

Pivots and the Theory of Grammatical Functions^{*}

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1. Overview

Every once in a while, a theory needs to reevaluate its basic concepts. This reevaluation is necessary because, over time, as more empirical data are covered, one tends to lose sight of the original intent. What is involved in this reevaluation is not new data, but rather a new look at old data.

In the case of LFG, one of the most basic concepts is the grammatical function. LFG differs from almost every other generative theory in recognizing the centrality of grammatical functions. Other theoretical approaches recognize grammatical relations, but not grammatical functions. The concept of grammatical relation is vague; it just means some relation that is relevant to the grammar (or more precisely, the syntax). A grammatical function is something much more specific—it is a link between structure and function. We can identify grammatical relations by their (apparently arbitrary) properties; with grammatical functions, the properties are the result if we correctly understand the functions. Grammatical relations have no role in explanation; grammatical functions should be the centerpiece of explanation.

One of the most problematic grammatical functions, perhaps the most problematic, is the function SUBJ. It is problematic for two reasons. In the first place, SUBJs have many unique properties, more than other grammatical functions. Among the properties of SUBJs, we note the following (Keenan 1976, Andrews 1985).

- (1) a. binding theory prominence
Agent, if there is one
addressee of imperative
most likely to be pro-dropped
- b. controllee in Raising
most likely crosslinguistically to be extracted
“chaining” in coordinate structures
obligatory
often definite/wide scope
“external” structural position in configurational languages
- c. controllee in Equi
verb agreement
not Case marked (“nominative”)
floats quantifiers

Second, in ergative and Philippine-type languages these properties are split between two elements, with the properties in (1a) typifying one element, those in (1b) typifying another, and those in (1c) going with one or both, depending on the language. A theory of grammatical functions should predict the properties, and the split in non-nominative-accusative languages.

The usual LFG view is that SUBJ is an argument function, specifically, the most prominent argument function on the relational hierarchy. We will call this function $\hat{G}F$, parallel to the LFG notation $\hat{\theta}$ for thematically most prominent argument. The natural properties of $\hat{G}F$ would be ones involving hierarchies of arguments. Lexical specification of properties of arguments would naturally follow the relational hierarchy, so such properties as the ability to be pro-dropped and being the addressee of an imperative, which involve lexical specification (as in (2)), are $\hat{G}F$ properties.

- (2) a. “pro-drop” (↑ AF PRED) = ‘PRO’
 b. imperatives (↑ AF NUM) = 2

Similarly, the mapping from thematic roles to grammatical functions, modeled in LFG as Lexical Mapping Theory, matches the thematic hierarchy to the relational hierarchy. Therefore, the thematically highest argument (Agent) is mapped to the relationally highest grammatical function ($\hat{G}F$). What typifies all of these properties is that they are about local relations, as one would expect from the properties of an argument function.

Another subject property that follows from the function of $\hat{G}F$ is binding theory prominence. Despite the fact that binding is not necessarily local, and is not related to predicate-argument relations, it is clear from research on binding in LFG and other frameworks that it is sensitive to hierarchies at various levels: a-structure (the thematic hierarchy), c-structure (linear order), and f-structure (the relational hierarchy). The reason for the argument-sensitivity of binding may be explained by the perspective of Jackendoff (1990), who views binding as an extension of lexical conceptual structure argument binding. Whatever the reason, binding is sensitive to argument status and, in particular, to the grammatical function $\hat{G}F$.

Looking back at the original list of subject properties, the ones that are naturally accounted for by assuming that “SUBJ” is $\hat{G}F$ are the ones in (1a). However, the properties in (1b) do not make sense from this perspective. To consider the status of these properties, it is useful to divide them into two groups.

- (3) a. controllee in Raising
 most likely crosslinguistically to be extracted
 “chaining” in coordinate structures
- b. obligatory
 often definite/wide scope
 “external” structural position in configurational languages

The properties in (3a) are not local; they deal with relations between clauses. There is no reason to expect these properties to follow from the SUBJ-as-most-prominent-argument approach. The ones in (3b), while not nonlocal, are not related to argument hierarchies. Instead, they seem to be based on the notion that the SUBJ is a distinguished element of the clause, with properties beyond being in a particular position on the relational hierarchy. The fact that these properties characterize a different element from the argument-related properties in certain types of languages reinforces the conclusion that these properties do not follow from the nature of the function $\hat{G}F$.

We propose that the (1b) properties are associated with a grammatical function which we call PIV (pivot), following Foley and Van Valin (1984) and Dixon (1994). In the next section, we will outline our proposal for the function PIV.

2. Pivots

We can divide the grammatical functions generally assumed in LFG (as in, for example, Bresnan in press) into three groups: the argument functions, the adjunct functions, and the discourse functions. Of these, the argument functions and the adjunct functions are local in their scope—they function to express local relations within their clause. The discourse functions, on the other hand, relate elements to the larger discourse within which they are embedded. The

argument functions and adjunct functions are further distinguished from each other in terms of the nature of their relation to the clause: arguments are directly (and lexically) related to the head, whereas adjuncts are related to the clause as a whole.

Something is missing from this set of relations expressed by grammatical functions: a function expressing the relation between elements of a clause and the sentence (i.e. larger *syntactic* structure) of which it is a part. It is this gap that we propose to close with the function PIV. The function of the PIV function is primarily syntactic cross-clausal continuity, a kind of sentence-internal topic. Just as a discourse topic (represented syntactically in many languages as the grammatical function TOPIC) identifies a single participant as the common thread running through a discourse, the PIV is the common thread running through clauses that make up a sentence.

Secondarily, by virtue of being singled out, the PIV has the status of the distinguished element of the clause. Although we will have nothing further to say about them here, such properties as obligatoriness, definiteness, and scopal properties may be a result of this “distinguished element” status of PIVs.

Crucially, PIV is not inherently characterized in terms of argumenthood properties. The function PIV is thus related to the discourse functions; like FOCUS and TOPIC, it is a second function assigned to an element of a clause. First and foremost, every element in syntax must be licensed locally, by being either an argument or an adjunct; more global functions are then added, or overlaid. Unlike such functions as FOCUS and TOPIC, PIV does not, as noted above, relate to discourse; we will therefore use the term “overlay function” (Johnson and Postal 1980) to refer to the class of functions consisting of the discourse functions and PIV.

The typological distinction between nominative-accusative, syntactically ergative, and Philippine-type languages is in the identification of the PIV, which, as an overlay function, is subject to the Extended Coherence Condition. In nominative-accusative languages, the equation (4a) identifies the PIV and in syntactically ergative languages (4b), while in Philippine-type languages the “voice” morpheme is associated with a specification for PIV (4c).¹

- (4) a. $(\uparrow \text{PIV}) = (\uparrow \hat{G}F)$
 b. $(\uparrow \text{OBJ}) \Rightarrow (\uparrow \text{PIV}) = (\uparrow \text{OBJ})$
 c. “Active voice”: $(\uparrow \text{PIV}) = (\uparrow \hat{G}F)$
 “Direct object voice”: $(\uparrow \text{PIV}) = (\uparrow \text{OBJ})$
 “Indirect object/locative voice”: $(\uparrow \text{PIV}) = (\uparrow \text{OBJ}_\theta)$
 “Instrumental voice”: $(\uparrow \text{PIV}) = (\uparrow \text{OBL}_{\text{Instr}})$
 etc.

Note the f-structures for the following sentence from Samoan, a syntactically ergative language (from Mosel and Hovdhaugen 1992), and for its translation into English, a nominative-accusative language.

¹An interesting question about the Philippine-type languages is whether the benefactives, locatives, and other elements that can be PIV are adjuncts. If they are (and this is the most straightforward interpretation of the facts), nothing in my account precludes this possibility. On the other hand, it is not clear how something like the inverse mapping approach to be discussed in the final section of this paper could accommodate a nonargument as PIV.

- (5) Sā fasi le maile e le teine.
 PAST hit ART dog ERG ART girl
 ‘The girl hit the dog.’

- (6) a.
$$\left[\begin{array}{ll} \text{TENSE} & \text{PAST} \\ \text{PRED} & \text{'hit } \langle (\uparrow \hat{\text{GF}}) (\uparrow \text{OBJ}) \rangle \\ \text{PIV} & [\text{"dog"}] \\ \hat{\text{GF}} & [\text{"girl"}] \\ \text{OBJ} & \end{array} \right]$$
- b.
$$\left[\begin{array}{ll} \text{PIV} & [\text{"girl"}] \\ \hat{\text{GF}} & \\ \text{TENSE} & \text{PAST} \\ \text{PRED} & \text{'hit } \langle (\uparrow \hat{\text{GF}}) (\uparrow \text{OBJ}) \rangle \\ \text{OBJ} & [\text{"dog"}] \end{array} \right]$$

The arguments map to the same grammatical functions in the two languages; the only difference is the identification of the PIV. There are other possibilities for the PIV as well. In Acehnese, for example, any core function can be the PIV (Durie 1985).

The idea that PIV is the function of syntactic cross-clausal continuity can be formalized in a way that recaptures a lost idea from early LFG. In Kaplan and Bresnan (1982), it was proposed that there is a locality condition on functional designations, a proposal that was subsequently abandoned with the advent of the formalism of functional uncertainty. The abandonment of the functional locality condition has left LFG with no formal expression of the intuitive idea that arguments are beholden exclusively to the predicates of which they are arguments. The PIV function allows us to express this: the only way to refer to a function in a lower nucleus is through the function PIV. We call this the Pivot Condition; it is a formal statement of the functional role of PIV. We also propose, more tentatively, that PIV only functions for outside-in designation.

(7) **The Pivot Condition**

- ① In a functional designation $(\uparrow \dots \alpha \dots \beta)$ where $(\rightarrow \overset{\alpha}{\text{PRED}})$ and $\beta \neq \emptyset$, $\beta = \text{PIV}$
- ② In a functional designation $(\alpha \beta \uparrow)$ where β is a single GF and $\alpha \neq \emptyset$, $\beta \neq \text{PIV}$

The PIV, then, is an element of a clause which is distinguished by being singled out as the element of cross-clausal continuity in a sentence. As noted earlier, this makes it similar to TOPIC, which is the function of cross-sentence continuity in a discourse. However, PIV is purely syntactic in its scope, not relating directly to discourse matters. Interestingly, the position of PIV in the c-structure of configurational languages confirms this view of PIV as being in some sense intermediate between argument and adjunct functions on one hand and discourse functions on the other. The structural position for arguments is as sister to the lexical heads of which they are arguments, the closest possible structural position to the head. Adjuncts are typically adjoined to a higher node, farther away from the head. Elements bearing discourse functions are farther

still, either adjoined to IP or in [SPEC, CP]. The structural position typically associated with PIV, [SPEC, IP], is closer to the lexical head than the place of discourse functions but farther than most adjuncts. The general picture that emerges is that configurational languages represent grammatical functions iconically in the c-structure. This approach also provides an explanation for what in purely c-structural theories is a stipulated property of subjects: the “external” structural position.² However, the external position is not associated with an argument, so the term “external argument” for SUBJ is inappropriate.

We will further flesh out this picture by focusing on the analyses of extraction and control. We will show how the notions of PIV and GF provide the basis for an explanation of the observed patterns.

3. Long-Distance Dependencies

The relevance of subjecthood to long-distance dependency constructions is not a new observation. The fact that extraction of subjects is different from other types of extraction can be shown in many ways. In this section, we will examine three aspects of extraction. First, we will show how subject extraction formally differs from other types of extraction under the theory of pivots, then we will discuss subject/nonsubject asymmetries in across-the-board extraction, and finally, we will discuss the *that*-trace effect.

3.1. Extraction of Subjects and Nonsubjects

The LFG analysis of extraction constructions is based on the formalism of functional uncertainty. As originally proposed (Kaplan and Zaenen 1989), a functional uncertainty equation has the following form:

$$(8) \quad (\uparrow \text{DF}) = (\uparrow \text{PathIn GF})$$

Under the Pivot Condition, “GF” can only be PIV.

There are some languages in which only the PIV can be extracted, as predicted, such as Tagalog (Schachter 1976, Kroeger 1993), Jakaltek (Manning 1996), Dyirbal (Dixon 1994), Inuit (Manning 1996), etc. For other languages, we follow Bresnan (in press) in hypothesizing the availability of inside-out functional uncertainty licensing of long-distance dependencies as a loophole to the Pivot Condition. The more tentative half of the Pivot Condition will rule out the inside-out licensing of a long-distance dependency the lower end of which is PIV. This approach thus draws a sharp distinction between the extraction of PIV and the extraction of other elements. In this way, it echoes an idea from early constraint-based theorizing (Gazdar 1981, Falk 1983) that null c-structure nodes exist in long-distance dependencies except for cases of subject extraction. Unlike the earlier accounts, however, the theory of pivots explains why “subject” extraction is different.

Local “extraction” of PIV may be different still. Since PIV is an overlay function, and in configurational languages occupies an overlay function position, it can also be assigned other overlay (discourse) functions as well. Thus, at least in some languages, discourse functions are

²A similar explanation can be found in Bresnan (in press), where SUBJ is identified as being simultaneously an argument function and a discourse function. However, Bresnan’s motivation for calling SUBJ a discourse function is not entirely clear. I believe that the theory of pivots being proposed here captures the spirit of Bresnan’s approach, but in a better motivated way.

assigned to PIV in situ, without need for a special structural position. The outside-in equation identifying a DF with a PIV will only be applicable in case the DF and local PIV are not identified with each other. English is one such language; it has long been noted that matrix subject questions appear to have the structure of ordinary declarative clauses. We assume, then, that English has three ways of licensing long-distance dependencies.

- (9) a. (probably an optional annotation on verbs:
 $(\uparrow \text{DF}) \neq (\uparrow \text{PIV}) \Rightarrow (\uparrow \text{DF}) = (\uparrow \text{COMP}^+ \text{PIV})$)
- b. Annotated to null c-structure nodes:
 $\uparrow = ((\text{COMP}^* \text{GF} \uparrow) \text{DF})$
- c. $\text{IP} \rightarrow \begin{array}{ccc} & \text{NP} & \text{I}' \\ (\uparrow \text{PIV}) = \downarrow \uparrow & & = \downarrow \\ ((\uparrow \text{DF}) = \downarrow) & & \end{array}$

Other languages will have variations on this theme. For example, languages in which the PIV cannot be locally assigned a discourse function will have a Kleene star instead of a Kleene plus in the outside-in PIV equation (and will lack the conditional). Similarly, the outside-in equation may be associated with different c-structure nodes in different languages.

3.2. Across-the-Board Extraction

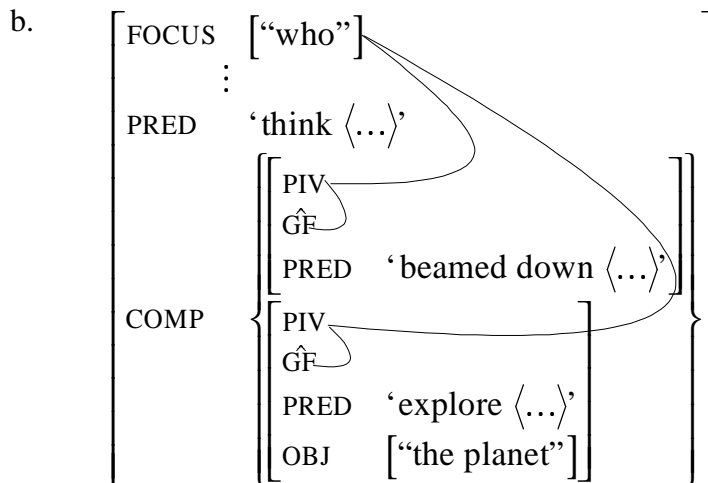
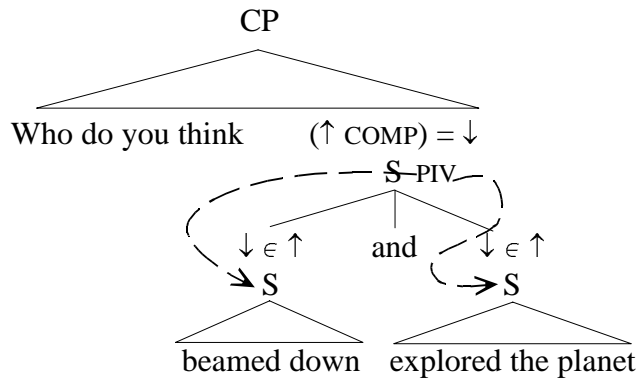
One place where subject/nonsubject asymmetries have been observed is in across-the-board extractions in coordinate structures. With one small addition, the above account of extraction in English accounts for the across-the-board facts.

In English, across-the-board extraction can involve subjects at the top level of the coordination in all clauses, or other elements in all clauses (nonsubjects and embedded subjects), but not a combination of top-level subjects and other elements.

- (10) a. Who do you think [[beamed down] and [explored the planet]]?
 b. What did you claim [[I brought back] and [everyone thinks is fascinating]]?
 c. *Who do you think [[the captain likes] and [got promoted]]?

Across the board extraction of top-level subjects follows automatically. The outside-in equation licensing PIV extraction will terminate at the coordinated complement, and the PIV thus identified will distribute among the conjuncts (Kaplan and Maxwell 1988).

(11) a.



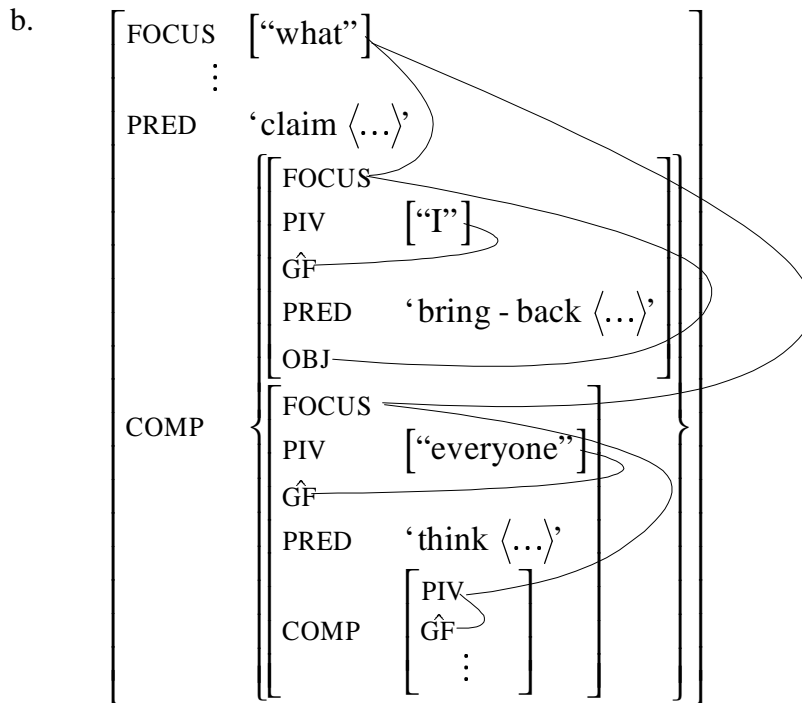
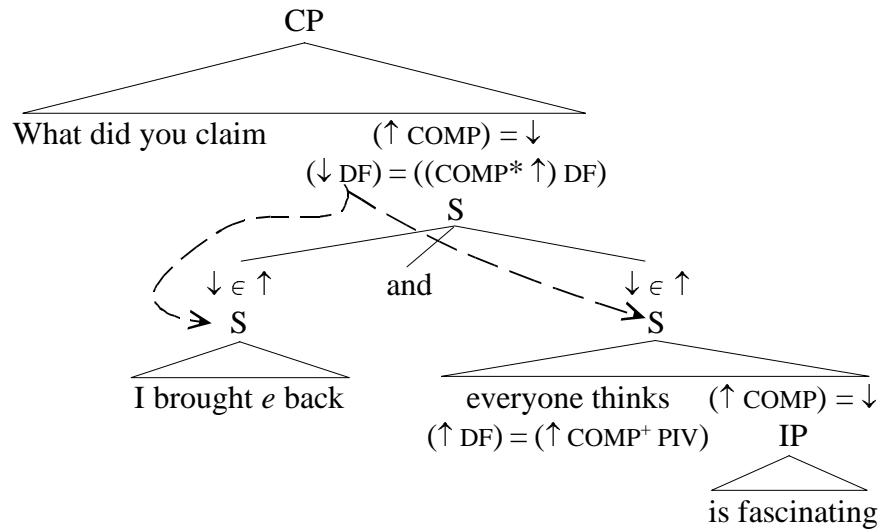
However, since other functions cannot be licensed as the lower end of extraction dependencies by outside-in specification (by the Pivot Condition), they must involve inside-out designation. Inside-out designators cannot “escape” conjoined structures. The only way to license across-the-board extraction in these cases is to associate the root of the coordinated structure with the following equation:³

$$(12) \quad (\downarrow \text{DF}) = ((\text{COMP}^* \uparrow) \text{DF})$$

This “copy” DF will be distributed between the conjuncts.

³Joan Bresnan (personal communication) helped we work out some of the formal details here.

(13) a.



Given this system, there is no way to license the subject-nonsubject version.

Other languages have slightly different patterns. For example, according to Saiki (1985) in Japanese no subject-nonsubject combination is permitted in across-the-board extraction, regardless of degree of embedding. The details will depend on which nodes the various

functional uncertainty equations are annotated to.⁴

3.3. The *that*-trace effect

One of the best known, and least understood, constraints on extraction is the “*that*-trace effect.” It is usually attributed to some ad hoc structural restriction. The theory of pivots provides a new approach, one which is more principled and less arbitrary.

The first observation is that, contrary to what is generally supposed, the *that*-trace effect is a lexical property of the head complementizer. For example, as observed by Shlonsky (1988), in Hebrew the complementizer *še* ‘that’ does not induce the *that*-trace effect, while *im* ‘if’ does.⁵

- (14) a. Mi taanta še niceax et ha- romulanim?
 who you.claimed that defeated ACC the- Romulans
 ‘Who did you claim (that) defeated the Romulans?’
- b. *Mi šaalta im niceax et ha- romulanim?
 who you.asked if defeated ACC the- Romulans
 ‘Who did you ask if defeated the Romulans?’

Sobin (1987) claims that some speakers of English display a similar pattern. So the *that*-trace effect will be due to some marking in the complementizer’s lexical entry.

The second observation about the *that*-trace phenomenon is that different types of complement clauses are more or less closely bound to the main clause. For example, Givón (1990: 517) states that “cognition-utterance” verbs take complements which are less closely bound to the main verb than verbs of modality and manipulation. He also discusses different types of complements, and observes that finite complements involve a weaker bond than nonfinite. These two observations are related to each other, since verbs of cognition and utterance are more likely to take finite complements.

The complementizer, which marks the type of complement, is a natural place to expect

⁴In this specific case, Saiki proposes that the outside-in equation is annotated to the root of the relative clause. We also assume that an outside-in equation can be associated with the root of the coordination.

- (i) a. NP → S NP
 $\downarrow \in (\uparrow \text{ADJ}) \quad \uparrow = \downarrow$
 $(\downarrow \text{DF PRED}) = \text{‘PRO’}$
 $((\downarrow \text{DF}) = (\downarrow \text{GF * PIV}))$
- b. S → S CONJ S
 $\downarrow \in \uparrow ((\uparrow \text{DF}) = ((\text{GF * } \uparrow) \text{DF})) \downarrow \in \uparrow$
 $((\uparrow \text{DF}) = (\uparrow \text{GF * PIV}))$

If PIV extraction cannot be licensed inside-out, this will result in the Japanese facts.

⁵Shlonsky attributes this to *še* cliticizing to the element to its right. He claims that *še* is a “phonetic clitic” on the grounds that it is not related to another word (the way English *that* is), it cannot be contrastively stressed, and cannot occur in isolation. He then argues for the possibility of syntactic cliticization on the basis of a problematic (by his own admission) analysis of multiple *wh* constructions and on the basis of a particular analysis of free relatives in Hebrew. The argument for *še* even being a phonetic clitic is weak, as *that* is also resistant to contrastive stress and cannot occur (as a complementizer) in isolation.

notions such as the bond between clauses to be grammaticalized. And, under the theory proposed here, the bond between clauses is localized in the PIV. A loose bond with the main clause could then be formalized as a lexical specification on the complementizer blocking identity of the PIV with some higher element.

$$(15) \quad (\uparrow \text{PIV}) \neq ((\text{GF}^* \text{COMP} \uparrow) \text{GF})$$

This lexical specification has the *that*-trace effect as its consequence.

4. Control constructions

Control constructions provide a clear example of the complex interplay between notional construction types and formal analysis. In the standard LFG analysis, equi constructions can involve either functional control or anaphoric control.⁶ While standard analyses identify the controllee as invariably SUBJ, the theory of GF and PIV make different predictions for the two constructions. Anaphoric control is formally similar to “pro-drop”: the verb licenses an unexpressed pronoun as one of its arguments.

$$(16) \quad (\uparrow \text{Controllee PRED}) = \text{'PRO'} + \text{constraints on referential possibilities for Controllee}$$

Functional control, on the other hand, is a lexical property of the governing verb, which specifies that one of its arguments is formally identical with an element in the XCOMP.

$$(17) \quad (\uparrow \text{Controller}) = (\uparrow \text{XCOMP Controllee})$$

Due to length limitations, we will not deal with the controller. We will, however, consider the nature of the controllee in these two constructions. In the case of anaphoric control, the verb specifies information about one of its arguments. Such argument-related specification is subject to the relational hierarchy; if it is limited to a single argument, it is limited to GF. On the other hand, in functional control information about an element in a lower nucleus is specified. Under the Pivot Condition, such specification can only involve PIV. We therefore predict that anaphoric controllees, if they are limited at all, will be limited to GF, while functional controllees must be PIV. This can, of course, only be tested in languages which do not automatically identify GF and PIV.

One language in which the prediction holds is Tagalog⁷ (Kroeger 1993). Kroeger shows that in Raising, which has to be functional control, the controllee is the PIV.⁸

⁶Or a complex predicate construction. Complex predicates, whatever the correct analysis, involve manipulations of a-structure, so we will ignore them here.

⁷Abbreviations in the glosses: Aside from the obvious, ACT=Active “voice”, DO=Direct Object “voice”, IO=Indirect Object (or Dative) “voice”, COMP=complementizer, LNK=linker. I gloss the Case marker for nonpivot Actors ERG.

⁸In some languages, particularly Polynesian languages, Raising is not limited to PIV. We conjecture that these allow inside-out raising. This conclusion is reinforced by the fact that in at least some of these languages a resumptive pronoun is allowed in the XCOMP. Tagalog, too, has what Kroeger calls the “copy raising” construction, in which the controllee is not the PIV.

- (18) a. (Kroeger (2.11))
 Pinang- aakalaan si Fidel na makakagawa
 IMPERF- think.IO NOM Fidel COMP ACT.NONVOL.FUT.do
 ng mabute.
 ACC good
 ‘Fidel is thought to be able to do something good.’
- b. (Kroeger (2.13))
 Malapit na si Manuel na hulihin ng polis.
 STAT.close already NOM Manuel COMP catch.DO ERG police
 ‘Manuel is about to be arrested by the police.’

For equi, he shows that, for semantic reasons, the controllee must be the Actor (i.e. $\hat{G}F$). However, there is a lexically defined class of verbs which allow either the PIV or the $\hat{G}F$ to be the controllee.

- (19) a. (Kroeger (4.48))
 Nagpilit si Maria -ng bigy- an ng pera ni Ben.
 PERF.ACT.insist.on NOM Maria COMP give- IO ACC money ERG Ben
 ‘Maria insisted on being given the money by Ben.’
- b. (Kroeger (4.54))
 Nagpilit si Maria -ng bigy- an ng pera si Ben.
 PERF.ACT.insist.on NOM Maria COMP give- IO ACC money NOM Ben
 ‘Maria insisted on giving money to Ben.’

Kroeger identifies the more common $\hat{G}F$ controllee construction as involving anaphoric control, and the lexically governed PIV controllee construction as involving functional control.

While Kroeger’s account of functional control fits our prediction exactly, more needs to be said about anaphoric control. On the one hand, Kroeger claims that semantic constraints on control are enough to account for the properties of the construction, while on the other he assumes a universal syntactic constraint limiting controllees to core arguments. It can be argued that Tagalog has a syntactic constraint licensing $\hat{G}F$ as anaphoric controllee, a constraint which operates in parallel to the semantic restrictions on control. Consider complement verbs in the nonvolitive mood. Because of the semantics of nonvolitive mood, the complement $\hat{G}F$ cannot be the controllee. However, in at least some cases, the $\hat{G}F$ can be an unexpressed pronoun with arbitrary interpretation.

- (20) (Kroeger (4.46a))
 Nag- atubili si Maria -ng ma- bigy- an ng pera
 PERF.ACT- hesitate NOM Maria COMP NONVOL- give- IO ACC money
 si Ben.
 NOM Ben
 ‘Maria hesitated for (someone) to give the money to Ben.’

According to Kroeger, arbitrary interpretation is a property of anaphoric control; pro-drop in

Tagalog does not allow it. This unexpressed $\hat{G}F$ must therefore be licensed by the same mechanism that licenses anaphoric control. In this case, it cannot be the semantics of the control construction, because those semantics rule out control with a nonvolitive complement. It must be a syntactic specification allowing an unexpressed pronoun with control properties as $\hat{G}F$.

In other languages, equi may be more consistent. For example, in Chukchee (Comrie 1979) and Inuit (Manning 1996) the controllee is always $\hat{G}F$, and in Balinese it is always the PIV (Arka and Simpson 1998). Such languages use only anaphoric control or only functional control.

5. Comparison with Inverse Mapping Theory

The theory proposed here contrasts with the generally accepted theory of ergative and Philippine-type languages in LFG. The more conventional approach, spelled out most completely by Manning (1996), can be called the “inverse mapping theory.” According to the inverse mapping theory, languages differ in the mapping of arguments to grammatical functions. Nominative-accusative mapping maintains the a-structure hierarchy at f-structure, with the thematically most prominent core argument mapping to SUBJ and the lower one to OBJ. Ergative mapping, on the other hand, reverses the hierarchy: the thematically most prominent argument is mapped to OBJ and the lower one to SUBJ. On this view, our PIV is SUBJ, and our $\hat{G}F$ is the most prominent argument in a-structure ($\hat{\theta}$ in standard LFG terminology, “a-structure SUBJ” in Manning’s). The theory proposed here has both conceptual and descriptive⁹ advantages over the inverse mapping theory.

The inverse mapping theory belongs to a family of approaches, including the Relational Grammar analysis of Bell (1983), which treat $\hat{G}F$ and PIV as different types of SUBJ, or SUBJs at different levels (a-structure/f-structure, initial stratum/final stratum). Calling them different types of SUBJ implies that they are essentially the same type of entity, with similar properties. However, as we have seen, PIV properties and $\hat{G}F$ properties are completely distinct from each other. Even cases that appear superficially to overlap, such as being the controllee in equi constructions, turns out on closer analysis to involve distinct formal constructions. The claim made here, that the two functions are formally distinct but coincide in most languages, is more in line with this observation.

More specifically, approaches like the inverse mapping theory conceptualizes them as having the same essential function at two different dimensions of linguistic structure. The inverse mapping theory identifies this function more specifically as expression of relative prominence of arguments. $\hat{G}F$ and PIV are thus both argument functions. This distinguishes it sharply from the approach argued for here, under which PIV is not an argument function. At the outset, we argued that a theory of grammatical functions should explain the properties of syntactic elements; as we have shown, the properties of PIV are not argumenthood properties. The inverse mapping theory can stipulate that, for example, in certain languages only “surface/grammatical” subjects can extract, but it cannot explain this. The theory of pivots explains this and other properties.

Finally on the conceptual plane, there is something improbable about inverse mapping. It is understandable that in mapping from one dimension of linguistic structure to another basic concepts of prominence would be maintained. The sketch of argument mapping presented by

⁹I say “descriptive” instead of “empirical” because it is not clear to me that the theories can be distinguished empirically. That is to say, any empirical facts that can be expressed in one can also be expressed in the other. The question is rather how natural the description of empirical facts is.

Jackendoff (1990) is based on a hierarchy-to-hierarchy mapping, and this is also the idea behind the OT concept of Harmonic Alignment of prominence hierarchies. Inverse mapping seems strange under such a view.¹⁰

The theory proposed here is most like Schachter's seminal paper (1976) on Philippine-type languages; Schachter also proposed that two quite distinct grammatical functions are involved, although he was not very precise in defining the functions. Similar analyses have been proposed within Government/Binding theory, such as Guilfoyle, Hung, and Travis' (1992) study of Philippine-type languages and Bittner and Hale's (1996) discussion of Case typology. In the GB version, the functions are expressed in terms of structural positions: $\hat{G}\hat{F}$ in the VP-internal "subject" position and PIV in [SPEC, IP]. Bittner and Hale even explicitly state that their PIV position is an "A" (nonargument) position. The GB version, lacking a concept of grammatical function, is less predictive, and the machinery is convoluted, being based on Case-induced movement. The LFG version is thus conceptually preferable to the GB version as well.

As mentioned above, there are also descriptive problems with the inverse mapping theory. One such descriptive problem is that it conflates the argument structure concept $\hat{\theta}$ and the grammatical function $\hat{G}\hat{F}$. Since a-structure-f-structure mapping preserves prominence relations, this conflation is usually innocuous. In fact, Manning seems to consider it an advantage. However, as he himself points out in his discussion of binding theory, while many languages seem to allow any \hat{X} (i.e. either $\hat{\theta}$ or $\hat{G}\hat{F}$) to antecede reflexives, there are some that are limited to one or the other, such as Malayalam (in which only $\hat{G}\hat{F}$ can be the antecedent) and Marathi (in which only $\hat{\theta}$ can be the antecedent).

Certain phenomena in Indonesian have been discussed in LFG, using the inverse mapping theory, by Arka and Manning (1998). Much of their analysis can be translated in a straightforward manner into the theory proposed here. However, certain aspects of their analysis are problematic under their assumptions and simple under ours. Consider the question of structural realization of arguments. The PIV in Indonesian appears clause initially, in [SPEC, IP]. Within the VP, the verb is followed by non-PIV arguments other than the (non-PIV) Agent ($\hat{G}\hat{F}$). The Agent ($\hat{G}\hat{F}$) appears initially in the VP, either as a pronoun or a clitic on the verb. Under the inverse mapping theory, non-PIV Agents and non-PIV Patients both bear the function OBJ, even

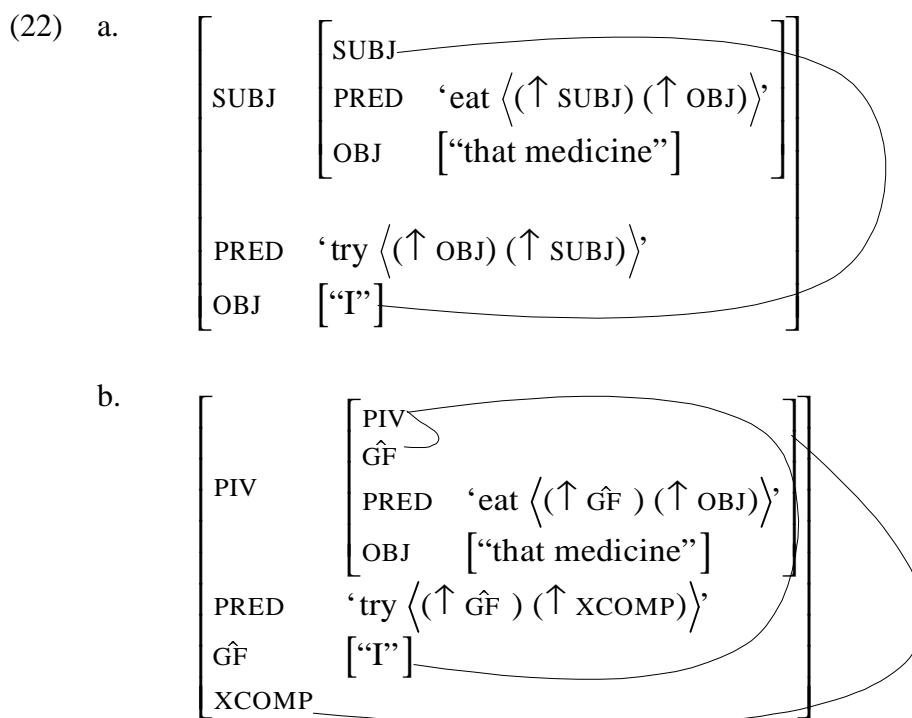
¹⁰Chris Manning (personal communication) has objected to this objection on the grounds that identifying PIV with OBJ, as I claim syntactically ergative languages do, also involves a mismatch of prominence across different linguistic dimensions. While Manning's point does have some validity, and this may explain the rarity of languages in which PIV is not automatically associated with $\hat{G}\hat{F}$, there is a fundamental conceptual difference between inverse mapping and the theory of pivots. Mapping involves representing essentially the same relations (specifically, predicate-argument relations) at different dimensions of linguistic structure. An argument is the most prominent argument ultimately because of its position in conceptual structure. The most sensible system of mapping, and what I claim is the only available one, will maintain this prominence through to the syntax. Being a PIV, like being a TOPIC or being picked out by contrastive stress, represents a different type of prominence, one unrelated to argument status and ultimately unrelated to lexical conceptual structure. It also does not involve mapping from one level to another (since PIV and $\hat{G}\hat{F}$ are both f-structure functions). It simply assigns a second function to an element which is already part of the f-structure. In other words, denying PIV the status of an argument function is not mere terminology; it reflects the core difference between the approaches. Manning also observes, quite correctly, that despite the apparent negative reading that his theory gets here, there are some fundamental issues on which we are in complete agreement. Foremost among these is that he and I both reject an analysis of syntactically ergative languages in which all sentences are intransitive, with the ergative argument being similar to a passive *by* phrase.

though they have completely disjoint distributional properties. The phrase structure rules therefore need to refer to nonsyntactic representations. Under the account proposed here, only Patients are OBJ; Agents are GF.

Arka and Simpson (1998) discuss control in Balinese from the perspective of inverse mapping theory. They argue that Balinese control is problematic for the classical LFG theory of control (Bresnan 1982), because (functionally) controlled arguments need not bear the function XCOMP. The evidence is that functionally controlled arguments, both equi and raising, can be “subjects” (i.e. PIVs).

- (21) a. Equi (Arka and Simpson (2))
 [naar ubad ento] tegarang tiang
 ACT.eat medicine that DO.try I
 ‘To take the medicine I tried.’
- b. Raising (Arka and Simpson (57))
 [ng- alih Luh Sari] ane tawang=a tiang
 ACT- look.for Luh Sari REL DO.know=3 I
 ‘Looking for Luh Sari is what (s)he knows of me.’

The inverse mapping theory f-structure for (21a) is (22a); ours is (22b).



Under the theory proposed here, the Balinese control facts do not contradict the classical LFG theory of control. What makes Balinese different is that one realization of the “direct object voice” morpheme equation is:

(23) $(\uparrow \text{PIV}) = (\uparrow \text{XCOMP})$

That is to say, Balinese allows XCOMPs to be PIV.

The theory of pivots is thus preferable to the inverse mapping theory of ergative and Philippine-type languages. It has stronger conceptual grounding, is more explanatory, provides more adequate descriptions of linguistic facts, and is more consistent with theoretical assumptions in LFG.

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