102) may be omitted, and inanimate object pronouns (103) must be omitted:

   (102) a. ma suhkoahu kupdi, (ih) nen koauwehla umwwo
               if tree falls (it) prepred wreck house
               'If that tree falls, it will wreck the house'
         b. poappok mwahl pwa *(arai) ne wengla
               no.good boards because they already warped
               'Those boards are no good because they're already warped.'

(103) a. ngoah kapikihla jeriho pel kikihdi *(ih)
             I dropped child again kicked him
             'I dropped the child and kicked him.'
       b. ngoah kapikihla jahrro pel kikihdi (*ih)
             I dropped knife again kicked
             'I dropped the knife and kicked it.'

(adapted from Harrison and Albert 1976:91)

While these constraints on pronoun dropping are somewhat unusual and merit further investigation, what is clear is that Mokilese does not appear to show the free pronoun omission typical of radical pro drop, and so we can also exclude it from (101).

The last such case is Klamath, which, *contra* Dryer (2011a), which does not seem to be clearly identified as allowing subject omission, with the reference given, Gatschet (1890:417), noting that "the subject pronoun can either precede the absolute form of the verb … or follow it," but giving no suggestion of pronoun omission. However, the texts in Barker (1963) do show several examples of omitted subjects, but omitted objects appear to be rare or non-existent. Thus I tentatively conclude that Klamath is not radical pro drop and leave it aside, although more investigation may be necessary.

I now move on to cases which are identified as having initial interrogative phrases, but may not have true *wh*-movement. The first such case is the only "mixed" language, Korku, which with Drake (1903:142) stating that "[i]nterrogative pronouns stand at the beginning of a sentence, and interrogative adverbs immediately before the verb," giving only two examples:

(104) **yē** ālē antin shiṅgēl tiṅgyēbā?
          '**Who** will kindle a fire for us?'

(105) am **chōl** hēen?
          '**When** didst thou come?'

Without further examples, it is difficult to determine precisely what underlies this behaviour, but given the analyses we saw in section 4 of *wh*-fronting in "optional" movement languages in fact being a type of cleft construction (see especially Cheng 1991:ch.3), it is likely that the same is true here, especially given the highly agglutinative *wh*-phrases (Drake 1903:25-27). Thus we can suppose Korku is a *wh*-in-situ radical pro drop language, and so is not an exception.

Another possible such case is Epena Pedee. While it is clear that *wh*-phrases are usually fronted (Harms 1994:17, 122), as in (106), there are also cases such as (107) where the subject is not initial:

(106) kʰáa-ta kʰo-hí-ma josé-pa
          what-FOC eat-PAST-INTRG José-ERG
          'Did José eat plantains?'

(Harms 1994:122)

(107) wárra mɨ wárra sá̃-ma bɨ́-ma a-hí
          son my son which-LOC be-INTRG say-PAST
          '"Son, where is my son?" he said.'

(Harms 1994:123)

While this example is perhaps somewhat obfuscated by indirect speech, Harms (1994:123) notes that "the topicalization of another phrase results in the interrogative proform not beginning the sentence." While this may merely be due to topics raising to a higher position than moved *wh*-elements (Spec,TopP as opposed to Spec,FocP), it is possible that *wh*-elements and topicalised constituents compete for Spec,TopP, with *which* being in-situ in (107) (note that the language has SOV word order – Harms 1994:11). While far more examples would be necessary to confirm this, it is possible then that this *wh*-"movement" is in fact a kind of topicalisation. This analysis, is, however, somewhat surprising, and I briefly suggest an alternative approach in footnote 25. For now, however, I do not view Epena Pedee as an exception.

This leaves us with three languages – Martuthunira, Yindjibarndi, and Yuwaalaraay. All three are in the Pama-Nyungan language family, with Dench (1995:5) suggesting Martuthunira and Yindjibarndi are both members of Ngayarda subgroup, and so are more closely related. I start, then, with these two languages, both of which appear to exhibit *wh*-movement (108-109):

(108) nhartu-u nhuwana nhawu-lha?
       what-ACC 2.PL see-PAST
       'What have you seen?'

                                                                (Martuthunira, Dench 1995:237)

(109) a. ngana nhaa tyina pangkarrinha?
           who this foot go-PAST
           'Who walked here?'
       b. wanhtharni nyinta pangkarril?
           where-to you go-PRES
           'Where are you going?'

                                                                (Yindjibarndi, Wordick 1982:165)

Furthermore, both appear to be radical pro drop, although pronouns perhaps seem to be dropped more frequently in Yindjibarndi:

(110) ngayu wartawirrinpa-rra Ø parrani-nyila-a-rru wanthanha-la wii yakarrangu-la
       1.SG.NOM wait.for-CTEMP return-PRREL-ACC-NOW which-LOC or day-LOC
       'I'm waiting for [him] to return now, which day will it be.'
                                                                (Martuthunira: Dench 1995:76)

(111) Ø minytyuwarna Ø
       point.at-PAST
       'I was threatening to hit him with it.'

                                                                (Yindjibarndi: Wordick 1982:104)

Thus these two languages at least seem to present true exceptions. Furthermore, when examining their pronouns, it is unclear how irregular they are, with Martuthunira having "irregular first person singular, second person singular and first person dual inclusive forms," but otherwise being regularly inflected (Dench 1995:101). It is unclear to what extent *wh*-behaviour reflect this, with *ngana* ('who') being also irregular (Dench 1995:107) and *nhartu* ('what') taking "regular nominal suffixes," (Dench 1995:107):

	1.SG	2.SG	*ngana*, 'who'	*nhartu*, 'what'
NOMINATIVE	ngayu	kartu	ngana	nhartu
ACCUSATIVE	nganaju	kartungu	nganangu	nhartu-u
GENITIVE	nganaju	kartungu	nganala	nhartu-wu
LOCATIVE	ngathala	kartunga	nganalanguru	nhartu-ngka
EFFECTOR	ngathu	kartunku	nganalu	nhartu-ngku

Table 12: Partial paradigms of Martuthunira pronouns and wh-*phrases.*

(adapted from Dench 1995:65,101,107)

The situation is complicated by even regular inflection in Martuthunira having extremely complex allomorphy rules (see Dench 1995:ch.5), and so it is unclear how the irregular forms should be treated, both by the linguist and the acquirer. Although there is less allomorphy, the picture is similar in Yindjibarndi, with Wordick (1982:73-74) stating that "singular forms of the personal pronouns do not decline very regularly" for case, with second person pronouns being "just plain irregular," in addition to several other irregularities. Furthermore, *wh*-words regularly decline like nouns, with for instance *ngana* ('who') being declined as a proper noun, and *ngani* ('what') declining as a common noun (Wordick 1982:76), with the connection between *wh*-phrases, pronouns, and agglutinativity once again being unclear.

	1.SG	2.SG	*ngana*, 'who'	*ngani*, 'what'
NOMINATIVE	ngayi	nyinta	ngana	ngani
LOCATIVE	ngayhala	nyintala	ngana-la	ngani-ngka
ABLATIVE	ngayhalangu	nyintalangu	ngana-langu	ngani-ngkangu
INSTRUMENTAL	ngayhalu	nyintalu	ngana-lu	ngani-ngku
OBJECTIVE	ngayu	nyinku	ngana-ngu	ngani-yi
DIRECT ALLATIVE	nagyuwarta	nyinkuwarta	ngana-nguwarta	ngani-karta
INDIRECT ALLATIVE	ngayurraa	nyinkuurraa	ngana-nguurraa	ngani-purraa
COMITATIVE	ngayuwari	nyinkuwari	ngana-nguwari	ngani-pari
GENITIVE	ngaarntu	nyinkaarnrtu	ngana-ngaarnrtu	ngani-arntu

Table 13: Partial paradigms of Yindjibarndi pronouns and wh-*phrases.*

(adapted from Wordick 1982:56-60,74,76)

I now turn to Yuwaalaraay, which once again exhibits apparent *wh*-movement (112) and radical pro drop (113):

(112) ŋaan-di ŋinda ŋaray
          who-ABS 2.SG-NOM see-NONFUTURE
          'Who did you see?'

(Williams 1980:54)

(113) n̠irma ganugu bagaga wanagi Ø n̠iraŋa balal gigigu
          there 3.PL-nom bank-LOC throw-FUT there dry-ABS be-FUTURE.PURPOSIVE
          'They will throw (them) onto the bank to dry.'

(Williams 1980:107)

The pronominal situation is complicated, however, by the language having primarily nominative-accusative pronouns (once again with irregular first and second person forms – Williams 1980:48),

but also a limited set of more regular ergative-absolutive pronouns, which *wh*-words seem to be based on:

	3.PL	*ŋaan*, 'who'
ERGATIVE	ganu-gu	ŋaan-du
ABSOLUTIVE	ganu-ŋa	ŋaan-di
GENITIVE	ganu-ŋu	ŋaan-ŋu
DATIVE	ganu-ŋunda	ŋaan-ŋunda
SOURCE	ganu-ŋundi	ŋaan-ŋundi

Table 14: Partial paradigms of Yuwaalaraay ergative pronouns and wh-*phrases.*

(Williams 1980:50,55)

Once again, however, the correspondence is not entirely regular, with Williams (1980:50) noting that "the status of the *-di* suffix … is not clear." Furthermore, the language exhibits complex allomorphy rules.

What, then, can we say about these three languages? What is clear is that much further research is needed into the structure of their pronominal and *wh*-paradigms, with N&S (p.708) also noting the same for Guugu Yimidhirr, another Pama-Nyungan language. This research is well beyond the scope of this work, but it may be that such an approach would ultimately shed light on the somewhat unexpected properties of these languages, and ultimately determine how agglutinative they are. For now, however, I note them as possible exceptions to the generalisation in (97-100), with it also being possible that their properties arose as a result of being in an area of heavy language contact.

We have nonetheless attained quite promising results for our assessment of (100). Adding Korku and Epena Pedee to the set of putative radical pro drop languages, and removing Mokilese, Klamath, and Yoruba from the exceptions, we are left with 42 languages that fit our generalisation to 3 that do not, but clearly require investigation. While one of these 42 languages, Kayah Li, is argued not to be radical pro drop by N&S (p.707), it should also be noted that it is likely several radical pro drop languages are not included in the number, including Turkish, which is under "subject affixes on verb." I therefore conclude that our preliminary investigation of *WALS* has shown that the proposed macroparameter may hold across a wide range of languages.[25] Nonetheless, in the following section I consider an apparent exception that in fact suggests another possible setting of the parameter.

---

[25] While we have seen some positive results from the *WALS* survey, there remain exceptions that did not show up, yet are nonetheless problematic. Perhaps the most important of these is Finnish, which, as was noted above, was suggested by N&S (p.705) to be a language lacking the radical pro drop spell-out rule, given its lack of widespread argument omission despite its agglutinative pronominal morphology. We should nonetheless expect Finnish to be *wh*-in-situ, but this is not the case, with *wh*-phrases occurring sentence initially:

(i)   Missä Pekka ulkoilutti koira
        where Pekka.NOM walked dogs.PAR
        'Where did Pekka walk the dogs?'

(Huhmarniemi 2010:3)

However, Huhmarniemi (2009,2010) shows that in non-finite cases, content questions are not simple *wh*-extractions, with several A'-movements taking place:

6. American Sign Language – An Exception?

6.1 Two incompatible phenomena.

American Sign Language (ASL) has some somewhat surprising properties with respect to the above parametric proposal. Firstly, it appears to exhibit fully optional *wh*-movement:

(114) a. JOHN BUY WHAT
        'What did John buy?'
     b. WHAT JOHN BUY
        'What did John buy?'

(Petronio and Lillo-Martin 1997:26,50)

As ASL is generally considered to be underlyingly SVO (see e.g. Fischer 1975, Liddell 1980, Padden 1988), it seems likely that (114a) is a case of *wh*-in-situ, and (114b) a case of *wh*-movement. This is precisely what is proposed by Petronio and Lillo-Martin (1997), but (among others) Neidle, Kegl, Maclaughlin, Bahan, and Lee (2000) argue otherwise, suggesting that the only *wh*-movement in ASL is rightward, as in cases such as (115), and they dispute the grammaticality of cases such as (114a) (Neidle et al. 2000:127-128).

(115) LOVE JOHN WHO
      'Who loves John?'

(Neidle et al. 2000:210)

Such claims of rightward movement are somewhat theoretically surprising, and though Neidle et al. (2000:147-148) suggest that "modality-specific aspects of signed languages might account for particular differences between signed and spoken languages," there remain analyses that support the null hypothesis of leftward movement, including Petronio and Lillo-Martin (1997), and also Quadros' (1999) analysis of the related Brazilian Sign Language. Furthermore, recent evidence is in their favour, with Abner (2010) suggesting that unlike sentence-initial *wh*-phrases, the sentence-final constructions have distinct semantics and are best analysed as a type of cleft. Finally, Neidle et al. (2000) rely heavily on non-manual marking in their analysis, which is often considered to be the signed equivalent to prosody, and so may not be entirely appropriate for syntactic analysis (see

---

(ii)   [$_{AdvP}$ [$_{PP}$ [$_{DP}$ Kenen t_l taloa]$_l$ kohti t_k]$_j$ kävellessään t_j]$_i$ Pekka kaatui t_i
         whose house towards walking Pekka fell
         'Whose house was Pekka walking towards when he fell?'

(Huhmarniemi 2010:1)

Thus these questions are formed by a roll-up process, and we can suppose that L-movement triggers are present on certain interrogative heads, with movement resulting from these rather than Op to Spec,CP movement. Furthermore, it may be that a similar phrasal process underlies *wh*-fronting in Epena Pedee, with Harms (1994:122) noting that "[i]n questions in which information is sought about a constituent other than the subject, the subject usually follows the verb phrase," as in (106). Given the language is SOV, this suggests phrasal movement may have taken place, such as fronting of the entire vP.

Thus agglutinative languages showing *wh*-movement tend to exhibit some unusual properties, supporting them being underlyingly *wh*-in-situ. However, I still have no explanation for the standard *wh*-fronting in Finnish as in (i), so much further investigation is clearly necessary. Additionally, one other language, Evenki, appears to exhibit standard *wh*-movement, despite its agglutinative morphology (Nedjalkov 1997:10-11,214-216), perhaps as a result of contact with Russian, though this is still unexpected. Thus both Finnish and Evenki are potential exceptions to the macroparameter, though I leave them aside for now.

Sandler and Lillo-Martin 2006:459-470). We can suppose then, that ASL exhibits leftward movement[26], with this appearing to be the majority view.

Thus ASL appears to allow both true leftward *wh*-movement as well as *wh*-in-situ, which is somewhat unusual, with other seemingly "optional" languages either allowing *wh*-in-situ only in restricted contexts (e.g. Lebanese Arabic, French), or with fronted cases actually being cleft constructions (e.g. Egyptian Arabic, and perhaps Korku). As ASL fronted (as opposed to final) *wh*-phrases are not semantically distinct, and *wh*-in-situ is subject to no restrictions (Sandler and Lillo-Martin 2006:435), we can tentatively suppose that ASL is a true case of optional *wh*-movement, which while not ruled out by the current macroparametric proposals (so long as the pronouns and *wh*-phrases are fusional, but see below), is somewhat surprising, with most languages tending to exhibit mostly *wh*-in-situ or mostly *wh*-movement.

And this is not the only surprising property of ASL. In her analyses of ASL null subjects, Lillo-Martin (1986,1991) demonstrates that the language exhibits radical pro drop:

(116)   A: Did you eat my candy?
          B: YES, EAT-UP
               'Yes, (I) ate (it) up.'

<div align="right">(Lillo-Martin 1986:421)</div>

However, not all verbs are lack agreement in ASL – following Fischer and Gough (1978), and Padden (1988), plain verbs, such as *EAT-UP*, which don't inflect for agreement, can be distinguished from agreeing verbs such as *HATE*, which are marked via movement.[27] Interestingly, pronouns can equally be dropped with agreeing verbs:

(117)   A: Did $_a$John send $_b$Mary the paper?
          B: YES, $_a$SEND$_b$.
               Yes, (he) sent (it) to (her).'

<div align="right">(adapted from Lillo-Martin 1986:421)</div>

Under the current approach, where radical pro drop is not directly linked to agreement, these examples do not seem so unusual. However, Lillo-Martin demonstrates that null subjects exhibit some strange behaviour in more complex clauses with base-generated topics:

(118)   a. $_a$THAT $_a$COOKIE, $_1$PRONOUN HOPE $_a$SISTER SUCCEED $_b$PERSUADE$_c$ $_c$MOTHER **EAT** *($_a$PRONOUN).
               'That cookie$_i$, I hope my sister manages to persuade my mother to eat it$_i$.'

---

[26] One further *wh*-construction in ASL involves doubling of the *wh*-phrase, as in (i):

(i)   WHAT JOHN BUY WHAT
            'What did John buy?'

<div align="right">(Petronio and Lillo-Martin 1997:32)</div>

Such cases are analysed as leftward *wh*-movement combined with remnant TP topicalisation by e.g. Nunes and Quadros (2004, 2005) and Lillo-Martin and Quadros (2008), which is consistent with the current approach, and so I do not discuss these constructions further.

[27] For instance, in 'Mary hates John,' Mary would be associated with a locus *a*, and John a locus *b*, with inflection being glossed as $_a$HATE$_b$, indicating that the sign starts at *a* and moves towards *b* (Lillo-Martin 1991:28-29).

b. $_a$EXERCISE CLASS, $_1$INDEX HOPE $_b$SISTER SUCCEED $_b$PERSUADE$_c$ $_c$MOTHER **$_a$TAKE-UP**
($_a$PRONOUN).
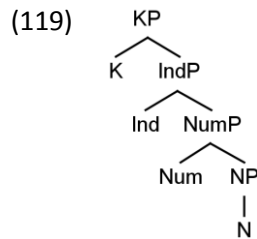'The exercise class$_i$, I hope my sister manages to persuade my mother to take it$_i$.'

(adapted from Padden 1988:92, Lillo-Martin 1986:423, Sandler and Lillo-Martin 2006:394-395)

While the agreeing verb allows both overt and null pronouns, the plain verb must take an overt pronoun. Thus Lillo-Martin suggests that null pronouns associated with agreeing verbs are Romance-style pros, true pronouns, whereas null arguments of plain verbs are, following Huang (1984), variables associated with null topics, and she therefore concludes that ASL exhibits both Romance-style pro drop as well as radical pro drop (see also Shepard-Kegl 1985, for Brazilian Sign Language Quadros 1995, and Bahan, Kegl, Lee, MacLaughlin, and Neidle 2000 for a dissenting view, and Sandler and Lillo-Martin 2006:398-403 for a reply). While this approach is not entirely compatible with the phonological analysis of radical pro drop assumed throughout, and so requires more thorough investigation, it seems possible to suppose that ASL has some features both of radical pro drop and Romance pro drop, or perhaps merely that it sometimes, but not always, allows radical pro drop. This is problematic on two levels – the first is that languages with radical pro drop should consistently allow it, and the second is that such languages should have agglutinative pronouns, but we have already seen that based on ASL's *wh*-behaviour, we predict them to be fusional. I thus turn to an analysis of pronouns and *wh*-phrases in ASL.
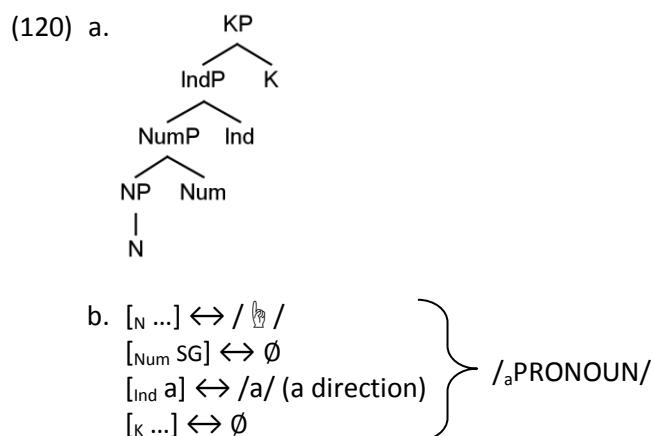
6.2 ASL pronominal and wh-*morphology.*

ASL pronouns are based on the pointing handshape, ☝ , and indicate loci that have previously been established in the discourse, with Sandler and Lillo-Martin (2006:371) noting that "[f]or physically present referents, their current locations are generally used; for non-present referents, other locations (often arbitrary) are established as associated with these referents," with pronouns then indicating loci by pointing. Thus some have characterised ASL pronouns as simply being a case of pointing, with Evans and Levinson (2009:431) suggesting that "ASL … lack[s] pronouns, using pointing instead." However, this view is overly simplistic, especially in the light of studies such as Pettito (1987), who shows they are acquired much as pronouns are in spoken languages. We can, therefore, suppose that they have a functional structure similar to that assumed for pronouns above, with some slight modifications.

Out of K, Pers, Num and Gen, ASL only appears to realise Num, with hand motions being used to indicate singular dual, and distributive and non-distributive plurals (Sandler and Lillo-Martin 2006:376-377), though Japanese Sign Language also realises gender (Fischer 1996:110), so it is likely that the categories present in signed pronouns vary much as in spoken languages. While early approaches (e.g. Friedman 1975) distinguished first, second, and third person as in spoken languages, Meier (1990) and Lillo-Martin and Klima (1990) reject this approach, with Meier arguing only for first and non-first persons, and Lillo-Martin and Klima suggesting that loci are in fact the referential indices of pronouns, given their infinite number and distinct nature, with each locus referring to only one individual within a given discourse. Adapting this approach slightly (Lillo-Martin and Klima instead suppose *all* pronouns have similar referential indices, with them only being overt in signed languages), we can suppose that in place of PersP, ASL pronouns have an index phrase where a locus may be specified. Further supposing K to be null, we can assign ASL pronouns the following structure:

(119)
```
         KP
        /  \
       K   IndP
           /  \
          Ind  NumP
               /  \
             Num   NP
                    |
                    N
```
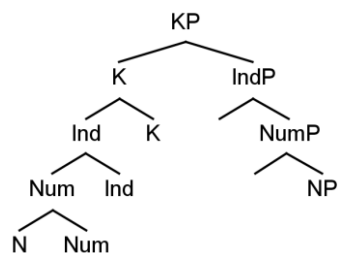
We now have the problem of associating phonological content with this tree, and thus determining whether L-movement or head movement occurs. The difficulty lies in determining what it means for something to be "agglutinative" or "fusional" in a signed language, given as Zeshan (2002:156) notes, "morphological complexity is almost exclusively *simultaneous* rather than sequential," with inflection being compared to "grammatical use of tone, ablaut and intonation in some spoken languages," (Zeshan 2002:158). Furthermore, there is no clear notion of a sign language word, but only one of signs, which act word-like from the perspective of syntax, as seen above, but are perhaps closer to a syllable at the phonological level, with early theories of sign phonology (e.g. Stokoe 1960) making heavy use of signs as units of structure, and even when movements are considered to be syllable nuclei (e.g. Liddell and Johnson 1989, Sandler 1989, Perlmutter 1992, Brentari 1990,1998) the majority of signs are monosyllabic, especially when morphologically complex (Sandler and Lillo-Martin 2006:228). We can suppose, then, that the KP projection must be expressed as a single sign, perhaps with some additional operation being necessary to simultaneously combine phonemes together into signs.

How, then, should we approach pronouns? For simplicity of exposition, I do not use any specific theory of phonology, but instead note that they can be divided into (at least) two components – the ☝ handshape, a direction, and in some cases a movement to mark number, a proposal that is readily adaptable to different phonological perspectives. The direction is clearly associated with IndP, and I propose that the ☝ handshape is associated with NP. However, there are two possible structures for the sign $_a$PRONOUN, depending on whether we view it as agglutinative (120) or fusional (121):

(120) a.
```
              KP
             /  \
          IndP   K
          /  \
       NumP   Ind
       /  \
      NP   Num
      |
      N
```

b. $[_N \ldots] \leftrightarrow$ / ☝ /
    $[_{Num} \text{SG}] \leftrightarrow \emptyset$
    $[_{Ind} \text{a}] \leftrightarrow$ /a/ (a direction)   } /$_a$PRONOUN/
 $[_K \ldots] \leftrightarrow \emptyset$

(121) a.

b. [$_{KP}$ +p, -a, SG, a] ↔ /$_a$PRONOUN/

It is difficult to determine which of these interpretations is correct. In fact, I very tentatively suggest that *both* are, with the condition on KP being a single sign leading to an ambiguity for the acquirer, with phonemes being viewable either as separate "affixes" or as components of a single root, a direct consequence of the monosyllabic and simultaneous nature of the pronominal sign. Thus the presence of ^ is underspecified, with pronouns being formed either by L-movement or by head movement.

As predicted, *wh*-elements appear to pattern with pronouns. Interestingly, several ASL wh-elements are also based on the 👆 handshape (*WHEN*, *WHO*, and one form of *WHERE* – see Sternberg 1990:566-567,569), so I suggest that unlike in spoken *wh*-elements, N is overtly realised. Furthermore, signs tend to involve repeated movements, so I suggest that the *wh*-morpheme is linked to iterativity. As a demonstration, I consider *WHERE*, which consists of a upwards, forward-facing 👆 handshape, with the finger being repeatedly moved from side-to-side (Sternberg 1990:566-567). Assuming that as IndP is like PersP and unused in interrogatives (a proposal that perhaps has even more support here, as signed *wh*-elements necessarily cannot be associated with a specific locus), and that NumP is not used, as in languages such as English, we can assign *WHERE* the following two possible structures:

(122) a.
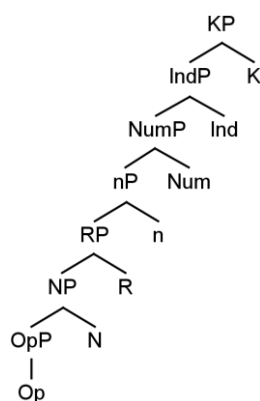
b. [$_N$ …] ↔ / 👆 /
   [$_R$ WH] ↔ iterative
   [$_n$ PLACE] ↔ upwards, forward facing, side-to-side movement   } /WHERE/
   [$_K$ …] ↔ ∅
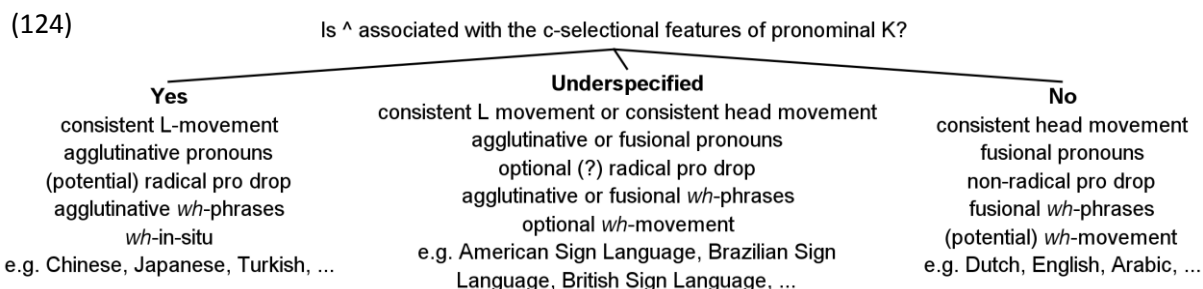
(123) a.
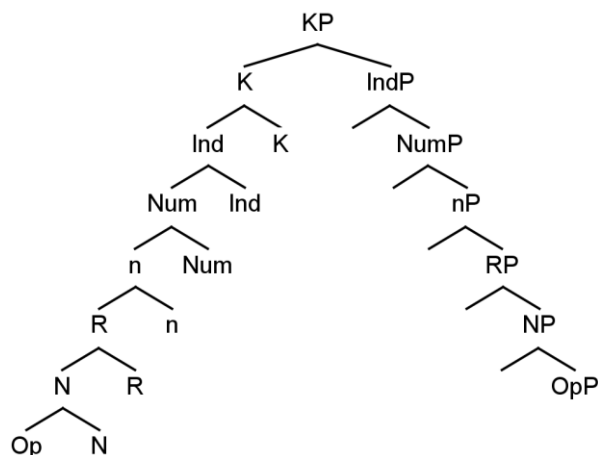
b. $[_{KP}$ +p, -a, +int, PLACE, WH] $\leftrightarrow$ /WHERE/

Thus *wh*-phrases potentially have the same ambiguity and so underspecification of ^ as pronouns, with more opaque *wh*-elements still potentially being syntactically agglutinative, making use of phrasal spell-out rules like those of Japanese *nani* ('what') and *dare* ('who'), only with null K. Furthermore, if the hypothesis that *wh*-structure is based on pronoun structure turns out to be correct, then the ambiguity of pronouns ensures the ambiguity of *wh*-phrases, whatever their surface phonological appearance.

We have now reached a possible explanation of the problematic phenomena discussed in 6.1. If modality underspecifies ^, then we should expect *wh*-phrases and pronouns to occur both agglutinatively and fusionally. This in turn would lead to optional *wh*-movement and optional radical pro drop, the former of which appears to be the case, and the latter requiring more investigation, but potentially allowing two settings of a parameter, although perhaps not optionally. Of course, for an appeal to modality to be valid, we should expect all signed languages to show such phenomena. While much more detailed crosslinguistic research is required here, preliminary data suggests this may be the case, with signed languages commonly being discourse-oriented (Sandler and Lillo-Martin 2006:ch.22), having similar pronominal structures (McBurney 2002), and potentially comparable *wh*-behaviour such as both initial and final *wh*-elements, and repeated movements in *wh*-phrases (Zeshan 2004). Furthermore, both Brazilian Sign Language (Quadros 1995,1999) and British Sign Language (Bazalgette 2011) may exhibit very similar phenomena to those seen in 6.1, with British Sign Language being unrelated to ASL (Stokoe 1973:365), and also showing iterative *wh*-elements based on the pronominal handshape (Woll 1981). We can therefore very tentatively conclude that in the case of signed languages, the macroparameter must be underspecified.

7. Conclusion.

Over the course of the above discussion, we have arrived at the following macroparameter:

(124)

Is ^ associated with the c-selectional features of pronominal K?

Yes
consistent L-movement
agglutinative pronouns
(potential) radical pro drop
agglutinative *wh*-phrases
wh-in-situ
e.g. Chinese, Japanese, Turkish, ...

Underspecified
consistent L movement or consistent head movement
agglutinative or fusional pronouns
optional (?) radical pro drop
agglutinative or fusional *wh*-phrases
optional *wh*-movement
e.g. American Sign Language, Brazilian Sign
Language, British Sign Language, ...

No
consistent head movement
fusional pronouns
non-radical pro drop
fusional *wh*-phrases
(potential) *wh*-movement
e.g. Dutch, English, Arabic, ...

This is similar to the parameters of early P&P theory in terms of its explanatory scope, but crucially differs from them in a number of respects. Instead of parametrising the syntactic system itself, (124) is clearly located in the lexicon, being set as the learner acquirers pronominal K, and so is entirely in line with the Borer-Chomskyan approach to parametric variation. Furthermore, the grammar is divided up in new ways, with morphology, *wh*-movement and null subjects all being linked, areas that are usually thought of being unrelated and controlled by at least three distinct parameters. Finally, while the parameter is somewhat structured, with limited options being available, this structure arises not through arbitrary stipulation, but through acquisitional considerations and the emergent properties of the syntax, and so I suggest that this is the ideal form of a macroparameter.

While the initial survey in section 5 suggests that (124) has some empirical backing, the discussion has been necessarily very speculative at points, and so it is possible that it may not stand up to further research. Should this particular proposal fail, however, I hope to have shown that c-selectional features can nonetheless be a lexical locus of macroparameters, and thus we should not abandon the Borer-Chomsky conjecture too readily.

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