Quirky Case and 'Co-generative' LFG+Glue*

Avery D. Andrews
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A feature of Icelandic that has been of interest since Andrews (1976) and Thráinsson (1979) has been the phenomenon often called 'Quirky Case' (QC), whereby NPs in a variety of traditional oblique cases can occupy apparent subject, object and second object position, in a rather large number of combinations, with interesting consequences for grammatical theory.[1] In this paper, I will argue that the best account of QC is still the 'two layer' analysis of Andrews (1982a, 1990a), henceforth A82/90, in which QC NPs have an outer layer of structure that is usually devoid of agreement-related features, which, in effect, often conceals the inner layer, where these features are both interpreted semantically, and spelled out in the morphology. This accounts for the main peculiarity of QC NPs, their non-agreement with main predicates, as well as their apparently paradoxical agreement with secondary predicates and certain kinds of controlled complements, and explains some further odd phenomena.

Although the analysis has a degree of transportability across frameworks, I will present it here in a version of LFG supplemented with 'glue semantics',[2] in which there is a kind of 'feature interpretation' developed in Andrews (2007a, 2008, 2010), that solves certain problems with the A82/90 version, including excessive stipulation and promissory notes on semantic interpretation. Along with a theoretical cleanup, this results in a sketch of an explicit account of how the intricacies of Icelandic case-marking and agreement are connected to formal semantic interpretation, something which I don't think has been achieved before.

It isn't really possible to analyse Quirky Case in complete independence from all the other kinds of case-marking, so we will also provide an analysis of 'regular' case-marking in Icelandic, accepting the general classification of case in Boboljik (2008) as 'default', 'dependent' or 'oblique/semantic' (although rejecting his attempt to eliminate GF from the typology of agreement). QC will be treated as a somewhat odd configuration in which the oblique/semantic case appears inside a core GF-bearer. Somewhat paradoxically, we will also claim that the treatment is substantially consistent with the construction-grammatical treatment of Icelandic case-marking in Barðdal (2008), in spite the fact that she denies the existence of any difference between QC and the other kinds of case-marking. The reason is that in the present approach, the differences lie in certain technical details of implementation, rather than a simple observational concept

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[1]For a comprehensive, recent overview, see Thráinsson (2007).

[2]Dalrymple (2001), Asudeh (2004), and numerous other sources.

of 'regular' vs. 'irregular', and the case-marking properties of verbs are determined by a 'semantic lexicon entry' (SLE) which can be regarded as being a lexical construction in the sense of Construction Grammar (and notated rather similarly).

An important limitation of scope in this paper is that we will not be making any attempt to systematically deal with the relationships between QC and valence alternations, as explored for example in Svenonius (2002) Sigurðsson (2009b). In LFG, phenomena such as these would fall under a different component of the grammar, lexical rules, which will not be investigated here.

1 'Quirky' Case

'Quirky Case' (QC) is one of the names that has emerged for the phenomenon whereby nearly a thousand Icelandic verbs specify 'non-canonical' cases on their subjects, objects and 'second objects',[3] in a considerable number of combinations.[4] In this section we will examine various aspects of the behavior of these 'QC NPs', and discuss how A82/90 is supposed to account for them.

1.1 Quirky vs 'Regular'

Unfortunately, there is some controversy about which cases are Quirky or non-canonical, and, indeed, how truly noncanonical most of the uncontroversial QC NPs are actually are, since they tend to fall into semantically definable groups that have at least limited productivity (Jónsson (2003), Barðdal (2011)). Therefore, I will begin by characterizing them in a somewhat 'dogmatic' manner, attempting to justify the dogma later in the paper.

The default/canonical (and by far most frequent, on either a token or verb-type basis) case for subjects is nominative, but subjects can also be dative, accusative or genitive. The notion of non-nominative subject struck many people as rather exotic when it was introduced, but the evidence for their existence in Icelandic has proliferated to a level well beyond any reasonable doubt. For a recent overview, see Sigurðsson (2004). The most striking property of the non-canonical subjects, which I will take to be an essential attribute of Quirkiness in Icelandic, is that they don't participate in person-number agreement with the finite verb.[5] Some typical examples are:

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[3]The term we will use for the second bare NPs after the verb, in SVOO sentences.

[4]Obeying various restrictions, the most important of which is that truly Agentive subjects can never be Quirky. See Jónsson (2003) for a discussion of the semantic concomitants of Quirky Case.

[5]However, examples of such agreement do appear in Icelandic performance (Árnadóttir and Sigurðsson, 2008), as will be discussed later, and there are cases where features on a Quirky Subject seem to assist agreement that's basically with something else (Holmberg and Hróarsdóttir, 2003). Furthermore, similar examples have an impressively high rate of acceptance in Faroese (Jónsson and Eythórsson, 2005). This will be considered later in the paper.

(1) a. Við   fórum   til Íslands
       we(N) went(1PL) to Iceland
       We went to Iceland

    b. Mér   líkar   þessi bíll
       me(D) like(3SG) this car(N)
       I like this car

    c. Okkur   vantar   peninga
       us(A.PL) lack(3SG) money(A)
       We lack money

    d. Verkjanna   gætir   ekki
       the pains(G.PL) is noticeable(3SG) not
       The pains are not noticeable

In (a), we get full person-number agreement on the verb, while in (b-d) we see combi-
nations of first person and plural number on the subject failing to be registered on the
verb, which remains in a 'neutral' 3rd person singular form.

For objects, things are a bit more complicated. Any of the four cases can also appear on
objects, but subject to certain limitations. Accusative is clearly the commonest, while
nominative on objects appears only when the subject is dative, is in (1b).[6] Dative on
objects is however fairly common, and appears to be the default for certain semantic
roles, such as 'propelled object'. Genitive on the other hand is small and dwindling.

When the subject is nominative, the object must be non-nominative, and the way the
cases are treated under passivization indicates that the dative and genitive objects are
QC NPs. In the passive, accusative objects become nominative, and both the passive
auxiliary and the passive participle form of the verb agree with them (in gender, number
and case, for the participle):

(2) a. Hann barði   strákana
       he   hit(3SG) the boys(A.M.PL)
       He hit the boys

    b. Strákarnir   voru   barðir
       the boys(N.M.PL) were(3PL) hit(N.M.PL)
       The boys were hit

Genitives and datives, on the other hand, retain their case, and the auxiliary is third
person singular, with the participle appearing in a neuter gender singular form that is
neutral between nominative and accusative:

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[6]Thráinsson (2007) discusses some other instances of potential nominative objects, but these are
all idiomatic expressions in which the nominative apparent object and the verb constitute a complex
predicate.

(3) a. Strákunum   var   bjargað
       the boys(D.PL) was(3SG) rescued(N.Nt.SG)
       The boys were rescued

    b. Þeirra   var   beðið
       they(G.PL) was(3SG) waited for(N.Nt.SG)
       They were waited for

If we take nonagreement to be a major symptom of Quirkiness, and assume that it is more likely that Passive preserves Quirkiness than imposes it, the conclusion is that the dative and genitive objects are Quirky, whatever this property turns out to be, whether just 'noncanonicality' of case-marking, or some peculiar structural feature such as having two layers.

Nominative objects on the other hand never Passivize, and show some other behaviors which cause me to put them into the non-Quirky basket, as will be discussed in subsection 5 below. Since nominative on an object is presumably 'non-canonical' by virtue of being part of a minority Dat-Nom case-marking pattern, this decision requires that Quirkiness not be the same thing as noncanonicality.

In addition to the patterns presented above, there are Acc-Acc verbs (a few), and one Acc-Gen verb, which appears to have fallen out of colloquial usage (Thráinsson, 2007, pg. 169). Our analysis will require that the object ACC of the Acc-Acc verbs be quirky, although there is no substantial independent evidence for this.

Moving on to ditransitives, the Nom-Dat-Acc (NDA) pattern is by far the commonest, although there are several others. The subject is always nominative, and there is a regularity that if the second object is an accusative true participant, then the first object is always dative.[7] This means that, observationally, the dative on the first object of a ditransitive verb is highly predictable, a point first made by van Valin (1991). However, in terms of behavior under the passive, it's the dative that shows Quirkiness. This gives us a relatively concrete observational indication that there might be a difference between Quirkiness and noncanonicality.

It's an interesting fact about the passivization of the NDA verbs that for some of them, either the dative or accusative can appear in the subject position, but, whichever does, the dative retains its case, and the accusative becomes nominative (Thráinsson, 2007, pp. 135-6). Furthermore, both the auxiliary and participle agree with it:

(4) a. Hann gaf mér   peningana
       he   gave me(D) the money(A.M.PL)
       He gave me the money

    b. Mér   voru   gefnir   peningarnir
       me(D) were(3PL) given(N.M.PL) the money(N.M.PL)

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[7]The two instances of an NAA pattern, *cost* and *take* (a period of time) have the second accusative as a semantic measure-phrase (Thráinsson, 2007, 173). I take these to not be true participants.

I was given the money

c. Peningarnir   voru   gefnir   mér
the money(N.M.PL) were(3PL) given(N.M.PL) me(D)
I was given the money

The ditransitives agreement phenomenon will be discussed later; for the present, note that the case-preservation of the dative recipient indicates that in spite of its predictability, it is Quirky, according to the definition used here (and the usual arguments for non-nominative subjects show that the dative is indeed the subject in (b)). For ditransitives other than these, only the first object becomes subject under Passive.

Having introduced some of the behavior of QC NPs, we'll present a structural hypothesis to account for and at least partially explain their behavior.

1.2 The Quirky Structure Hypothesis

The basic idea of A82/90 is that QC NPs have the structural peculiarity of having two layers in their abstract structure, an inner layer where the features spelled out on the nominal (and in NP-internal 'concord') reside, and an outer layer, usually empty in Icelandic, where non-secondary predicates look for their agreement features, and find them, with non-QC NP, which have only one layer. An overt model for this kind of structure, where two layers and their effects on agreement are morphologically visible, is provided by certain Bantu languages such as Chicheŵa (Bresnan and Mchombo, 1995). In the example below (50a, p.209), we can see the two morphological layers on the subject NP, with the verb agreeing with the outer layer, which expresses a locational relationship:

(5) Pa-mu-dzi   w-áthú p-ó-chítítsa   chĭdwi pá-ma-sangaláts-á
16-3-village 3-us   16-NONFIN-attract interest 16-PRS HAB-please-IND
alĕndo
1-visitor
Our interesting village pleases visitors

Interestingly, attributive modifiers can agree with either layer, depending on their concentric position with respect to the head noun, as discussed by Bresnan and Mchombo.

A82/90 resembles this treatment of Bantu, except that the outer layer doesn't usually have any feature content (and never any that is interpreted there), and in f-structure, the inner layer appears as value of the case-label, used as an attribute of the outer layer, a formalistic trick that we will dispense with later.

So for example the sentence (6a) gets the structure (6b):

(6) a. Okkur   rak   á land
       us(A.PL) drifted(3SG) to shore
       We drifted to shore

b.
$$
\begin{bmatrix}
\text{SUBJ} & \begin{bmatrix} \text{ACC} & \begin{bmatrix} \text{PRED} & \text{‘Pro’} \\ \text{NUM} & \text{PL} \\ \text{PERS} & \text{I} \\ \text{CASE} & \text{ACC} \end{bmatrix} \end{bmatrix} \\
\text{TENSE} & \text{PAST} \\
\text{PRED} & \text{‘Reka(SUBJ ACC, PCOMP)’} \\
\text{PCOMP} & \begin{bmatrix} \text{PRED} & \text{‘Á’} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{‘Land’} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$

This structure is supposed to explain the failure of finite verb agreement to register the person and number features of the Quirky subject, as follows.

In LFG, the agreement specifications for finite verbs need to specify person and number values for the subject attribute of the verb, in a manner that can be conveniently depicted like this for the first person plural:

(7)
$$
um: \quad \begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{PERS} & \text{I} \\ \text{NUM} & \text{PL} \end{bmatrix} \end{bmatrix}
$$

The idea is that in a structure like (6b), these specifications would have to apply to the top level of the structure, which would cause a problem.

But exactly what problem? In Classic LFG, there is in fact no reason why a specification like (7) (technically, its obvious recasting as a set of ‘defining equations’) couldn't just dump person and number features at will into the upper level of the SUBJ-value of (6), thereby allowing things like *Okkur rökuð (2PL) á land*, as well as *Okkur rökum(1PL) á land*. But this is typologically unheard of. A82/90 stipulatively imposed the restriction that the agreement specifications be ‘constraining equations’, an LFG facility whereby a specification can require something to be present without actually putting it there. This solves the immediate descriptive problem, but is clearly too stipulative. A possible alternative would be to install some kind of conflicting values for NUM and PERS on the upper level, but this would also be stipulative, especially because LFG does not use the kinds of feature-typing constraints that might be used to install such values automatically in a framework such as HPSG. Requiring specific feature-values in the outer layer would furthermore run into difficulties with the A82/90 analysis of agreement with nominative objects, as we shall see.

Andrews (1990a) discussed this problem, suggesting that the real answer had something to do with semantics, but was unable to propose anything of a concrete nature. Using glue semantics, we will finally be able to fix this problem, essentially on the basis that person and number features can't exist in f-structures without being semantically interpreted, in a sense we'll develop more precisely in subsection 2.1 below.

1.3 Quirky Structural Behavior

An important fact is that passive participles appear obligatorily in the accusative case under certain circumstances, especially when they have a non-Quirky surface subject that is appearing in the accusative position of an '*accusativum cum infinitivo*' (ACI) construction, a.k.a. derived object position of an SOR verb a.k.a. ECM construction. Some examples are:

(8) a. Fólk telur hana hafa verið ríka
people believe her(A.F.SG) to have been rich(A.F.SG)
People believe her to have been rich

    b. Hún er talin hafa verið rík
she(Nom) is believed(N.F.SG) to have been rich(N.F.SG)
She is believed to have been rich

    c. Ég álít hana vera talda hafa verið ríka
I think her(A.F.SG) to be believed(A.F.SG) to have been rich(A.F.SG)
I think that she is believed to have been rich.

These examples illustrate how the passive participle in the intermediary clause (and also the predicate adjective in its complement) changes case to agree with whatever case its 'understood subject' is showing in the overt structure.[8]

(Andrews, 1982a, pg. 469) observed that if the bottommost verb in a structure like this was one that took a Quirky accusative object, then the agreement with an accusative became optional. To test this, I included some sentences of this form in a questionnaire distributed at the University of Iceland in 1983, including these examples:

(9) a. Þeir segja hana vera talda elska Svein
They say her(A.F.SG) to be believed(A.F.SG) to love Svein(A)
They say that she is believed to love Svein

    b. Þeir segja hana vera talið elska Svein
they say her(A.F.SG) to be believed(N.Nt.SG) to love Svein(A)

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[8]This collection of examples is extended somewhat to make this point in Thráinsson (2007, p. 438).

     c. Þeir segja hana   vera talda   vanta peninga
        they say   her(A.F.SG) to be believed(A.F.SG) to lack money(A)
        They say that she is believed to lack money

     d. Þeir   segja hana   vera talið   vanta peninga
        They say   her(A.F.SG) to be believed(N.Nt.SG) to lack money(A)

This questionnaire was returned by seven respondents, who scored it as follows, where the top two grades can be regarded as 'OK', the middle two as 'doubtful', and the bottom two as 'bad' (see Andrews (1990a) for discussion of the scale and its characterization in the questionnaire; the low usage of the lowest acceptability grade was probably due to a design error):

(10)

	✓	?	??	?*	*	**
a.	5	1	1	0	0	0
b.	0	0	0	0	7	0
c.	5	2	0	0	0	0
d.	1	3	0	1	2	0

Agreement of the intermediate passive participle was accepted by all respondents for both examples, but non-agreement was only possible, for a bit more than half of the respondents, when the complement verb took a Quirky accusative subject (agreement of the participle with a Quirky accusative in finite subject position is completely impossible).

The acceptability of agreement for all respondents can be explained on the basis that most of the possible choices for material that would come after the participle would in fact require agreement: there are only a small number of verbs that take Quirky accusative subjects, and the verb doesn't appear until after the participle. By contrast, when the Quirky accusative appears in finite subject position, it's appearing in a place where nominative is normally expected, and so its Quirky nature is evident before agreement with it has to be manifested. It would be good if this were tested on a larger scale (and compared with results for genitive and dative Quirky subjects), but the motivation for including some sort of special property in the internal structure of the Quirky NP would seem evident.

In particular, proposals such as that of Sigurðsson (2009a) to implement Quirky case in terms of "little v's" with extra *'s doesn't seem sufficient. The 'enhanced little v' would sit on top of the lowest verb, but somehow has to interfere with the agreement of a higher one with its moved complement:

(11) [NP V_{pass} ... [v* NP ...]]

This would appear to show that there must be some special material in the Quirky NP itself.

There are various possible ideas about what the special material might be, the simplest of which is that the Quirky accusative is just a different feature-value than the regular accusative, which is spelled differently on predicate modifiers than on nominals (and their attributive adjectives). But phenomena of agreement of secondary predicates and similar items, investigated extensively by Sigurðsson (1991, 2002, 2008) shows that this won't work either:

(12) a. Strákana   rak   þyrsta   og svanga   á
       the boys(A.PL.M) drifted(SG) thirsty(A.PL.M) and hungry(A.PL.M) to
       land
       shore

    b. Strákana   vantaði   alla   í skólann
       the boys(A.PL.M) lacked(SG) all(A.PL.M) in school
       The boys were all absent from school

The morphology of these accusative secondary predicates modifying Quirky accusatives is identical to that of normal accusatives and predicates of all kinds agreeing with them, so merely adding on an additional feature value would be completely unmotivated.

Main predicate adjectives, on the other hand, act like passive participles in not agreeing with their quirky subject:[9]

(13) Mér   er kalt
     me(D) is cold(N.Nt.SG)
     I am (feel) cold

The two-level hypothesis provides an explanation of why secondary predicates agree with their understood subjects, even though the main predicates we have been considering don't (although there is an annoying analytical indeterminacy to deal with).

In LFG, the standard analysis for secondary predicates is that they are 'XADJUNCTs' with functional control, meaning that, in f-structure, they have subjects that are identical to their controllers. This predicts that they will agree obligatorily with a Quirky controller if they can be controlled by them at all.

The reason is that, in LFG, the semantic linking of the arguments of a predicate to the grammatical relations expressing them is 'dumb' in exactly the same way as agreement is. If a predicate says that its argument is to be found as value of its SUBJ attribute (or, more precisely, the SUBJ-value of its f-structure correspondent), it will look there, and if it finds nothing, the structure will 'crash' (unless some 'smarter' principle is proposed to save it, which would have to work in more environments that just an XADJUNCT). So, given that the semantics works as just described, an XADJUNCT
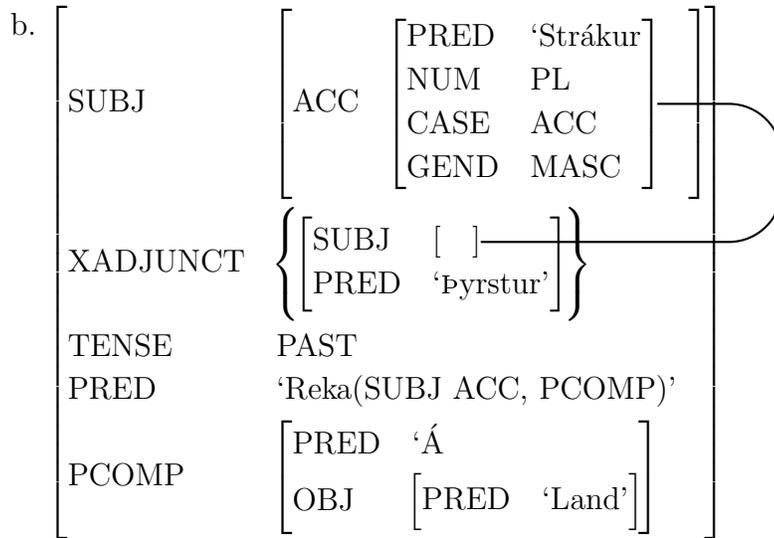
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[9]Note that the forms glossed 'N.Nt' (Nominative Neuter) are morphologically the same as Accusative Neuter).

can only be interpreted if its control equation identifies the inner layer of the controller NP with the SUBJ-value of the XADJUNCT, which means that agreement will work in the same way with a Quirky controller as with a normal one.

We illustrate this with the f-structure for a simplified example:[10]

(14) a. Strákana   rak   þyrsta   á land
the boys(A.M.PL) drifted(SG) thirsty(A.M.PL) to shore

b.
$$
\begin{bmatrix}
\text{SUBJ} & \begin{bmatrix} \text{ACC} & \begin{bmatrix} \text{PRED} & \text{`Strákur'} \\ \text{NUM} & \text{PL} \\ \text{CASE} & \text{ACC} \\ \text{GEND} & \text{MASC} \end{bmatrix} \end{bmatrix} \\
\text{XADJUNCT} & \left\{ \begin{bmatrix} \text{SUBJ} & [\ ] \\ \text{PRED} & \text{`Þyrstur'} \end{bmatrix} \right\} \\
\text{TENSE} & \text{PAST} \\
\text{PRED} & \text{`Reka(SUBJ ACC, PCOMP)'} \\
\text{PCOMP} & \begin{bmatrix} \text{PRED} & \text{`Á} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{`Land'} \end{bmatrix} \end{bmatrix}
\end{bmatrix}
$$

The agreement restrictions on the secondary predicate will have to be satisfied by the controller, regardless of whether it is Quirky or not.

The analytical indeterminacy alluded to above comes from the fact that (Sigurðsson, 2002, pg. 710) provides some examples where a secondary predicate can appear in the nominative rather than the case of the controller (here, dative):

(15) a. Henni leið illa   sem presti/prestur
her(D) went badly as   priest(D/N)
She was unhappy as a priest

b. Henni verður kalt svona fáklæddri/fáklædd
her(D) will be cold so   scantily dressed(D/?N)
She will be cold so scantily dressed

The nominative in (b) is a bit questionable, but nowhere near as bad the standard neuter non-agreement form would be. The possibility of nominative suggests that it is at least possible for secondary predicates to have 'PRO' subjects, since predicate adjectives agreeing with PRO subjects can in general be nominative. But agreement appears to be the norm, suggesting that functional control is the usual structure.

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[10]More discussion of how this kind of analysis works can be found in Haug (2008).

One might suppose that the a PRO analysis can explain why agreement with QC is normal, without reference to the two-layer idea, but this is not the case, because of the phenomenon of 'case-attraction' of PRO, discussed extensively for Ancient Greek by Quicoli (1982), and Icelandic by various authors, such as, recently Sigurðsson (2008). In case-attraction (called 'transmission' by Sigurðsson), items that are expected to agree with PRO manifest properties of the controller of the PRO rather than the PRO itself. In Icelandic, case-attraction is usually optional, especially from Quirky controllers (and for many speakers, basically impossible):

(16) Ég skipaði þeim   að vera hæfir/hæfum
      I   ordered them(D) to be   well-behaved(N/D)

The problem is that if Quirkiness is just another feature, being manifested by agreement, why doesn't it ever get transmitted by case-attraction, producing an N.Nt (*hæft* in (16))? If Quirky case itself never got transmitted, it would be understandable why Quirkiness itself isn't, but this is not the case, specially for secondary predicates, for which case-attraction must usually be obligatory under the PRO analysis.

An arguably worse problem arises with certain predicates that impose Quirky dative on an argument which they also set as controller/understood subject of an adjectival complement (Andrews, 1990a):

(17) a. Þeir lýstu   glæpamanninum   sem stórhættulegum
          They described the criminal(D.M.SG) as   very dangerous(D.M.SG)

      b. Hann heldur tönnunum sínum   hvítum   og hreinum
          He   keeps teeth   his(D.PL) white(D.PL) and clean(D.PL)

In LFG, these would appear to be functional control constructions,[11] requiring a control equation that sets that inner layer of the dative object NP as the SUBJ-value of the complement.[12]

Under the two-layer hypothesis, this leads to a rather interesting prediction, which is that Quirky subjects, even dative ones, will not be able to appear in the complement. This appears to be the case:[13]

(18) a. Glæpamanninum var (mjög) hlýtt til   fjölskyldunnar
          criminal-the(D)   was (very) warm towards the family
          The criminal was (very) warm towards his family

---

[11]Which predicts that nominative in the complement should be impossible; I don't know whether this is actually the case.

[12]Note that, under the QSH, the situation here is similar to that with predicates taking 'Raising into prepositional object position' in Modern Irish, as described by McCloskey (1983).

[13]Of nine respondents to a questionnaire distributed for me in 1986 by Höskuldur Þráinsson, 7 found (b) completely ungrammatical, one a bit unnatural, and one doubtful. Other similar examples making the same point produced similar results.

b. *Þeir lýstu glæpamanninum sem (mjög) hlýtt til
They described criminal-the(D) as (very) warm towards
fjölskyldunnar
the family
They described the criminal as (very) warm towards his family

(a) illustrates a dative subject adjective, (b) that it can't be complement of a dative-controller verb.

This phenomenon is not expected from alternatives to the two-level hypothesis. For example, if Quirkiness consists in having a particular value for some feature, we don't expect a problem when this feature is required on both the controller and the controllee, but that's what we see in (18). A more sophisticated account that has the same problem is the HPSG analysis of Sag et al (1992). Here, 'Quirkiness' consists in having non-equated values for two features, CASE, which is morphologically spelled out, and DCASE (default/'structural') case, which is not (unless it is equated to CASE). There is no reason why lacking an equation between these attributes should cause a unification to fail, so this analysis doesn't explain (18) (and also makes no attempt to deal with any of the effects of Quirkiness on agreement).

Andrews (1990a) didn't draw strong conclusions from the phenomenon of (18), apparently not being sure that the expressions were actually AP that would be generated as complements in these constructions. But in retrospect, this would appear to be an excessively tentative conclusion: 20 years have gone by during which apparent adjectives with QC subjects have been written about by many people, especially Sigurðsson, and nobody has ever suggested that they not adjectives.

1.4 Issues of Stipulation

So we have some phenomena for which the two-layer hypothesis seems to offer a better account than various alternatives, but the A82/90 analysis nevertheless faces a number of problems of excess stipulation. One of these we have already mentioned, the need for person/number features to be specified with constraining rather than defining equations, to keep them from being dumped freely into the upper layers of the Quirky NPs.

Another problem arises with anaphoric control/PRO. A82 relied on Bresnan's 1982 rule of 'anaphoric control' to produce the f-structure for the non-overt subject here, but there is a problem in that the structure of a Quirky NP is rather complicated, involving a substructure whose attribute is the same as the value of CASE in its value, and with gender and number values to boot. In order to produce these structures, A82 needed an ad-hoc elaboration of either the anaphoric control rule, or the rules producing *að* infinitives; neither approach is fully satisfactory,[14] because it needs to

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[14]Note that the elaborations required to produce the agreement features will be required for many

recapitulate the kind of structure found in the independent lexical entries of pronouns.

What we actually want is something that can produce these structures automatically, but also give them the somewhat degraded acceptability that they seem to have (see Andrews (1990a) for one study; Barðdal (2006) for much more extensive investigations).

A final issue is the complexity of the rules that A82/90 uses to produce the Quirky NP structures, slightly different in the two versions, but excessive in either.

We will show next that adding LFG's 'glue semantics' to the analysis in a particular way permits progress with these issues, as well as of course attaining the inherently desirable goal of connecting the complexities of Icelandic case-marking and agreement to semantic interpretation in a formally precise way.

2   A version of LFG+glue

In the original conception of Glue semantic (Dalrymple, 1999), annotations in lexical entries would specify a semantic assembly in parallel with an f-structure. But Andrews (2007a, 2008) finds certain problems with this approach, and further issues arise when we find some reason to supply at a more abstract level of structure something that is missing from the overt form, for the reason that we are likely to have to postulate two mechanisms to build the abstract structure, one for the case where the usual surface support is present, the other for when it isn't. This is exactly what happens in Andrews (1982a) for anaphoric control versus an overt NP. We can address this problem by modifying the architecture so as to use glue's inherent ability to function as a 'generative' level, in the sense of Pullum and Scholz (2001) similarly to and together with phrase structure.

2.1   Co-generative Glue

Glue can function as a 'generative' level because it is based on a notion of linear logic proof (able to appear in a number of different looking guises) that satisfies some reasonably strong constraints of its own, with the result that, given a collection of 'meaning constructors', the lexical specifications of meanings in glue, there are a limited number of ways in which they can be put together to produce a semantically coherent result. Conventional glue makes no explicit use of this possibility (especially if the proposal of Kuhn (2001) to retire the Completeness and Coherence constraint is not adopted), but Andrews (2007a, 2008, 2010) proposes (in somewhat different forms) a variant glue architecture that does.

The motivation behind Andrews (2007a) was to find a version of glue semantics that would work for OT-LFG, which seemed to be conceptualized as a system of principles for choosing between alternative expressions of some f-structure, which was taken to represent the meaning (Kuhn, 2003). But it wasn't at all clear how any such thing

more languages than Icelandic, such as, for example, Ancient Greek (Andrews 1971, Quicoli 1982).

could actually work in concert with traditional glue, where the meaning is constructed on the basis of the meaning-constructors introduced by the lexical items used in the overt form. The proposed modification was to have the f-structure be the main basis on which the meaning-constructors were introduced, by means of a 'Semantic Lexicon' that would pair descriptions of (pieces of) f-structures with pieces of meaning. An f-structure with appropriately assembled meanings could then provide a basis for OT-LFG to use as an input.[15] This treatment turned out to have some desirable properties missing from the standard one, especially in explaining the fact that most grammatical features do one of the following two things (or both, varying with the circumstances):

(19) a. Take one of a number of interpretations provided by the grammar, on their own (e.g. NUM PL signifying semantic plurality, or GEND FEM on a pronoun, signaling female sex).

b. Take an 'idiomatic' interpretation jointly with a specific lexical item (e.g. *pluralia tantum*, grammatical gender with most common nouns).

Although conceived to support OT-LFG, the notion of a Semantic Lexicon producing pairings of a semantic assembly and an f-structure[16] can also function in a non-OT LFG architecture, where c-structure rules and a second lexicon, which we can call the 'Morphological Lexicon', produce an f-structure in essentially the usual manner, although with significant differences in the details of what is produced, due to the difference in environment, especially the changed role of PRED-features. A full sentence structure then consists of a c-structure and a semantic assembly, each with their associated f-structure, subject to the requirement that the two f-structures match 'closely enough' (whatever this turns out to amount to). This version of the idea is presented in Andrews (2008), and is close to what will be used here.
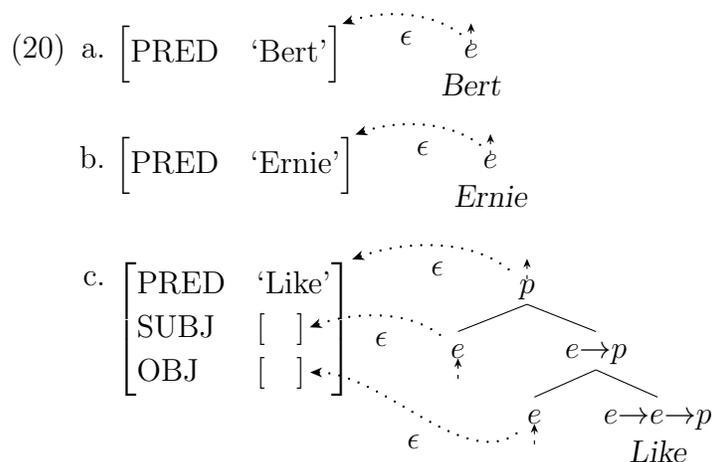
For reasons of accessibility rather than substance, I will also use the 'prefab/propositional' version of glue presented in **?**, and in a somewhat more relaxed manner, Andrews (2012). In this presentation, the glue proof is assembled from 'prefab pieces' that mostly look like parts of an ordinary-looking semantic structure presented in the lambda-calculus, and can be assembled by intuitively straightforward rules, only sketched here.

In this approach, we can present a Semantic Lexicon Entry (SLE), as a pairing between a 'piece of meaning' presented as a glue prefab, and a piece of f-structure, or a description of such a piece (a distinction which is conceptually important in LFG, but which one can often get away with ignoring). These two components are related by a correspondence that I will call ϵ (for 'expresses'), similar in spirit to the LFG's ϕ correspondence (Kaplan, 1995), running from the atomic type nodes in the glue prefab to the substructures in the f-structure: Some examples are:

---

[15]Unbeknownst to Andrews at the time, the glue implementation in the XLE LFG system also worked directly off f-structure, but for computationally pragmatic rather than theoretically motivated reasons (Richard Crouch, p.c.).

[16]Or, more generally, an f-description perhaps also including some constraints applying to c-structure via the 'inverse projection' concept of Kaplan (1995).

(20) a. $\begin{bmatrix} \text{PRED} & \text{'Bert'} \end{bmatrix}$ ϵ $\hat{e}$
                                                              Bert

   b. $\begin{bmatrix} \text{PRED} & \text{'Ernie'} \end{bmatrix}$ ϵ $\hat{e}$
                                                               Ernie

   c. $\begin{bmatrix} \text{PRED} & \text{'Like'} \\ \text{SUBJ} & [\ \ ] \\ \text{OBJ} & [\ \ ] \end{bmatrix}$

ϵ $\hat{p}$
ϵ $\hat{e}$ $e{\rightarrow}p$
              $\hat{e}$ $e{\rightarrow}e{\rightarrow}p$
       ϵ *Like*

The node-labels represent semantic types, which can be thought of as the semantic types of nodes in a phrasally organized expression. The atomic types have arrows going in or out, the inbound arrows representing argument positions, output arrows the results to be plugged into to argument positions, or returned as the final result of assembly.

People familiar with standard glue will note that the SLEs combine the information provided by 'meaning-constructors' (the grammatical functions associated with the arguments) with other information provided by the lexical entry a meaning-constructor appears in (the grammatical feature-values, especially PRED). People familiar with Construction Grammar might also observe that the f-structure side is very similar in appearance to a lexical construction,

To effect assembly, what we're going to do is take a collection of SLEs, taking multiple copies of any that we want to use more than once, and then assemble their typed meanings, if possible. This assembly will then determine an f-structure/description, which will be the semantically generated f-structure. There may of course be no legitimate assembly (in which one might say that the attempted 'semantic computation' crashes), or more than one, yielding ambiguity of the kind often found with quantifier scope, when there doesn't appear to be an ambiguity of conventionally motivated syntactic structure. The selection step would appear to be essentially the same thing as forming a Numeration in the MP.

The assembly step however is not very much like the Minimalist computation, because it is much simpler, since most of the work that is done by the Minimalist computation gets done by other components in the present approach. The main constraints are:

(21) a. Each node with an inbound arrow must have a single outbound arrow plugged into it.

   b. Every node with an outbound arrow must have that plugged into a unique inbound arrow, except for one, of propositional type associated with the f-structure of the whole sentence

c. The semantic types of plugged nodes must be the same.

Assembling according to these rules yields a semantic structure whose atomic type-nodes correspond to pieces of f-structure, or, more formally, f-descriptions. For example:

(22)
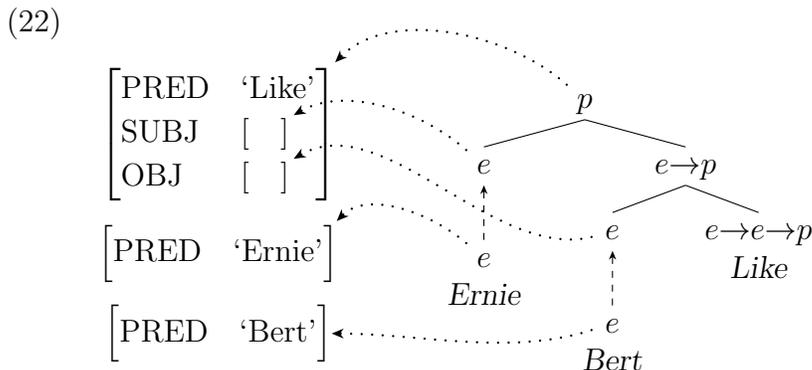
Suppose now that the semantic nodes connected by the dashed arrows are to be regarded as actually the same node, and that the relationship designated by the dotted lines has to be a function, that is, single-valued on the pairs of nodes connected by the dashed lines. Then the destinations of the dotted arrows will have to be merged, and the result will be the assembly of the pieces into a single f-structure:[17]

(23)
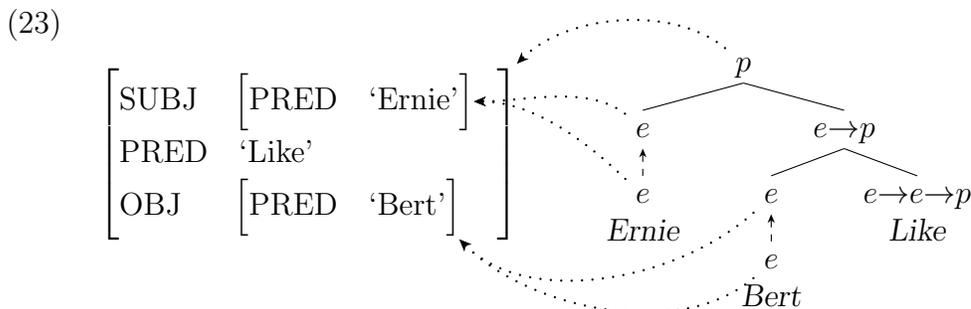
This is conceptually very similar to how an annotated phrase-structure grammar associates an f-structure with a tree, and the similarity is especially apparent if we formulate the f-structural specifications as f-descriptions.

But there is a very important difference in detail, which is that in building the meaning-based f-structure, feature-values cannot be allowed to merge (there might be marked exceptions to this, for certain kinds of haplology and 'multiple agreement'). The necessity for this can be seen by considering what could be done with an SLE like this

---

[17]Andrews (2007a) gives a clumsier description of what this process is supposed to achieve, while Andrews (2008, 2010) describes a reverse version, which starts with the f-structure and using SLE's to build the semantic structure. It would be good to have a proof that both define the same association between meaning assemblies and f-structures, for a given collection of SLEs, but this isn't necessary for the present analysis of Icelandic.

(leaving the semantic specification in its 'unexpanded' form, as a semantic type expression with a symbol representing its actual meaning):

(24)
$$\left[\text{POLARITY} \quad \text{NEG}\right] \quad \Leftrightarrow \quad \textit{Not} : p{\to}p$$

The problem is that if merger of feature-values was allowed, we could choose this twice somewhere where both POLARITY-values would appear at a single level of the f-structure, and thereby produce a single f-structure with one negative feature, but two instances of the operator in the semantics, an undesired effect (which would, for example, allow confessions to be packaged as denials). This can be blocked by not allowing feature-values to merge when an f-structure is being produced from the semantics (whereas, allowing this when one is being produced from the c-structure is essential to the LFG treatment of agreement).

We now have a notion of well-formed pairing of f-structures with meanings relative to a collection of SLEs, delivering the concept we need of a semantically generated (or interpreted) f-structure. To get a full sentence structure, we first use a regular LFG to connect a c-structure to an f-structure, thereby producing a c-structurally generated f-structure. The final step is to decide how closely the two f-structures need to match.

Two criteria are rather plausible:

(25) a. The two f-structures should not disagree on the value of any attribute

b. The c-structurally generated f-structure should not provide a value for any 'interpretable' attribute that the semantically generated one doesn't (more on 'uninterpretable' features such as, in particular, CASE, later).

The motivation for these principles is for example that if the c-structure and lexical items put, say, a plural feature on the f-structure of an NP, that feature will also have to be interpreted in the semantics, and can't just be ignored (if it's *pluralia tantum*, it is being jointly interpreted with its lexical stem, as discussed below).

These principles prevent the c-structurally generated f-structure from producing material not provided by the semantically generated one, but so far impose no constraints in the other direction. Having no constraints would be equivalent to allowing any amount of semantically produced structure to associate with an given amount of overt structure that doesn't contradict it, which would clearly be going too far (in effect, no 'recoverability of deletion'). A reasonable first proposal would be an adaptation of Panini's blocking principle to the general effect that a pairing of c-structure and semantically produced f-structures is blocked if the grammar provides another one that whose c-structurally produced f- structure matches more of the semantically produced one. This would be equivalent to an OT-style application of a MAX-constraint.

But languages plausibly differ in what kinds of features they allow to be unexpressed at all. In Ancient Greek, for example, one can make a case that the finite irrealis moods (subjunctive and optative) require their mood features to be expressed overtly in the morphology: the person-marked perfect passive-middle forms, in which the position in which the irrealis markers occur is absent form the morphological template, cannot be used in these irrealis moods, and a periphrastic construction consisting of a participle and irrealis finite copula must be used instead. In effect, something seems to make the 'externalization' of the mood marker obligatory here. Similarly, Barðdal (2006) cites evidence by Bayer et al (2001) that dative case must be morphologically expressed in German.

Variations in the kinds of PRO- (and pro-) drop that are allowed in different languages can therefore be treated as variations in what kinds of pronominal and other features need to be expressed in the syntactically generated f-structure, and under what circumstances. In principle, constraints governing this could be combined with standard LFG's rule of Anaphoric Control, but the present approach gives us a more uniform mechanism, and furthermore one in which it is more natural to think about properties involving the entire structure.

2.2   The Role of PRED

Although this modified architecture is, I think, similar enough to the original LFG to count as a version of LFG, the introduction of glue, especially in the way done here, motivates some substantial changes, especially in the treatment of PRED-features. In Classic LFG, these were where meanings of open-class lexical items were encoded (and perhaps meanings of some closed-class items as well, such as prepositions), and also where subcategorization was expressed, by means of 'argument-lists' of 'governed grammatical functions'.[18] But once meaning-constructors are available, the role of PRED-features becomes less clear, especially because, as first discussed by Kuhn (2001), the glue assembly principles dcan o the basic work of the 'Completeness' and 'Coherence' constraints that implement subcategorization for LFG, in conjunction with the argument-lists. This makes it sensible to wonder whether the PRED-features should be dispensed with. Andrews (2008) considers this question, and concludes that they should be retained, although playing a reduced rule, and in particular without argument lists and the Completeness and Coherence constraints. He furthermore proposes a variety of constraints, which tend to have the effect of requiring PRED-features to appear in various places, including those where they are traditionally found, as well as some additional ones.
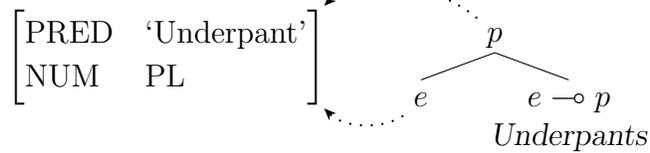
One important idea is that SLE's aren't restricted to mentioning a single feature-value, but can introduce/mention as many as they like, subject to constraints to the general effect that these be 'close enough' to each other, as defined in Andrews (2008). Here,
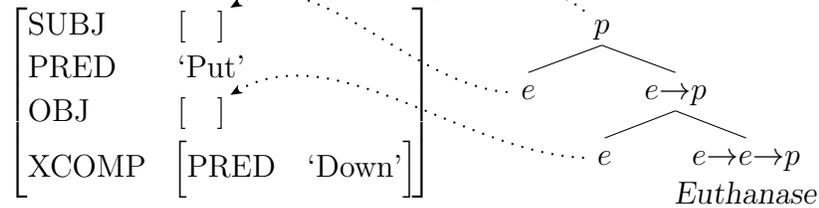
---

[18]Technically, lists of f-structure designators specified in terms of governable grammatical functions.

for example, are SLE's for a typical *pluralia tantum*, a verb-particle combination, and a verb-possessor idiom:
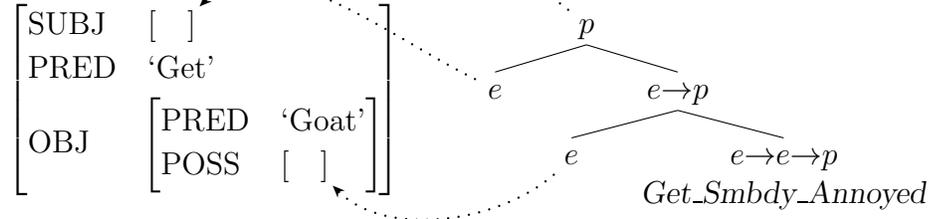
(26) a.

$$\begin{bmatrix} \text{PRED} & \text{`Underpant'} \\ \text{NUM} & \text{PL} \end{bmatrix}$$

$$p$$
$$e \quad e \multimap p$$
Underpants

b.

$$\begin{bmatrix} \text{SUBJ} & [\ ] \\ \text{PRED} & \text{`Put'} \\ \text{OBJ} & [\ ] \\ \text{XCOMP} & [\text{PRED} \quad \text{`Down'}] \end{bmatrix}$$

$$p$$
$$e \qquad e{\rightarrow}p$$
$$e \qquad e{\rightarrow}e{\rightarrow}p$$
Euthanase

c.

$$\begin{bmatrix} \text{SUBJ} & [\ ] \\ \text{PRED} & \text{`Get'} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{`Goat'} \\ \text{POSS} & [\ ] \end{bmatrix} \end{bmatrix}$$

$$p$$
$$e \qquad e{\rightarrow}p$$
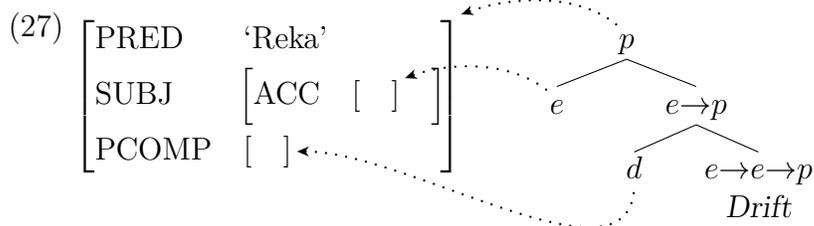$$e \qquad e{\rightarrow}e{\rightarrow}p$$
Get_Smbdy_Annoyed

Note in particular (c), where the 'real' argument appears internally to an f-structure with a co-interpreted PRED-value. This kind of configuration will be essential in our treatement of QC below.
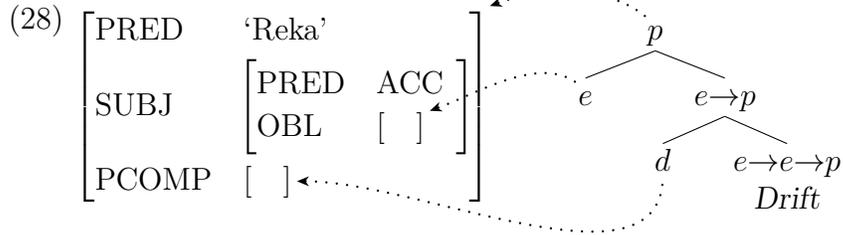
The A82/90 form for Quirky NP structures can be produced by SLEs like this, where I have introduced a type d for 'direction' for the directional complement of *reka* 'drift':

(27)

$$\begin{bmatrix} \text{PRED} & \text{`Reka'} \\ \text{SUBJ} & [\text{ACC} \quad [\ ]] \\ \text{PCOMP} & [\ ] \end{bmatrix}$$

$$p$$
$$e \qquad e{\rightarrow}p$$
$$d \qquad e{\rightarrow}e{\rightarrow}p$$
Drift

This will assemble with nominal meaning constructors in the usual way, but producing f-structures where the SUBJ argument has the two-layer structure.

However, there is an issue of detail to consider here. A82/90 used CASE-values as GF attributes, in emulation of the analysis of 'idiomatic'/oblique argument PPs presented in Kaplan and Bresnan (1982). But this has not proved to be one of the more popular features of LFG, and some issues we will consider below are problematic for it. Furthermore, Andrews (2008) motivates a constraint to the effect that every layer of

structure (at least those that lead to substructures with PRED-features) must have a PRED-feature. This suggests that the Quirky NPs should have a PRED-feature whose values trigger the appearance of the appropriate CASE-value on the inner NP. Using the case name itself as the PRED-value, (27) will then be revised to:

(28)

$$
\begin{bmatrix}
\text{PRED} & \text{'Reka'} \\
\text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{ACC} \\ \text{OBL} & [\ ] \end{bmatrix} \\
\text{PCOMP} & [\ ]
\end{bmatrix}
$$

$$
\begin{array}{c}
p \\
e \qquad e{\to}p \\
d \qquad e{\to}e{\to}p \\
Drift
\end{array}
$$

Observe that we are *not* using the lexical entry to directly specify the CASE-value of the inner layer (although it ultimately does so, indirectly), because doing this would be inconsistent with the account we will eventually propose for what drives Icelandic learners to the two-layer analysis. We will discuss where the CASE-values come from below.

So our proposal about Quirky arguments of verbs is that the verbs have SLEs which specify an extra layer of structure in their f-structures, as illustrated in (28). Exactly why this happens is something we will take up later; what we do next is show how the modified version of LFG+Glue addresses a range of problems with A82/90.

3   Applying Glue

We apply the present version of glue to the problems of producing the 'PRO' subjects for infinitives, avoiding the dumping by agreement morphology of random features into f-structures, and redeeming the promissory notes on semantics issued in A82/90.

3.1   Constructing PRO

In 'lexicalist' treatments since Jackendoff (1972), 'PRO' has been treated essentially as a pronoun subject to some special binding conditions, similar to those imposed on reflexives. Adapting this idea to the present context, pronouns will have SLEs of some kind. There appear to be two kinds of PRO, those with and without overt antecedents:[19]

(29) a. Það væri   hryllileg að vera stungið saklausum   í
        It   would be horrible to be   put   without cause(D.M.SG/D.PL) in
        steininn
        jail.
        It would be horrible to be put in jail without cause.

---

[19]I am indebted to Halldór Sigurðsson for help with these examples.

  b. Ég vonast til   að vera ekki stungið í   steininn
     I   hope   toward to be   not   put   in jail
     I hope to not be put in jail.

The *-um* ending on the adjective in (a) could either be masculine singular, or any gender in the plural (but only dative in case).

In the present framework, for (a), the absolute minimum that the entry for PRO might be able to get away with doing is introduce some PRED-value in the f-structure, and provide type e output in the semantics:

(30)
$$\begin{bmatrix} \text{PRED} & \text{'PRO'} \end{bmatrix} \quad \Leftrightarrow \quad PRO : e$$

PRO here is a convenient representation of the meaning of uncontrolled 'PRO', whatever that happens to be. But in fact, we seem to need a bit more than this.

One of these meanings is the 'unspecified person' meaning of *on* in French, *man* in German, and various so-called 'autonomous' constructions. In such cases, the SLE would also appear to have to introduce a masculine gender feature, since a feminine or neuter form would lack the arbitrary interpretation (Halldór Sigurðsson, pc).

On the other hand it would be possible for a woman to say (31), thinking of herself, and perhaps even for a man to say it to his girlfriend, thinking of her as the potential arrestee:

(31) Það væri   hryllileg að vera stungið saklausri   í   steininn
     It   would be horrible to be   put   without cause(D.F.SG) in jail.
     It would be horrible to be put in jail without cause.

Uncontrolled PRO can be given SLE's of the same general nature as those for overt impersonal and indefinite pronouns, in particular, involving gender and number features in the same way as these do. This eliminates the problem of standard LFG in doing these both in pronoun lexical entries and the rule of Anaphoric Control.

For controlled PRO, we need to include some treatment of anaphora, such as the 'tensor'-based analysis of Asudeh (2004). Space limitations preclude going through the semantic details here, but note that just as in the case of uncontrolled PRO, controlled PRO will involve SLEs that manage gender and number agreement features in the same way as overt pronouns. A sample SLE is:

(32)

$$\text{ANT} \left\{ \begin{array}{l} \begin{bmatrix} \text{GEND} & \alpha \\ \text{CASE} & \beta \\ \text{GEND} & \gamma \end{bmatrix} \\ \\ \begin{bmatrix} \text{GEND} & \alpha \\ \text{CASE} & \beta \\ \text{GEND} & \gamma \\ \text{PRED} & \text{'PRO'} \end{bmatrix} \end{array} \right. \Leftrightarrow \quad \lambda x.[x,x] : e \rightarrow e \otimes e$$

What this SLE does is in effect 'borrow' the content of the antecedent, and make a copy, returning the original to the antecedent position, and making the copy available at the PRO(noun) position. The $\otimes$ symbol combines the conceptually two outputs into a formally single one; see Asudeh (2004) and **?** for more discussion. In the mathematically proper f-descriptional formulation, the Greek letter variables are replaced by the obvious equations. We'll suggest a way to simplify this later.

The SLEs and semantic assembly principles will then be able to produce f-structures like this (semantic structure omitted), where the italicization of the CASE-value signals that we haven't yet said how it gets there:

(33)

$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{DAT} \\ \\ \text{OBL} & \begin{bmatrix} \text{PRED} & \text{'PRO'} \\ \text{CASE} & \textit{DAT} \\ \text{GEND} & \text{X} \\ (\text{NUM} & \text{PL}) \end{bmatrix} \end{bmatrix} \\ \text{PRED} & \text{'Stungi}\eth_{Pass}\text{'} \\ \text{PCOMP} & [\dots] \end{bmatrix}$$

Gender and number are here left open, so as to suit the various interpretative possibilities, and we're not explaining where passive PRED-values come from either.

In the full sentence-structure of a QC subject $a\eth$-infinitive, none of the features in the SUBJ-value get overtly realized, i.e. matched by anything in the c-structurally generated f-structure (but everything else does). On the one hand, this has to be possible to allow for these examples, on the other, it does appear to produce some degradation of acceptability. Since the various SLEs involved could reasonably be supposed to differ in how tolerant they are of having their f-structure features go unmatched, there is substantial scope for the kinds of complexities in the data to arise that are found by Barðdal (2006). It remains to be seen how good an account of the details of the complexities can be gotten out of this treatment.

And a pleasant side-effect of this approach is that the c-structure rules for Quirky NP can also be simplified. All we need to do as add to the regular NP rule this additional expansion:
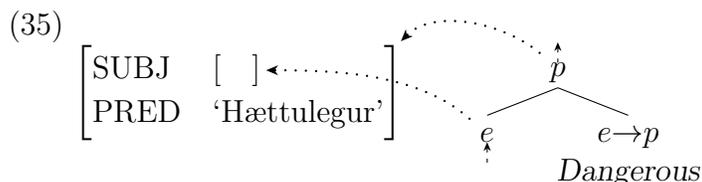
(34) NP   →   NP
                          $(\uparrow \text{OBL}) = \downarrow$

We don't need the extra bar level found in A82/90, since the semantic f-structure generation will prevent (34) from effectively recursing, and we especially don't need the unpopular $(\uparrow (\downarrow \text{CASE})) = \downarrow$ annotation, since the SLEs for the Quirky verbs can introduce the PRED-values for the extra layer, without requiring any involvement of the c-structure rules. In addition to being simpler, this treatment is much more compatible with the reduction of phrase-structure annotations to general principles that is developed in Bresnan (2001).

A problem that this approach does not address is to explain why nonfinite subjects are such a popular locus for unexpressed pronouns. The classic explanation for this in GB was the 'PRO-theorem', but nobody has ever managed to make this work out for Icelandic, including in treatments such as Jónsson (1996), where the Case Filter is used with a reasonable degree of success to control movement. See Boboljik and Wurmbrand (2008) for recent discussion. We will therefore have to leave this as an unsolved problem, suggesting that it has something to do with the prominence relations between the core grammatical functions, whereby SUBJ is most highly ranked.
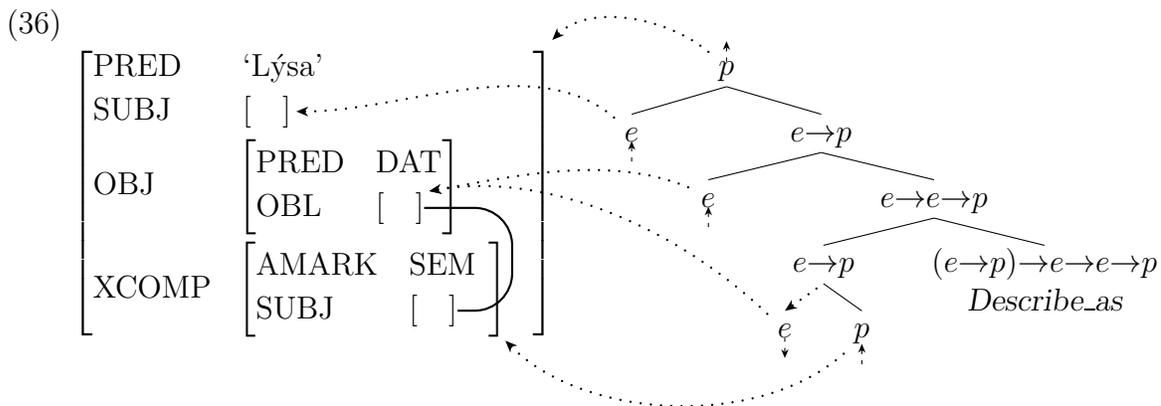
3.2   Redeeming Promissory Notes

Now we redeem the promissory notes issued in A82/90 about using semantics to explain why some kinds of agreement with QC NPs work while others don't. We look at Quirky NP-controlled complements, since the other instances are effectively dealt with in the literature. The complements with which these constructions occur are ordinary NPs, taking non-Quirky subjects, whose SLEs would therefore take input from the upper layer of a subject's NP's f-structure:

(35)

$$\begin{bmatrix} \text{SUBJ} & [\ \ ] \\ \text{PRED} & \text{'Hættulegur'} \end{bmatrix}$$

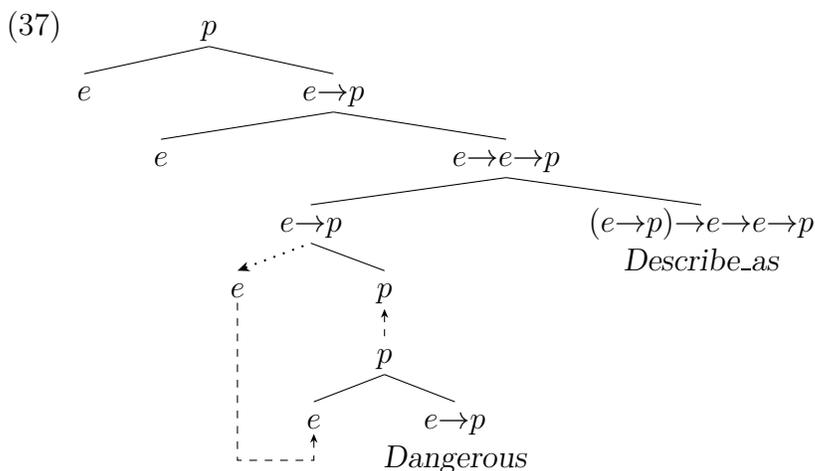$\overset{*}{p}$

$e \qquad e{\rightarrow}p$

Dangerous

A verb such as *lýsa sem* on the other hand would probably best be treated as involving functional control by a theta-role bearer, as analysed by Asudeh (2005). In terms of our diagrams, this requires a semantic configuration we haven't seen before, a 'complex argument' of type $e{\rightarrow}p$ (technically, a 'positive polarity implication', as discussed in

?). In (36) below, the right daughter, connected to its mother by a dotted arrow, is an output node, which effectively functions as a variable binder, and there is a constraint that the 'dynamic path' (constituted by the solid lines in the semantic prefabs, oriented upwards, and that dashed links added for assembly, oriented in the direction of their arrows) that starts at that daughter must feed back through its left sister. The SLE is:

(36)

$$
\begin{bmatrix}
\text{PRED} & \text{'Lýsa'} \\
\text{SUBJ} & [\ ] \\
\text{OBJ} & \begin{bmatrix} \text{PRED} & \text{DAT} \\ \text{OBL} & [\ ] \end{bmatrix} \\
\text{XCOMP} & \begin{bmatrix} \text{AMARK} & \text{SEM} \\ \text{SUBJ} & [\ ] \end{bmatrix}
\end{bmatrix}
$$

p

$e \qquad e{\to}p$

$e \qquad\qquad e{\to}e{\to}p$

$e{\to}p \qquad (e{\to}p){\to}e{\to}e{\to}p$

$e \quad p \qquad\qquad\qquad Describe\_as$

The Quirky object's inner layer and the complement subject are equated by functional control, so it doesn't matter which of these two the associated e's in the semantic structure get connected to. There are some surprises in the treatment of this kind of structure, discussed in Andrews (2007b), but they're not relevant here.
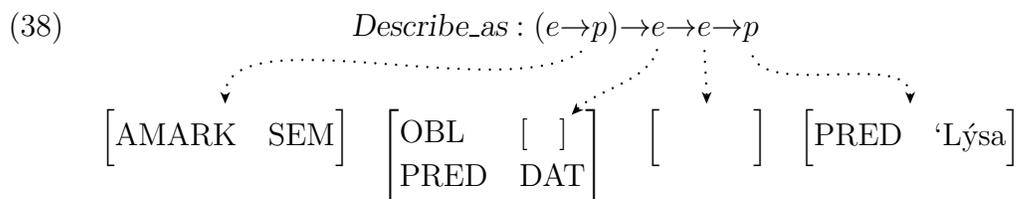
To assemble (36) and (35), we need to feed the subordinate output e of (36) into the input e of (35), and the output p of the latter into the input p of (36), producing this:

(37)

p

$e \qquad\qquad e{\to}p$

$e \qquad\qquad\qquad e{\to}e{\to}p$

$e{\to}p \qquad\qquad\qquad (e{\to}p){\to}e{\to}e{\to}p$

$e \qquad p \qquad\qquad\qquad\qquad Describe\_as$

p

$e \qquad e{\to}p$

$Dangerous$

The key point is that if the complement subject isn't equated with the inner layer of the matrix Quirky dative object, then the assembly can't go through, since the 'output e' of the complex argument of *lýsa sem* can't match up with the input e of *hættulegur*,

with the result that the structure can't be interpreted. And it should also be evident that if the complement adjective itself requires a two-layer subject, then no workable assembly can be produced with the SLEs at hand.

A reasonable complaint about (36) would be that it is rather complex to be part of a project whose goal is to reduce stipulation. Fortunately, the LFG literature suggests a variety of principles whereby (37) might be produced from a more reduced form of specification, such as perhaps this:

(38)
$$Describe\_as : (e{\to}p){\to}e{\to}e{\to}p$$

$$\begin{bmatrix} \text{AMARK} & \text{SEM} \end{bmatrix} \quad \begin{bmatrix} \text{OBL} & [\ ] \\ \text{PRED} & \text{DAT} \end{bmatrix} \quad \begin{bmatrix}\ & \ \end{bmatrix} \quad \begin{bmatrix} \text{PRED} & \text{'Lýsa} \end{bmatrix}$$

(38) states only easily observable properties of the lexical item; Andrews (2007b) discusses issues relevant to expanding it to a full SLE, drawing heavily on LFG argument-structure.

The remaining cases of agreement with Quirky NPs are floating quantifiers and circumstantial predicates, which I won't develop explicitly here, but refer to analysis in Andrews (2007b) for floating quantifiers (in Catalan), and Haug (2008) for XADJUNCT secondary predicates. Neither of these analyses deal with Icelandic, but both would require that the agreeing elements get access to inner layer of a two-layer in order for interpretation to go through, for the same reason as the *lýsa sem* construction. And no plausible mechanism exists whereby Quirkiness could be transmitted by case-attraction.

3.3   Suppressing Dumping

The last problem we'll consider is how the proposal suppresses random dumping of feature-values by agreement markers. The basic reason is that so-dumped features will not normally be able to get a semantic interpretation. To show this in detail for NUM(ber), we need to push glue analysis into the basics of NP structure. Glue has so far accepted the standard Formal Semantics idea that noun, like adjectives and intransitive verbs, are of type $e{\to}p$. As discussed in some detail in Dalrymple (2001) and Andrews (**?**, 2010),[20] common nouns can be analysed as taking an e-type argument located at their f-structure correspondent, and returning a p-type result there (structurally more complex possibilities, involving for example referential indexes, are also possible). Quantifiers, etc, then pick put up the 'property' so-produced, and integrate it with the rest of the sentence- meaning.

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[20]There are some technical differences between the treatments of Dalrymple and Andrews, but they don't matter here.

On such an approach, the obvious thing to do with plurals is to follow Link (1998) and treat their number features as introducing operators that convert a property $e{\rightarrow}p$ of singular count entities into a property of type $e{\rightarrow}p$ of 'plural' entities (non-atomic *i*-sums). That is, *boy* is a predicate that is true or false of individual entities, *boys* of certain kinds of collections of entities (i-sums, in Link's terminology). SLE's for a plural feature and a noun would then look more or less like this:

(39) a. $\Big[\text{NUM} \quad \text{PL}\Big] \quad \Leftrightarrow \quad Pl : (e{\rightarrow}p){\rightarrow}e{\rightarrow}p$

   b. $\Big[\text{PRED} \quad \text{'Boy'}\Big] \quad \Leftrightarrow \quad Pl : e{\rightarrow}p$

(Since all the semantics-f-structure links go to the same place, they are omitted here.) SLEs like these can happily assemble to produce results like this (see the literature for the details):

(40) $\begin{bmatrix} \text{PRED} & \text{'Boy'} \\ \text{NUM} & \text{PL} \end{bmatrix} \quad \Leftrightarrow \quad PL(Boy) : e{\rightarrow}p$

But assembly won't produce acceptable results if PL-values are dumped into the upper-levels of Quirky NPs, since, in such places, their meanings can't integrate properly with anything else. Therefore, unless something special happens, principle (25b) will block agreement from dumping features into these positions, since such features won't be matched by the semantically generated structure.

We can tell a similar story for gender, but with the difference is that gender is normally co-interpreted with a PRED-value (especially in Icelandic, where the connection between grammatical gender and real world sex appears to be unusually weak for a European language), by SLEs that look like this:

(41) $\begin{bmatrix} \text{PRED} & \text{'Strákur'} \\ \text{GEND} & \text{MASC} \end{bmatrix} \quad \Leftrightarrow \quad Boy : e{\rightarrow}p$

As with number, a randomly dumped gender feature won't wind up matching anything produced by the semantics, under normal circumstances, and so will be blocked by (25b).

There is of course one kind of feature-value for which this kind of story won't work at all, namely, structural case, since this is a kind of feature which appears to have no semantic interpretation, but rather appears to be a relatively pure reflection of the syntax. This requires an additional mechanism beyond the glue semantic interpretation scheme for 'licensing' attributes in the f-structure.

4   Case Marking Rules

Given the extent to which analysis of languages with rich case-marking systems has provided motivation for LFG, it is surprising how difficult it has been to come up with a stable and widely agreed on account of how 'structural' case works, that is, case-marking that appears to be strongly linked to the syntactic position of an NP, rather than to its semantic role as such. To see the variety of early proposals, compare the rather different treatments of Icelandic (Andrews, 1982a), Russian (Neidle 1982a, 1988), Malayalam (Mohanan, 1982) and Warlpiri (Simpson, 1983, 1991). In the first subsection we will propose an account of structural case, a modified version of the treatment of Nordlinger (1998). In the second, we will extend it to Quirky and one kind of 'Semantic' case.

4.1   Structural Case

Nordlinger's treatment can be regarded as an extremely direct implementation of the traditional idea that the primary function of case is to mark the grammatical function of the NP that the case appears on. It is implemented with the formal mechanism of 'inside out functional uncertainty' (iofu) presented in Dalrymple (1993), whereby an f-description can require the existence of paths leading up from a given f-structure as well as down, and impose constraints on what must be found at the end of these paths. An iofu path is written by putting an f-structure designator in the rightmost rather than the leftmost position of a parenthesized sequence, preceded by a sequence of GF labels. E.g. (SUBJ↑). The interpretation is that there must be an f-structure from which the described path ends at the f-structure designated by the f-structure designator at the end of the iofu expression, and this f-structure can be regarded as 'nondeterministically designated' by the iofu expression (since the f-structure at the top of the path might not be uniquely determined), so that additional requirements can be imposed by using the iofu designator in larger f-structure designators. E.g. ((SUBJ↑) TENSE) is interpreted as a constraint that ↑ must be the subject of something that has a TENSE-value, a good first account of the distributional condition for the nominative case in English, Irish, Latin and Ancient Greek.

The simplest kind of case-distribution would simply specify that something appear at the end of a given path, and a specification such as (OBJ↑) for the accusative case in Russian (Neidle 1982b, 1988) is an example (which would need elaborations to deal with coordinate structures, etc). But more than just an iofu path seems normally to be found, such as a finiteness requirement for nominative on subjects (in many but not all languages; Icelandic being a significant exception) noted above. The 'genitive of negation' in Russian and Polish would be another plausible example, expressible with the constraint ((OBJ↑) POL −) (alternating freely with the accusative in Russian, blocking it in Polish). Note that, since the genitive of negation does not serve as a substitute for the actual negator, this f-description must be taken as a constraining rather than a defining specification.

We can now formulate a very simple ergative case distribution as '((SUBJ↑) OBJ)', which means '↑ (my f-structure location) is the value of SUBJ in a structure that also has an OBJ-value'. Unfortunately, actual ergative case forms in languages seem to appear under a much wider range of conditions than mere presence of an OBJ, as is well-known from the literature. In Warlpiri, for example, there is a small class of intransitive verbs of bodily function that take the ergative (Hale, 1982), unaccounted for in the theory of 'case competitors' proposed in Bittner and Hale (1996b, 1996a). Therefore, in addition to the commonly encountered tense and aspectual, etc. conditions on ergative case-marking (easily accommodated by adding restrictions involving specifications of semantically interpreted clause-level TAMP features, similar to what we proposed above for the genitive and negation in Russian), it seems to be necessary to allow additional verbal properties of a still unclear nature to be referred to by ergative case constraints (that they have something to do with argument-structure is the obvious guess).

So far so good, but then a problem arises, which is that in standard LFG architecture, there's no reason why the lexical items of morphological forms shouldn't just introduce the iofu specifications without the CASE-values which they are traditionally supposed to be associated with. For example, why shouldn't an ergatively case-marked nominal just carry an ergative iofu specification, rather than also introducing a traditional CASE-setting equation like this:

(42) $(\uparrow CASE) = ERG$

If there was no evidence that CASE-features existed, this would not be a problem: we could just drop them from the analysis, as a tradition revealed to be a mistake.

But there is such evidence. One indication is the kinds of interactions that sometimes occur between case and agreement. In Hindi, for example, verbs can only agree with a traditional nominative NP. If the subject is nominative, the verb agrees with that, otherwise with the object if this is nominative, otherwise with nothing. It is formally routine for an agreement marker to require the presence of a particular CASE-value on the agreement target,[21] such as, in this case 'NOM', but it is hard to see how, in LFG, the presence of an iofu specification on one of the lexical components of the target would have any such effect, if something like a CASE-value wasn't also present.

A more subtle indication can be gotten from the well-known fact that the usage of the traditional case forms in languages is quite varied, in spite of the tendency to re-use names such as 'nominative', 'ergative', 'dative', etc. across different languages. Furthermore, single traditional case-forms, such as 'accusative', tend to have multiple traditionally recognized uses in any given language. So Icelandic accusative forms can be structural, quirky, or to a limited extent, semantic (see Sigurðsson (2003) for a very

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[21]More likely, in this case, is that what is required is no CASE-value at all on the target, since traditional 'nominative' in Hindi/Urdu is plausibly analysed as a 'default' case implemented by the absence of any CASE-value.

extensive survey of uses of Icelandic case forms).

Suppose without CASE-features, but only statements similar to (42) directly connecting the morphological forms to their conditions of use. We then might expect to find different parts of speech, such as Noun, Adjective and Determiner, making radically different choices as to what kinds of distinctions their case-forms marked, since they would require different iofu paths (those for adjectives starting with (ADJUNCTS $\epsilon\uparrow$), for example), and so might perfectly well specify different circumstances overall. But this isn't what normally happens: if agreement happens at all, one typically finds either the full inventory of distinctions, or a substantial reduction (along the lines of 'direct' vs. 'oblique'), but not just something randomly different. This is just what we expect if agreement is marking or recapitulation of the value of a feature such as CASE, with a limited range of values.[22]

We can produce this behavior by stipulating the following properties in the architecture:

(43) a. Morphological lexicon entries cannot introduce iofu paths directly.

   b. Certain attributes, such as in particular CASE, do not require semantic interpretation, but are a separate mechanism, in which Nordlinger's iofu constraints is a major ingredient.

In a language where nominative case really is strongly associated with finite verbs, we might for example have a constraint like this:[23]

$$(44) \quad \begin{bmatrix} \text{CASE} & \text{NOM} \end{bmatrix} \ : \ ((\text{SUBJ}\uparrow)\ \text{TENSE})$$

There are a number of ways in which a rule of this form could be construed as applying. A simple way to integrate them into the proposed LFG architecture is to have them add additional features to the semantically generated f-structure, which then have to be matched by the morphologically generated one in the same way as the semantically interpreted features do.

Functioning as a feature-addition rule, (44) falls into the class of 'Schönfinkel-Bernays' conditionals described by Johnson (1991), which have a somewhat degrading effect on computational complexity, but don't render LFG-type grammars undecidable, because

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[22]A limited kind of partial exception is 'mixed ergativity', where some kinds of nominals mark ergative case, others accusative (and often, some both). Under the well-motivated analysis of Goddard (1982), this involves different realization patterns for features that are always present. What would falsify Goddard's proposal would be different kinds of nominals showing slightly different environments for spelling out ergative case, but this doesn't appear to happen.

[23]The are other possible notations that one might use here, such as putting CASE on the right in the iofu path, instead of on the left in square brackets; the reason for the present choice is my judgement of intuitive accessibility.

the rules merely tack on additional structures chosen from a finite number of possibilities onto a predetermined and finite number of locations, without producing the possibility of infinitely iterative application. We can use such rules to add some CASE-features to the semantically generated f-structure, and then try to match this up with a c-structurally driven one in the usual way. An issue that arises immediately is whether such rules can apply in sequence, so that one can produce features that are referred to in the environment of the next, or only in parallel: the latter choice is clearly both more restrictive and computationally pleasant, as well has perhaps capturing at least part of the intuition in some recent GB/Minimalist work that case and agreement are 'post syntactic'.

So now we can propose a rule for the accusative. In A82, being an object or second object of something that had a PRED-value for SUBJ was the condition for the Icelandic accusative, and the proposal of A90 can be regarded as a variant of this. Such a formulation accounts for the fact that verbs with dative subjects have nominative objects, although not for the absence of verbs with accusative subjects and nominative objects (functioning semantically as arguments, rather than complex predicates, as discussed above). A82's proposal can be formulated like this:

(45) $\begin{bmatrix} \text{CASE} & \text{ACC} \end{bmatrix}$: $((\text{OBJ/OBJ2}\uparrow)\,\text{SUBJ PRED})$

But this won't work in our present approach, because in it, the outer layer of a Quirky NP does have a PRED. But there is an obvious replacement the PRED-condition, which is that the SUBJ-value correspond to something under ϵ (since, in Classic LFG, having a PRED-value is supposed to amount to having a semantic interpretation). We can achieve this effect with this reformulation of (45):

(46) $\begin{bmatrix} \text{CASE} & \text{ACC} \end{bmatrix}$: $((\text{OBJ/OBJ2}\uparrow)\,\text{SUBJ}\,\epsilon^{-1})$

This says that accusative case appears on something that is an OBJ(2) of something whose SUBJ is an ϵ-value. A plausible modification of (46) would be to use features to classify the grammatical relations, so that the disjunctive list of object GFs in (46) would be replaced by something like [+OBJ]. We will not pursue this here. We will later see that most speakers also impose the requirement that the accusative case-bearer also be an ϵ-value, but that some do not.

(46) provides a clean account of case alternations in the active-passive relationship of ditransitive verbs with dative Recipient and accusative Theme which allow either to become subject under Passive:

(47) a. Þeir   gáfu honum   peningana
       they(N) gave him(D.SG) the money(A.M.PL)

     b. Honum voru   gefnir   peningarnir
        him(D) were(PL) given(N.M.PL) the money(N.M.PL)

     c. Peningarnir   voru   gefnir   honum
        the money(N.M.PL) were(PL) given(N.M.PL) him(D)

Whichever of the two objects becomes subject, the conditions for (46) cease to be satisfied, and the accusative becomes nominative. We also of course have the peculiar agreement of the verbs with the nominative object in (b), which we discuss below.

It also requires that in the ACC-ACC pattern found with verbs of lacking, the object will have to be Quirky rather than structural, since (46) will fail to apply to it. This seems possible, but I know of no convincing evidence for or against it.

(46) gives a reasonable first approximation account of the case-marking of 'regularly' case-marked NPs, but what about the Quirky ones? We have alluded to principles presented in Andrews (2008) requiring their outer layer to have a PRED-value, but, for agreement, etc. to work out, we want their inner layer to wind up having a CASE-attribute that interfaces with the morphology in such a way that structural and Quirky accusative always have exactly the same morphological realization. A formulation that will work is (48), where X is a variable over attribute-values, with the effect that the upper PRED-value gets copied as the lower CASE-value:

$$(48) \quad \begin{bmatrix} \text{CASE} & X \end{bmatrix} \ : \ ((\text{OBL}\uparrow)\,\text{PRED}) \ = \ X$$

In order to work properly, this requires that the 'OBL' grammatical function has a very limited distribution, to only inner layers of NPs, and also that certain PRED-values be exempt from 'predicate indexing', so that they can unify. This latter is argued for on independent grounds in Andrews (1990b). A useful aspect of (48) is that the upper layer PRED-values will count as externalized if they are realized as CASE- values of an overt NP, helping to account for the somewhat degraded acceptability of Quirky PRO, since for them, the PRED would not be externalized.

Finally, observe that the structures proposed here integrate smoothly with Simpson's (1983, 1991) analysis of semantic case in Warlpiri, which realizes various kinds of adverbial and adnominal functions, similarly to prepositions in English. Simpson proposes two layers of structure, an outer one with a PRED-value, and an inner one with a CASE-value, closely coordinated. That is exactly why what we have here, with the 'coordination' being the identity relation. A sample structure would be:

$$(49) \quad \begin{bmatrix} \text{PRED} & \text{LOC} \\ \text{OBL} & \begin{bmatrix} \text{PRED} & \text{'Creek'} \\ \text{CASE} & \text{LOC} \end{bmatrix} \end{bmatrix}$$

One difference between (this kind of) semantic case and a Quirky case is that the semantic case has an SLE that interprets the PRED on its own, rather than in conjunction with another PRED-feature. This is kind of treatment will work for the few

remaining cases of relational semantic case in Icelandic reviewed in Thráinsson (2007), and is considerably simpler and cleaner than the analysis of Icelandic semantic case provided in A90 (an adaptation of Simpson's to the circumstances of Icelandic). There are a number of other phenomena that involve what might be taken as semantically interpreted case, but space precludes investigating them here (Indo-Iranian languages appear to be particularly rich in this regard, Differential Object Marking is also a problem).

4.2   The Typology of Case

We can now consider the relationship of the present proposal to the typology of case-marking proposed in Boboljik (2008). Building on Moravcsik (1974, 1978) and Marantz (1991), Boboljik proposes the following hierarchy of cases (for controlling agreement):

(50) Revised Moravcsik Hierarchy:
      Unmarked Case > Dependent Case > Lexical/Oblique Case

Unmarked case can be taken to be the 'default' case for which the nonexistence of any CASE attribute is a plausible analysis, while Dependent Case includes cases such as Ergative and Accusative, in which the existence of another argument with appropriate properties is a frequent triggering environment.

At this point two important differences arise between our account and Boboljik's, not with respect to the hierarchy itself, but rather its interpretation. Boboljik follows the tradition developed by Marantz, Bittner and Hale and McFadden (2004) of regarding dependent case as being assigned due to the presence of a 'case competitor'. In the present view, this is frequently an important factor, but not the only one, as witnessed by for example the Russian genitive of negation, and the relevance of TAMP categories for case-assignment in many 'mixed ergative' languages. For us, the dependent cases are then the ones that are assigned on the basis of specific structural characteristics of the environment of the NP, as described with an iofu expression, in which the existence of 'case competitor' is a frequently but not always a factor, and rarely the only one.

This leads on to the second difference, which is that Boboljik seems to regard nominative case as universally unmarked (and seems to have to, in order for his proposals about agreement to work out). But for languages where nominative is strongly restricted to finite subject position, it seems best to regard nominative as a marked 'dependent' case, the dependency factor being the nature of Tense-marking on the verb. There then arises the issue of whether there is any unmarked case, the traditional accusative frequently being a good candidate. If one rejects the idea of an unmarked case, a natural path to follow is Pesetsky and Torrrego's (2007 and other works) account of case as a realization of licensing by specific higher functional categories. In LFG on the other hand, treating accusative as the syntactically unmarked case seems like the best thing to do in English, Irish, Greek, etc., due to the fact that

it seems to have a default distribution. The present account is distinct from both of these approaches in that both higher features (loosely corresponding to functional projections) and co-arguments (case-competitors) can be relevant factors, and that there can be an unmarked case which doesn't have to be nominative.

The lowest position on the hierarchy is Lexical/Oblique, which is here characterized quite crisply as a CASE-feature that also appears as a higher PRED-value (whereas, the GB/Minimalist versions of this idea seem to me to all be at least mildly obscure in terms of what their implementation really is). A major challenge faced by both this account and Boboljik's is to distinguish between oblique case, and dependent case with apparent lexical conditioning, and how to insightfully implement the latter. LFG for example might deal with the Warlpiri by having the relevant verbs introduce a feature BODILY_FUNCTION +, referred to by the ergative rule, but this does not appear to express any useful insight.

A possible constraint is that arguable instances of lexically governed dependent case seem to be limited to one such; for example Warlpiri allows ergative on some intransitive subjects, and dative on some objects, the latter with only minimal effects on agreement. Corroboration for such a constraint might be forthcoming from Faroese, in which the case-system is being substantially reduced. On subjects, genitive case is completely gone, and accusative almost so, with transitive and ditransitive possibilities being severely limited as well (Thráinsson et al, 2004). Perhaps concomitantly, agreement with dative subjects seems to be surprisingly acceptable (Jónsson and Eythórsson 2005, Jónsson 2010). This suggests that Faroese datives might be shifting from an true oblique case to a lexically conditioned dependent one, made possible by the reduction in case-marking patterns.

Another important issue is exactly what forces QC to use the two-layer structure rather than have lexical entries directly specify the CASE-value. A possible answer is the behavior of gender-number-case (GNC) agreement. While finite agreement can be plausibly restricted to nominative case, this is completely hopeless for GNC agreement, so the QC structure might be the best available answer. But Andrews (2008) proposes a principle that would forbid direct imposition of a CASE-value by a lexical item, providing al alternative possible answer.

5   Nominative Objects

These appear only with verbs taking a dative subject, including a reasonable number of basic verbs, and passives of ditransitives. A striking fact about them is that the verbs can agree with the nominative object; this is in general optional (and lexically restricted, with a lot of individual variation) for the basic verbs, obligatory for the passives:

(51) a. Honum líka/líkar   þessir   hestarnir
       him(D) like(PL/SG) those(N.M.PL) horses(N.M.PL)
       He likes those horses

b. Honum voru   gefnir   þessir   hestarnir
   him(D) were(PL) given(N.M.PL) those(N.M.PL) horses(N.M.PL)
   He was given those horses

On the basis of small surveys, Sigurðsson and Holmberg (2008) find that the agreement is stronger with older speakers, weaker with younger, and identify the somewhat porous variants Icelandic A, B and C.

The optionality of agreement with basic verbs poses a strong challenge to Boboljik's thesis that agreement ignores grammatical functions, and only cares about overt case-marking, in accordance with the modified Moravcsik hierarchy. On his account, Icelandic should be a language where agreement is triggered by Unmarked case, citing Nepali, where examples like (51a) require agreement with the object. (b) behaves as expected, (a) is an unexplained anomaly. If we abandon the claim that GF has no direct relevance for agreement, then we can allow some verbs to disallow agreement with nominative objects.[24] But by what exact mechanism?

Icelandic provides an unusual challenge for whatever mechanism is proposed due to the version of Long Distance Agreement (LDA) that it manifests in examples like these:[25]

(52) Honum   eru   taldir   hafa   verið gefnir
     him(D.SG) are(3PL) believed(N.M.PL) to have been given(N.M.PL)
     peningarnir
     the money(N.M.PL)
     He is believed to have been given the money

These are typologically unusual, since LDA with objects is normally thought to require restructuring/clause-union, but in Icelandic can marginally, for some speakers, even occur across an intervening dative subject, as noted without explanation by Sigurðsson and Holmberg:
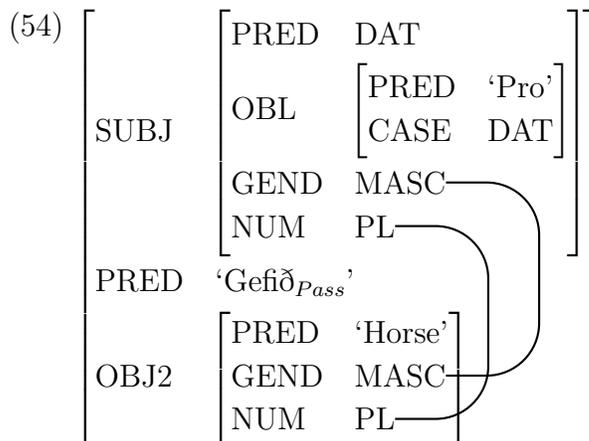
(53) Mér   virtist/%virtust   henni   hafa verið sýndir hestarnir.
     me(D) seemed(3SG/3PL) her(DAT) have been shown the horses(N.M.PL)
     She seems to me to have been shown the horses.

A82/90 proposes an analysis of these phenomenon which does account for its lexicality, and even the possibility of examples like (53).

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[24]Sigurðsson and Holmberg propose to do this by allowing some instances of nominative to be Quirky/Lexical, something that Boboljik couldn't do without vitiating his theory.

[25]It is unclear to me who thought of them first. There is one in Andrews (1982b), but Andrews (1990a, pg. 231, fn. 15) thinks he remembers seeing one in a draft of Thráinsson's thesis, although it does not appear to exist in the final version, as far as I can tell.

It is that dative subject verbs showing agreement with nominative objects have a lexical specification that equates the relevant agreement features of the object with the outer layer of the f-structure of the subject, producing a structure like this for a passive participle, where this sharing is obligatory:

(54)

$$
\begin{bmatrix}
\text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{DAT} \\ \text{OBL} & \begin{bmatrix} \text{PRED} & \text{`Pro'} \\ \text{CASE} & \text{DAT} \end{bmatrix} \\ \text{GEND} & \text{MASC} \\ \text{NUM} & \text{PL} \end{bmatrix} \\
\text{PRED} & \text{`Gefið}_{Pass}\text{'} \\
\text{OBJ2} & \begin{bmatrix} \text{PRED} & \text{`Horse'} \\ \text{GEND} & \text{MASC} \\ \text{NUM} & \text{PL} \end{bmatrix}
\end{bmatrix}
$$

This provides automatically for the fact that the passive participle agreement with objects seems to induce obligatory agreement of associated auxiliaries, but, also, suggests that LDA in (52) should be obligatory rather than optional. In particular, it provides no strictly formal account of the fact that agreement of the lower participle with its object is obligatory: in a small survey distributed at the University of Iceland in 1983, six consultants rejected a no agreement version of (52) as 'thoroughly unacceptable' ('*'), while one took it as 'acceptable, but perhaps somewhat unnatural' ('?'). The 'semi-agreeing' variant was on the other hand fully accepted by 5, and rated as questionable by 2.

The problem for LFG is that once a lexical entry such as (54) has copied the object's agreement features into the outer layer of the dative subject, the grammatical theory says that functional control ought to cause them to be present at the matrix as well as subordinate clause SUBJ-value, making agreement in the matrix obligatory rather than optional. To explain why this is not the case, we would seem to need to appeal to some sort of processing theory, noting that in the non-agreeing variant of (52), the material that shows that agreement should have happened don't appear until well after the potential agreeer:

(55) Honum   er   talið   hafa   verið gefnir
him(D.SG) are(3PL) believed(N.M.PL) to have been given(N.M.PL)
peningarnir
the money(N.M.PL)
He is believed to have been given the money

In particular, the complement auxiliaries *hafa verið* don't show agreement in any reasonably acceptable version of the sentence, producing a substantial delay before the

appearance of the agreement trigger.

Turning to (53), the fact that *virðast* is one of the verbs for which the feature-sharing is optional means that there is no problem with explaining nonagreement in this example, while the delay factor would seem to provide a reasonable account of why agreement isn't possible at all for many speakers. A82/90 therefore seems to still be tenable for this data, although Sigurðssson and Holberg's approach is highly competitive, and arguably superior in some respects. But a detailed examination, including the peculiar behavior of person-marking discussed there, is beyond the scope of this paper.

Another issue is whether the proposed treatment for apparent LDA in Icelandic has any implications for other instances of LDA with objects, as discussed by Boboljik. I would suggest not, since the feature-copying with a two-layer analysis would appear to have zero prospects of helping with these constructions. This might be seen as a strike against the present proposal, but on the other hand the circumstances in Icelandic seem rather different from those obtaining in the other languages, so it is not implausible that the mechanisms should be different.

6 Conclusion

I have shown that several peculiar properties of QC NPs in Icelandic can be explained by the two-layer hypothesis in a version of LFG+glue. These are:

(56) a. Their participation in agreement in secondary predication and certain kinds of functional control, but not with main predicates.

b. The ability of 'covertly QC' NPs to fail to trigger agreement

c. The inability of dative QC subject-selecting verbs to be functionally controlled by QC datives.

d. The ability of LDA to optionally ignore a dative intervener

This is furthermore accomplished within a framework where the QC structures are produced by the same mechanisms that are responsible for the much more widely distributed phenomenon of semantic case, and are close to what is required for some other relatively unusual phenomena such as agreement with locative NPs in Bantu (where could be treated either by having verbs agree with the locative PRED-values directly, or having these mirrored by a CASE-like attribute on the upper level).

The treatment yields a typology of case which is perhaps surprisingly consistent with that provided in the very different GB/Minimalist framework of Boboljik (2008), although his proposal to exclude GF from the conditions on agreement is clearly unworkable for Icelandic. Both approaches face major challenges in the same areas, distinguishing oblique case from dependent case with apparent lexical conditioning, and giving a full account of the agreement properties of nominative objects. This is

important because both theories predict that genuine oblique cases should be more resistant to participating in agreement than the others, albeit for somewhat different reasons (further down on the hierarchy for Boboljik, requiring greater complexity in the agreement specifications in the present analysis).

This is especially important for the present paper, because a skeptic might propose that the real reason for nonagreement with obliques is the fact that, once upon a time, most or probably all of them were not subjects, and their (non-)agreement properties are simply the result of diachronic transmission of original non-subject behavior. The counter to this is that nonagreement with QC NPs seems to be fairly robust (especially if one accepts Barðdal and Eyþórsson's (2005) arguments that 'oblique subjects' appear in all Germanic languages with case-systems), while agreement seems to relatively easily become able to apply to dependent case. But wider investigations are required to confirm that this is really true.

Another surprising congruence is with the treatment of case-marking within Construction Grammar provided by Barðdal (2008, 2011). Especially the latter appears superficially to be in direct contradiction to the position taken here, since it asserts that the dichotomy between 'lexical' (oblique) and 'structural' (unmarked/dependent) case is false. But the motivations for the distinction as presented here lie in rather technical aspects of agreement and other phenomena, which have arguably no relevance for the issues of productivity and predictability of case arrays that interest Barðdal. In this account, the appearance of both structural and lexical case are determined by the forms of SLEs such as those of (57) below, for a 'normal' verb (a) and a verb with accusative QC subject and object (b), which bear a close resemblance to lexical constructions:

(57) a.
$$\begin{bmatrix} \text{SUBJ} & [\ \ ] \\ \text{PRED} & \text{'Borða'} \\ \text{OBJ} & [\ \ ] \end{bmatrix}$$

b.
$$\begin{bmatrix} \text{SUBJ} & \begin{bmatrix} \text{PRED} & \text{ACC} \\ \text{OBL} & [\ \ ] \end{bmatrix} \\ \text{PRED} & \text{'Reka'} \\ \text{OBJ} & \begin{bmatrix} \text{PRED} & \text{ACC} \\ \text{OBL} & [\ \ ] \end{bmatrix} \end{bmatrix}$$

In particular, the GF and CASE specifications can be abstracted away as general constructions from which the specific lexical items can inherit, as part of an explanation of semantic regularities and limited productivity. Whether some specific CASE-value is written into to these representations at one particular stage or another, and how it is represented, does not seem very relevant to such questions as whether the case-frames have determinate meanings. Where the frameworks do diverge strongly is in the treatment of the linear order properties of these construction, Construction Grammar using

inheritance from constructions that involve a linear order specification, LFG using the annotated PS rules that induce constraints relating c-structure to f-structure. It remains unclear what the empirical significance of this difference is, if, indeed, it actually has any.

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