

# **Reflexive Syntax as Management of Uncertainty**

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## **1. Abstract**

Detailed examination of a fundamental construct reveals the operative role for efficient management of uncertainty in syntactic constructions. Shifting the level of analysis to functional purpose allows a simple unified and explanatory account of diverse phenomena to obviate complex accounts involving a disjunction of unintegrated processes. This analysis explains why reflexives should exist in natural languages.

What is reflexivity? To supplement accounts confined to how it might be rationally generated in a syntactic module lacking inputs, we ask: What is it for and why does it exist? We find a system of structured logical psychological linguistic actions for efficiently managing uncertainty. This complements structural analyses per the seminal work of (Chomsky, 1981) which continue through the present to wider generative treatments extended to exempt/logophoric phenomena. (Dana Cohen, 2018).

For good methodological reason, the generative paradigm for morpho-syntax has been detached in practice from a functional notion of purposeful intent, operating from a null state, lacking instigational inputs in a cognitively unstimulated mental module. This has been advantageous for enabling progress in the complex domain of human language, but the generative program does not preclude looking beyond, to connections with purposeful intent, as explicitly anticipated by (Chomsky, 1995). Recourse to structural purpose results in a more fully enabled model, referred to here as Purposeful Grammar. This offers new descriptive and explanatory insight, and encourages reintegration and interconnections within larger theories of cognition, as well as future AI models.

We include prominent work of Cognitive Linguistic, Head-Driven Phrase Structure Grammar and Gricean Pragmatics for comparison and coverage of data. The PG approach excels because, for treatment of both exempt and non-exempt reflexives, it handles all cases with a simple principle of probabilistic efficiency, precluding complex configurational constraints that fail to explain the very existence of reflexives and reliance on differential description of sentence sets rather than particular sentence instigation. PG's particular unification of exempt/non-exempt properties are exceptional and unique;

Beyond functional perspective, grammar of purpose sheds light on the underlying reasons for the

theoretical utility of formal concepts such as C-Command and the Extended Projection Principle. Functional regulation of structure expands understanding of Universal Grammar to explain rapid child language learning from a paucity of data. Two goals are sought: to provide an empirically better analysis of reflexives and to give better conceptual underpinnings for generative syntax by showing the essential role of function.

## 2. Preliminaries

### 2.1. Thesis

We propose:

- A simple, comprehensive and explanatory account of reflexives requires a shift in level of analysis from syntactic structural features to one of functional purpose.
- The purpose of reflexives is to efficiently manage uncertainty in communication.
- Speakers of a language share default statistical assumptions about more likely states in linguistic descriptions. This allows the most common to be communicated efficiently without special marking, reserved for the less usual state.
- Reflexive markings are signals by the speaker of diversion from the default assumption/expectation<sup>1</sup> of the more likely case, to a less likely one. It is most efficient to mark the less common state.
- For basic reflexives, the default assumption/expectation is of no coreference.
- For extended/exempt reflexives, the likely default assumption/expectation is varied and pertains to the marked element, but is otherwise formally explicit, relying on inference from the default assumptions that are shared among speakers.
- Functional input supplies a simple instruction to linguistic construction processes to enact reflexive marking for non-default interpretation. This minimal interface does not require complex cognitive linguistic analysis and provides an architecture more amenable to an artificial intelligence model of sentence generation.

### 2.2. Organization of the Paper

- We begin with a revised functional analysis of basic reflexivization contrasted against Chomsky's classic seminal principles (Chomsky, 1981), since these continue as the foundation for a superstructure to account for a widened range of ('exempt') data. This brings out the role of management of uncertainty in the usage of reflexives.
- We present general evidence that the notion of divergence from default is the central principal underlying reflexives.
- Based on the functional foundation, we extend the analysis to reflexive phenomena known as 'exempt' because they do not neatly fit the original Principle A analysis of binding theory (Dana Cohen, 2018). These often involve representational contexts (pictures etc.), point of view/perspective, and logophoric contexts.
- The shift in level of analysis from structural form to management of uncertainty obviates superfluous disjunctions of disparate explanations, resulting in a unified functional account. Management of uncertainty has greater explanatory power than configurational/structural constructions.

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<sup>1</sup> The terms *assumption* and *expectation* will be used interchangeably and should be taken to imply one another.

- We survey Cognitive Linguistic, Head-Driven Phrase Structure Grammar and Gricean Pragmatics to show that Purposeful Grammar offers a simplified and unified account of commonly data patterns, compared to treatments with multiple complex explanations for subsets of data, and requiring complex configurational machinery.

### 2.3. Introduction

We pursue intentional functional purpose as instigation for particular linguistic structures in a sentence.<sup>2</sup> With limited exceptions, functional analysis for specified purpose has been overshadowed by interest in form, configuration and semantic interpretation filtering as explanations for syntactic construction, despite Chomsky's prescient anticipation of inputs from an intentional/conceptual interface.

During a long period of investigation, issues surrounding reflexives have remained far from resolved, or even convergent. This can be an indication that understanding can benefit from investigation at a different level of abstraction. For comprehensive coverage of earlier work on reflexivity, consult: (Reuland, 2018) (Reuland, Anaphora and Language Design, 2011) and their references. For a concise introduction to contentious and unresolved issues in the earlier history of reflexive syntax theory, consult (Partee, 2008). For experimental evidence that the predictions of classical binding theory are not borne out in actual speaker judgments, consult (Keller, 2001).

Purposeful Grammar (PG) offers a linguistic hypothesis, that a sentence is initiated in a set of structural actions for functional purposes, and that these are evident from common observation of linguistic usage. These are a *sine qua non*, a necessity in generative production by speakers, even though absent in standard formalist generative models

We explore syntactic facts of English reflexivization, considered in a context of functional utility, for a simpler and more explanatory account than is possible in an exclusively structural analysis. The view of reflexives as a strategy for efficient management of uncertainty opens a new explanatory potential.

Is purposeful structural instigation anathema to the generative program? This seems a risky skepticism in light of Chomsky's own advertisements for an interface (so far unexplored) to linguistic intention (Chomsky, 1995), The generative program anticipates such ongoing progressive revisions. Functional intention has been envisaged by Chomsky while backgrounded to promote progress on issues of structure and form. From an artificial intelligence perspective, connecting the syntax construction module to an intention/purpose

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<sup>2</sup> Wherever, the words 'intend' or 'intent/intention' occur below their meaning involves both function and purpose. This is distinct from, and only glancingly related to, an obscure alternate sense of 'intention' more akin to 'semantics' more generally as it relates/projects to the outside world, as found in some philosophical and neurological discussions (N.B. the philosophical distinction between *intentionality* and *intention*) consult (Allott, Lohndal, & Rey, 2021), (Rey, 2003), (Rey, 2020), (Rey, 2020) (Adger, 2021), (Hale, et al., 2022). Intention here refers to speaker intent in formal sentence construction, and not the situational intent of some external participant in a semantic representation. It is the decision, for explicit purpose, to take an effectuating action in the structuring of a sentence. All references to intent here include both the concept of purpose and a decision in a syntactic function for ensuing structural action.

interface is unsurprising, since otherwise it remains stranded and unutilized, by virtue of lacking inputs.

While generative grammar has oriented to a theory of form, the relation of form to function has been clarified previously. (Newmeyer, 1004), citing Chomsky extensively, documents Chomsky's openness to a role for functional factors.

PG proposes only a simple input extension to the generative paradigm: each grammatical tool is conceived as a purposeful (and formalizable) device for specific structural effect in the process of utterance generation, distinguished from the traditional concept of a linguistic 'rule' by the explicit specification of intent added to the standard structural input and output conditions. This limits complexity to specific functional instructions which are directives for syntactic construction. They may be resultant from more general cognitive processing outside the syntactic domain, but they have been reduced to actionable input specifications supported by the syntactic component.

PG increases empirical robustness by enhancing traditional glossing and acceptability data. It uses explicit field transcriptions of evident user intent using a preliminary (pseudocode) vocabulary of observational features. This provides wider empirical coverage than records of meaning and acceptability alone since little use has been made of the fact that speakers can often supply a description why a linguistic form is used. Observations about linguistic intent can be elicited and refined as a controlled vocabulary for describing the functions underlying language structures.

Given functional purpose for specific constructions, a hypothesis arises, whether prior natural constraints on the inter-compatibility of structural tools can render some constraints on structural syntax unnecessary. Unacceptable sentences can potentially reflect the incompatible misapplication of tools where purposes conflict. Some unacceptable sentences are precluded if incompatible intent prevent their instigation at in the first place.

PG associates a functional/utilitarian facility with the concept of Instrumental Creativity, the process of innovating morpho-syntactic constructions for particular functions. For discussion of this aspect of creativity consult (reference anonymized).

A central goal of PG is connecting purposeful intents with processes of structure formation to discover high level disciplines and strategies of language for managing complexity, uncertainty, integrity, consistency, information density and other cybernetic principles of information representation and transfer. PG provides a framework for regulation of structural formation in a higher-level explanatory context.

Management of uncertainty enhances linguistic analysis of reflexives, and improves the conceptual underpinnings of generative syntax by integrating the essential role of function.

## 2.4. Actionemes as Pseudo-Code

Conceived as sets of individual features, PG uses a pseudo-code notation for "actionemes", which are clusters of properties that represent linguistic purposeful intents in a domain of

testable psychological reality. These hypotheses are represented using dollar sign symbols in the form ‘\$x. They are working place-holders for elements in a more detailed formal feature system. Pseudocode allows higher level discussion of structure, process, organization and architecture without falling prematurely into distracting details at lower levels. <sup>3</sup>.

### 3. The Step-wise Rationale and Justification in the Classic Analysis

In this section we demonstrate an analysis of reflexives based on the purpose of managing complexity, in contrast with the purely structural tradition of the classical generative analysis. This places the alternative in the context of the foundation for a long and varied tradition. For a review consult: (Harbert, 1995) (Dana Cohen, 2018) (Reinhart & Reuland, 1993). The history of unanswered questions, controversies and suspended issues reflects the many unresolved or discontinued lines of inquiry. These share a historical and theoretical basis and recapitulate the same fundamental principles orienting to foundational dependence on Chomsky’s original treatment (Chomsky, 1981) that has persisted.

***Note: In the following, readers can optionally ignore the formalist technicalities of the classical analysis (SBT) and follow only our preferred reanalysis in simpler functional terms, which is the substance of this paper.***

We use the original work and recent materials for organizational reference to represent the core orthodoxy of reflexivity studies. (Richards, 2018) (Bhatt, 2001) We build on this classical/standard binding theory to show beneath it underlying functional principles.

#### 3.1. Step 1: The Standard Analysis and Functional Purpose

We refer to the thematic commonalities of “Standard Binding Theory” (SBT) for contrast with PG hypotheses. The traditional factored argumentation is available, for example, in syntax course materials at MIT. (Richards, 2018)

A simple pair of examples is used to introduce SBT, adapted from Chomsky’s original paper (Chomsky, 1981):

- (1) John criticized himself.
- (2) John criticized him.

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<sup>3</sup> Actionemes are preliminary shorthand for a feature and function formalism. Pseudo-code is useful in system architecture for discussions on alternative approaches prior to formalization and implementation. They often require phrases and reflect some limited internal complexity, suggesting the possibility either of a form of feature representation or of embeddable function representation. We leave an open question how they might best fit into the merged tree structures that result from lexical selection and merged assembly into larger units.

In 1, the anaphor *himself* refers to John in self-criticism, while in 2 the pronoun *him* does not refer to John, although it can do so under different conditions:

(3) Mary criticized him.

The SBT analysis lies exclusively within configurational structure:

#### SBT Structural-Configurational Hypothesis (SBT-SCH)

“... there's something crucial about the structure of (2) that makes it impossible for *him* to refer to John there”

We refer to this as the Structural-Configurational Hypothesis. It is both insightful and *prima facie* valid at its level of analysis, but we note there is only an assumption and not an argument that nothing beyond structure is at play in the competence of linguistic expression for such referring terms.

We contrast this limitation with the hypothesis that there is an additional class of observables that can be incorporated in the analysis. We can ask what the speaker is intending to do when s/he includes a word, morpheme or structure. What does the speaker intend when the word *him* or *himself* is chosen? The speaker has done something; it is a linguistic action, from some specific intention, and not just an amorphous side effect of linguistic structure. The alternative choices reflect a decision somewhere in the expressive process. A sub-system is available here in the domain of purpose, and linguistic analysis is not complete without inquiring what that purpose might be.

We refer to this complementary perspective as the

#### PG Intentional Construction Hypothesis (PG-ICH)

Syntactic theory can be enhanced by the incorporation of features of linguistic action intention as input to sentence formation rules

### 3.2. Step 2: Intention to Efficiently Reduce Uncertainty

The SBT analysis continues with complementary distribution in the previous basic sentences:

(4) John<sub>i</sub> criticized himself<sub>i/\*j</sub>

(5) John<sub>i</sub> criticized him<sub>\*i/j</sub>

In (4), *himself* must refer to John and not to anyone else. In these empirical beginnings, there is a philosophical bent. Syntacticians subtly commit to a view of grammar wherein unacceptable sentences must be ruled out in exclusively configurational terms with optimistic disregard of prior psychological context. But this excludes an element of data, the obvious presence of intention. The framework can be empirically enhanced beyond grammatical configuration by considering additional data.

There is an opportunity for bad sentences to be ruled out in case they would never be generated in the first place, lacking compatible intention in prior cognitive processing. Certain features of structure may not co-occur if precluded due to mutually exclusive purposes. These become a formative impossibility, of themselves, a defective co-occurrence. We make the essential distinction between what cannot be said and what would not be said.

### Intent Preclusion Thesis (PG-IPT)

Some unacceptable sentences, which otherwise would need to be excluded from generation on a purely configurational/structural basis, are preferably more simply precluded by principles that involve conflict in features of structural intent and purpose.

In the following, SBT would specify that the anaphor *himself* cannot co-refer to *I* as a form of generative filter when features of person and number do not match, whereas under the IPT the former might never be introduced, lacking as it does a functional purpose.

(6) \*I<sub>i</sub> criticized himself<sub>j</sub>.

The purpose of reflexivization is to clarify messaging by flagging identical reference so there remains no functional purpose when the elements already differ manifestly in person/number (1Sg vs. 3Sg) and therefore lack identical reference.

SBT formulates a static principle, for application after the fact of potential co-occurrence, as follows:

### SBT Principle A (preliminary)

An anaphor must have an antecedent.

In contrast, we observe that the basic function of the anaphor *himself* is to reduce potential ambiguity and uncertainty in the context of a conventional assumption of default local non-coreference, unless specifically indicated.

To illuminate the role of uncertainty in syntax, consider the situation where a language might lack reflexive marking. If there were not reflexive forms, speakers would be faced with severe confounding ambiguity in the form of homophonous utterances:

(7) John<sub>i</sub> criticized him<sub>i</sub>

(8) John<sub>i</sub> criticized him<sub>j</sub>

Or, to push the point to an extreme, involving also case and position, one might even imagine ‘He criticized himself’ rendered as ‘He he criticized’ [or even ‘It it criticized’]. Such would be the mounting uncertainty as intentional tools for uncertainty management are removed in imaginary experiments.

The additional observation that reflexive anaphors are intentionally introduced in order to

reduce uncertainty is already an empirical enhancement of theory, relative to SBT muteness on functional purpose. In PG there is an Anaphoric Principle from the perspective of utility and intention of the linguistic system. It is as evident as it is essential.

#### PG Anaphoric Purpose Principle (APP preliminary)

The anaphoric reflexive forms are introduced with the intent to clarify that pronoun reference is to a particular antecedent nominal in contrast with a default assumption/expectation of no local co-reference, implemented for the purpose of managing uncertainty.

Efficiency and probabilities are involved here in the management of uncertainty. There is a reliable default assumption/expectation that an anaphor and referent are more likely not to co-refer than to co-refer. This provides efficiency because marking is only required in the fewer exceptional cases, in order to clarify intention. Absence of co-reference is deemed more probable so needs no explicit expression. A simplification of output signals is achieved. This is the

#### PG Default Assumption/Expectation of No Co-reference in Reflexives

Elements are assumed not to co-refer since this is the most likely probabilistic state of affairs. This is a default assumption/expectation that enables efficient marking only of exceptions.

This follows from a general principle of efficiency for managing uncertainty:

#### PG General Principle of Efficiency

When opposing expectations have one higher than the other, it is more efficient to mark the lower one than the higher since that reduces the length and complexity of the output signal.

### 3.3. Step 3: Explaining Locality and Scope

Next, following the logic of SBT, we consider locality conditions for reflexives:

(9) \*John<sub>i</sub>'s mother criticized himself<sub>i</sub>.

SBT anaphora must be restricted not to appear when too far structurally removed from the antecedent, here by virtue of being embedded inside a subject. The SBT solution is to introduce a configuration constraint roughly precluding positions more distant than through the structural sister. This is the widely potent concept of C-command that is pervasive in SBT and elsewhere:

#### **SBT C-command**

A c-commands B iff every node dominating A dominates B.



A refinement is necessary: For the relationship to hold A must not dominate B, nor vice versa. Thus B must be the sister or within the sister of A. This formalistic detail is essential for the concept to operate as intended, but is also revelatory of further significance. The adjustment shows that what is at stake is not some concept of inclusion but of immediate cognitive juxtaposition at a particular level of hierarchy. For PG, this involves the structural act of predication, as we shall propose, effectively bringing the concept of subject/predicate into the analysis.

The SBT-C-Command penetrates, and is effective, as far as it goes, but it is less than fully explanatory. Why should C-command be operative? Tellingly, any relation to a syntactic sister reflects the fundamental linguistic act of direct predication, that is, an intentional assembly of elements typically merged from the lexicon (including morphological components) around a predicate nucleus. We can formalize this observation as follows:

#### PG Merged Constituency Thesis

Merged elements in a structural sister relationship reflect the intent to predicate, namely to configure a super-element by application of one element to another. Merge is an operation which effects an action we notate in pseudo-code as \$InsertPredication.

For the SBT, the antecedent must c-command the co-referential anaphor, and the commanding co-referential DP is said to bind the commanded one. This bounding domain accounts for the accessibility limitation when using purely structural (configurational) information.

To account for the previous example, the SBT Principal A is anchored:

**Principle A (adjusted)**  
An anaphor must be bound.

**(i.e., by a C-commanding antecedent)**

SBT effectively identifies syntactic factors in the levels of data structure, but functional information is progressively disregarded (or sidelined) in the process. Principal A can be enhanced in PG by including the evident functional facts of intention.

#### General PG Principle of Scoped Insertion for Reflexivity

Restrict reflexive marking of a pronoun to a co-referent nominal in the restricted local domain of its predication sister operates functionally to limit the range of possible nominals available for interpretation to a severely constrained scope of relevance.

#### Corollary

Do not attach a marker outside this scope of predication since, beyond the domain where a default assumption of no co-reference is a proper expectation, uncertainty of reference

becomes combinatorially unmanageable. In an unconstrained domain allowing increased numbers of predicate arguments.

Using the functional approach restricts reflexivization to local clauses, but can now be understood in terms of functional utility. C-Command itself is explained. The predication is the functional unit of structural computation. It captures the C-command generalization at an elevated level of explanation. The validity of the Default Assumption/Expectation of No Co-reference would be untenable as a dominant likelihood when the scope of expectation is widened and a surfeit of additional nominals become available for reference interpretation. Combinatorial multiplication defeats uncertainty management.

Despite partial similarity, this principle is not a notational variant of Principle A since it involves an enhanced architecture where purpose injects itself directly into syntax using a criterial measure of uncertainty. Specification of purpose is not part of Principle A, which does not involve counting nominals to manage uncertainty.

This approach subtends use of an exclusively configurational/structural process in order to crash derivations. Instead, for simplicity and efficiency, reflexive features are introduced where needed for purpose as a result of structural intent. Preclusion replaces post facto filtering of promiscuously productive over-generation.

### 3.4. Step 4: Functional Analysis Beyond the Concept of Binding Domain

Continuing along the SBT argument sequence, it is necessary to account for the following:

(10) \*John<sub>i</sub> thinks that I like himself<sub>i</sub>.

So far, SBT has no means of explaining this unacceptability since the antecedent c-commands the anaphor, but it is significant that they are further separated here than in the foregoing. There is some limit to the permissible distance when considered in structural terms. This is known in SBT as the binding domain of the anaphor.

#### **SBT Principle A** (refined again)

An anaphor must have a binder which is in the anaphor's binding domain.

This presents the essential problem of defining the extent of the binding domain. The solution in SBT is insightful, to the depth it penetrates, orienting to the most immediate smallest tensed sentence, i.e. the local tensed phrase, TP: (Norvin, 2019)

#### **SBT Binding domain** (preliminary)

The binding domain of an anaphor  $\alpha$  is the smallest TP dominating  $\alpha$ .

This is satisfactory in the previous example, and for a sentence such as the following, in which himself, under a standard SBT analysis, would remain subject of the lower complement and have access to John in the higher and most immediate TP:

(11) John<sub>i</sub> believes himself<sub>i</sub> to be smart.

But this leads to a subsequent problem because it entails wrongly that e.g. the following would be well-formed:

(12) \*John<sub>i</sub> believes me to like himself<sub>i</sub>.

So, if afforded only structural solutions, we must account for the observation that e.g. himself can be in a different clause from its binder if it is subject of its clause. This is handled in SBT as follows:

### **SBT Binding domain** (enhanced)

The binding domain of an anaphor  $\alpha$  is the smallest TP containing  $\alpha$  and a DP which c-commands  $\alpha$ .

This measure affords special behavior in the case where the anaphor is at the level of the subject position. It also brings in tense as a variable. It operates only on structure, however, without provisioning a functional explanation. It is a descriptive account extracting a generalization from the form of the externalized utterance data without any reach into functional workings, which evidently must be essentially at play in any decision/process by the speaker to utter a reflexive.

This situation draws special attention to the use of tense as a conditioning factor. Lacking an explanation why tense might come into play, it can nevertheless supply descriptive (configurational) utility. It correlates with reflexive in the context of a lack of surface subject in *to* complements such as *Al wants to calm himself*.

Contrasting the PG framework, *John*, as the covert logical subject of *calm*, is permitted participation in the reflexivization process; there is no need for tense since there is no motivating necessity. Because a speaker must hold in mind the logical subject, the simplest assumption is that a covert subject would be available to reflexivization. An extra burden is incurred by the opposite assumption, with the onus to support that it must be held. We therefore assert a general principle:

### **PG Covert Logical Element Principle**

Linguistic actions to implement structural intent can be conditioned by covert logical operators such as understood subjects that do not appear in the string of output formatives.

This handles the current cases without further specification.

A need for this flexibility is evident in the following, where reflexivization occurs twice, triggered by both a grammatical and logical subject.

(13) Al appealed to himself to help himself.

(14) Al hypnotized himself to help himself.

Following the lines of SBT logic, as we consider in parallel the functional formulation, we have accounted for the data recapped below:

- (1) John<sub>i</sub> criticized himself<sub>i</sub>
- (5) \*John<sub>i</sub>'s mother criticized himself<sub>i</sub>.
- (8) \*John<sub>i</sub> thinks that I like himself<sub>i</sub>.
- (10) John<sub>i</sub> believes himself<sub>i</sub> to be smart.
- (12) \*John<sub>i</sub> believes me (Tom<sub>k</sub>) to like himself<sub>i</sub>.

In addition, we have accounted for missing surface subjects as in the following:

(15) Al wants to calm himself.

SBT appears, in contrast to PG, neither so simple nor so unified a solution.

We are separated in this progression of SBT logic from the central question of intent, why the configurational pattern should be as it is, and conclude from greater complexity that it does not operate at the optimum level of analysis. The higher functional context is not considered. Why is the domain limited to the local superordinate TP? Why the restriction to contain a subject? The SBT insights are descriptive, with partial insight per the data, but forego the further step to achieve a higher level of explanation in a functional context.

The controlling functional factor is that each level of sentence embedding brings the possibility of additional nominal DPs, and each of these, were there no constraints, could introduce new nominal candidates for pronominal antecedence and potential ambiguity. Constraint is necessary because, otherwise, the reflexive mechanism to reduce uncertainty would have the effect of introducing paradoxical uncertainty of its own by the possibility of accumulating additional potential references. We postulate a general principle:

#### PG Linear Uncertainty Meta Principle

A mechanism for reducing uncertainty is inhibited by introduction of a secondary countervailing uncertainty about how the primary mechanism is to function. In managing one level of uncertainty, refrain from introducing others.<sup>4</sup>

This explains why C-command, or any analog, is operative: it excludes the possibility of uncertain co-reference to nominals outside a context of immediate relevance. Syntactic recursion without constraint threatens the interpretability of coreference if access is permitted

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<sup>4</sup> We word this principle as we do because in the domain of human linguistic function it may be variable for each language how much uncertainty it aspires to manage beyond some minimum serving as a baseline.

to nominals in unlimited structurally remote locations. Uncertainty of reference explains the utility of C-command in reflexives.

Although tense is not required to handle the previous cases, the following require further discussion.

(16) Al believes himself to be safe.

(17) \*Al believes that himself is safe.

While the second example is ruled out in SBT because *himself* is in a tensed complement but lacks a DP C-commanding it, the first is only permissible because *himself* is deemed the subject of the complement. This is only tenable in SBT by virtue of the Exceptional Case Marking hypothesis whereby *himself* is understood to look like a direct object, to position itself like a direct object, and to act like a direct object, but is nevertheless analyzed as subject of the complement despite contrary object marking. Note that passivization stands to challenge this formulation:

(18) Al believes Joe to be safe.

(19) Joe is believed to be safe by Al.

Here we have a hypothesis that is plausible from a configurational perspective but is complex and exceptional compared to the more straightforward PG analysis. We take it simply to be the case that these DPs, originating as logical subjects, have been promoted also to be grammatical objects of the matrix verb.

As a consequence of this characterization, the anaphoric patterns become direct consequences of our simpler account of reflexivization. The pronoun is the co-referential direct object of *believes*, with Al as subject, so the reflexive is inserted per regularity of co-referent pronouns within clause predications.

This section illustrates how, by adding empirical data of purposeful intent, and considering the function to manage uncertainty, the classical generative analysis can be simplified and enhanced.

### 3.5. Step 5: Eliminating Ad-hoc Conditions

Next, following SBT logic further, to cases where the anaphor is the subject of an embedded tensed finite clause, we encounter examples such as:

(20) \*John<sub>i</sub> believes that himself<sub>i</sub> is smart.

The SBT without modification initially gets the wrong result here. The anaphor *himself* is inside an embedded TP, but it doesn't contain a DP that c-commands the anaphor so the embedded TP isn't identified as the binding domain. The predicted binding domain is the higher sentence so the example should be well formed.

SBT handles this case by adding a second special purpose condition as an ad hoc adjustment:

#### SBT Binding domain (adjusted for finite clause)

The binding domain of an anaphor  $\alpha$  is:  
if  $\alpha$  is the subject of a tensed TP, the smallest TP containing  $\alpha$   
otherwise, the smallest TP containing  $\alpha$  and a DP which c-commands  $\alpha$ .

This provides an account by means of two conspicuous and idiosyncratic conditions for particular situations. These, despite descriptive effectiveness, do not have the optimal simplicity of a fundamental generalization.

We are similarly faced with explaining this pattern in PG, but find it already addressed by the previous principle. Reflexivization in the sentence is excluded because it would span the barrier across predication.

### 3.6. Step 6: Re-analyzing Agreement as an Artefact Reflecting Incompatible Intentions

To further examine the configurational framework, consider the following sentence in the context of agreement rather than tense alone:

(21) \* John<sub>i</sub> said that himself<sub>i</sub> is clever.

It is useful briefly to summarize the protracted literature on how to exclude such a configuration. This can be tracked back from (Woolford, 1999) through (Rizzi, 1990) etc. The first approximation might seem to be that tensed clause subjects can't be reflexives, but these do occur in other languages. Factors that have been proposed include the Empty Category Principle, and, subsequently, agreement, leading eventually to Rizzi's Anaphoric Agreement Effect, whereby anaphors cannot occur in agreeing positions. This insight enjoys considerable empirical support from the examination of a variety of languages. The latter differ in their agreement processes, but positions lacking agreement are permissive. It's not that there are no nominative reflexives as it superficially appears, but that they are tripped up when there is agreement. We note, however, that the proposed mechanisms vary widely in detail, reflecting the difficulty in weaving a broad generalization from a surfeit of disparate devices. We take from this that another level of analysis holds promise.

Again, this work does penetrate dramatically toward a basic understanding. The crucial remaining question is: why does agreement repel reflexivization? In the PG approach, an obvious answer emerges. Agreement itself is evidently a strategy to reduce uncertainty in communication via explicit marked redundancy: by definition, the same agreement information is present in more than one place in the sentence. This leads us to a principle to explain the Anaphoric Agreement Effect:

#### PG Multiple Implementation Principle

When two grammatical strategies are available to reduce uncertainty, there can be

constraints on their simultaneous application in a structure, not just because there is less impetus beyond a primary reduction of uncertainty, but because the implementational specifics of two strategies may introduce complexities, uncertainties, and demands on computation that work against the functional motivation to reduce them.

The functional analysis of reflexivity leads again here directly into a more basic understanding in terms of management of complexity and resultant uncertainty.

We have amplified generative analysis by considering function beyond the structural requirement that a reflexive pronoun takes its antecedent in the TP domain of the closest subject. An implication of this captures the essence of the definition of Binding Domain in SBT while adding a functional explanation. Here is a summary:

#### PG Informal Reflexivization Definition/Rule (Non-Exempt)

(Non-exempt) Reflexivization is insertion of a morpheme marking co-reference to reduce interpretational uncertainty by signaling the cancellation of a default assumption of no co-reference. It operates local to the clause, and is sensitive to the logical subject. It is in competition with agreement as a strategy for reduction of uncertainty.

This bypasses the complex configurational explanation and embeds both requirements of close proximity and the functional motivating context. It precludes object binding across a subject to a higher TP since the local subject would otherwise intervene as an alternate candidate increasing uncertainty. It adverts to eligibility in subject position as the optimum case of reference without uncertainty. The essential notion of reflexives is optimized search for the antecedent limited to the locus of the local clause (e.g. nearest subject) emanating from a functional perspective. It adverts to the higher logic of the SBT since there is no coherent concept of co-reference without a domain.

We have not yet addressed less basic cases, where, for example, in the context of some representation such as a picture, TV, book, etc., reflexives do not reach to the local subject but further afield. By way of preview, following has an indirect object co-referent with the direct object:

(22) Looking at the picture together, Al pointed out (showed) Tom<sub>i</sub> to himself<sub>i</sub>.

Here again, we observe the evident role of logical relationships not directly represented in syntactic form. This case is covered by observing that when Al pointed or showed for Tom, that, necessarily, Tom saw himself, in support of the functional analysis at a level beneath the surface syntactic where Tom is not superficially a subject. This general observation, that logical relationships can drive function will be a key to understanding the “exempt” uses of reflexive that don’t adhere to the classical treatment of Principle A. We discuss these later.

#### 4. General Evidence for Divergence from Default

In the following we further develop the idea that reflexives, even those not adhering to the SBT, reflect the presence of an assertion that carries a contrast with some conventional implied default

group (which may be empty). This reinforces the thesis of divergence from default to manage uncertainty.

#### 4.1. Haspelmath's Analysis and Uncertainty

(Haspelmath, 2008) provides independent support for our approach from within a different line of investigation. Haspelmath correlates frequency of occurrence with patterns of reflexivization in a variety of languages. Here are the data and stated effects for one of the most illuminating of the phenomena he discusses :

Russian contrasts so-called introverted (usually self-directed) and extroverted (usually other-directed) verbs in a way not seen in languages such as German. This is seen in (1)-(2).

##### (23) Russian

- a. Vanja moet-sja.            (#moet sebja)  
    ‘Vanja washes himself.’        (‘washes himself’)
- b. Vanja nenavidit sebja (\*nenavidit-sja)  
    ‘Vanja hates himself.’

##### (24) German

- a. Gertrud wäscht sich  
    ‘Gertrud washes (herself).’
- b. Gertrud hasst sich.  
    ‘Gertrud hates herself.’

Russian, reflexive -sja is used with introverted verbs like ‘wash’ while extroverted verbs like ‘hate’ use the reflexive pronoun sebja

We glean an important observation in the following excerpt from the paper:

##### Universal 1

In all languages, the reflexive-marking forms employed with extroverted verbs are at least as long (or “heavy”) as the reflexive-marking forms employed with introverted verbs.

Haspelmath documents this distinction in English, Russian, Hungarian, Greek, Turkish, Dutch, Frisian and Jamul Tiipay. Here is his functional account:



“The functional explanation has been stated clearly by (Haiman, 1983). It is the principle of economical coding of predictable information (“What is predictable receives less coding than what is not,” (Haiman, 1983, p. 807). But why exactly is the reflexive interpretation of introverted verbs predictable? I claim that it is the relative frequency of reflexive use of a given verb. If a verb is rarely used reflexively, marking it as reflexive is more important than if a verb is often used reflexively.”

This conforms with our thesis that lack of any (reflexive) marking corresponds to the more likely case, and consequently to a default assumption. Beyond this, the subsidiary point drawn by Haspelmath from previous work is important:

Introverted verbs are:

“verbs expressing *commonly* reflexive actions such as washing oneself” (Faltz, 1985, p. 8), as expressing “*normally* reflexive activities” (Faltz, 1985, p. 19), “actions which one *generally* performs upon one’s self” (Haiman, 1983, p. 803), “*stereotypically* reflexive actions” (Levinson, 2000, p. 329), or actions “*typically* or *conventionally*” directed at oneself (König & Siemund, 2000, p. 60) König; emphasis added in all cases).

Introverted verbs are more predictable and therefore require less coding for functional purposes. If we bring this back to English analogs, i.e. verbs such as *shave*, *wash*, *dress*, where the action is most often applied to one’s self, we find that the reflexive is unexpressed and implicit. This bolsters the conclusion that reflexivization is about management of uncertainty and depends on expectation of co-reference or lack thereof. Where coreference is expected in a contextual default assumption it is not marked for divergence: the reflexive is absent.

Next, we consider a set of exceptions to the SBT.

## 4.2. Evidence from SBT Counter-Examples

In this section we consider range of data for marginal constructs which extend beyond the aspirations of the SBT. The following data is from (Parker, 1990)

### 4.2.1. Absence of Explicit Antecedent

SBT is intended to handle triggered pronouns in the sense that a “triggering” syntactic antecedent is present in syntax, yet reflexive forms do occur without an overt anaphoric precedent.

In the following, untriggered pronouns that are unacceptable as single nominals become acceptable when conjoined, or found occurring in prepositional modifiers of generic NPs. These data draw attention away from pure syntax as the proper exclusive level of analysis since there is no overt antecedent. Untriggered reflexives involve an implicit comparison with either a default or a neutral expectation. There is an abiding default assumption of no reference to the understood first and second persons in the following sentences.

Untriggered pronouns that are unacceptable as subjects or direct objects become acceptable when conjoined:

- (25) \*Myself wrote to the Chairman.  
(26) Myself and others wrote to the Chairman.

The latter conjunction creates, by means of a simple algebra, implicit contrast with others alone as the neutral expectation.

Similarly, the untriggered reflexive is less acceptable in simple prepositional phrases than when in a position modifying a generic nominal for comparative effect.

- (27) ?There are groups for yourself.  
(28) There are groups for people like yourself.

The latter introduces a “delta” difference carrying a contrast with “people not necessarily like you” as the neutral expectation.

These phenomena bolster the idea that reflexivization is not mechanistically syntactic but more functional, involving here the linguistic action of comparison with an inexplicit, understood element. The reflexive is acceptable when there is an implied contrast with the extension of default assumption of no co-reference to an understood element of comparison.

#### 4.2.2. Implicit Contrast in Passives and Datives

Consider the following examples, involving again implicit contrast. We have seen that the first sentence is properly excluded in SBT by an adjustment in the binding domain.

- (29) \*Al believed that himself saw Sue. (and not another)

This sentence has himself in a subject configuration and is outside the PG binding domain. Consider the following, which can be perceived as relatively acceptable even without particular contrastive stress.

- (30) Al believed that Sue was seen by himself (and not another)

We need an explanation for this difference. There is apparent relevance in that it exhibits unspecified agentive perspective (Sue was seen) achieved by passivization, the advancement of the patient to subject position, and placement of the agent in a separate oblique phrase. Given the displacement of the agent, and its optional and separate reintroduction in a prepositional phrase, we have *prima facie* evidence that two operations are involved. It is natural to postulate *by himself* as a supplementary separate action/predication.

Given structures such as:

- (31) The car was given him (by Sue).  
 (32) Sue gave him the car.

a *to* phrase is required with the anaphor embedded:

- (33) Al believed that the car was given (\*to) himself (by Sue).  
 (34) Al believed that Sue gave (\*himself) the car (to himself).

We posit the *by* and *to* phrases as added sub-predications resulting from separate intentional predication actions. This removes them as direct arguments in the primary predication. Similar observations are possible with other prepositional constructs such as *lend ... through*. Without these subordinated adpositions, the structure corresponds to a primary verbal argument in the basic predication, which is subject to a default assumption of no co-reference within the local syntactic predication.

The acceptable cases with *by* and *to* significantly involve a contrastive meaning, with the default expectation belied by contrast. These cases have in common with the standard within-clause uses of reflexive, the notion of overriding a default expectation. This is the core basic feature of reflexive forms. The cases with *by* and *to* differ in that the expectation to be overridden depends on an extended contrastive expectation, rather than a syntactic within-clause expectation of no co-reference used to manage uncertainty at the syntactic level. This enables us to hypothesize a general principle of reflexivity:

#### PG General Principle of Widened Reflexivity

A basic reflexive form is introduced to indicate that a default assumption of no co-reference is to be over-ridden. This assumption can be managed either within the immediate syntactic context of a predication, or widened to include an extended (contrastive) context.

### 4.3. Archaic Examples

We have seen that the facts of reflexive usage include the purpose of contrasting with some separate group or entity for which membership might be presumed as a default. Early in the language, there has been this clear implication of “as opposed to”.

- (35) “He cannot by all the arts and methods he useth heighten mens sinfull corruption to the same degree of malice and madness against God, that himself is guilty of.” (Ford, 1600s)

- (36) (Deuteronomy 18:9-14, n.d.)  
 But there was a certain man, called Simon, which before time in the same city used sorcery, and bewitched the people of Samaria, giving out that himself was some great one

### 4.4. Hiberno-English

Well-known Hiberno-English uses of reflexive were likely influenced by the Gaelic substrate,

e.g. “Is himself home?”. These connote an idea of either objective or self-importance and are subsumed under the set of reflexives that can be attributed to contrast with a default group. The idea here appears to be one who sets himself apart from others in self-regard, i.e. again “as opposed to”.

#### 4.5. Real World Prescriptivist Examples

It’s useful to consider random sources of data, as opposed to sets curated in some particular theory. Latter day prescriptivists reveal varied uses of reflexives by collecting the usages they disapprove of: (Dictionary, 2019)

- (37) The MDA and ourselves have taken the scale of the festival to a higher level. (As opposed to the MDA alone.)
- (38) Whether yourself or the NYT like it or not it is the owner of the computer who states what is run on their own system. (As opposed to the one who should.)
- (39) He came over to greet Linda and myself. (As opposed to Linda alone.)
- (40) If any readers would like to join our band of volunteers could they contact myself as detailed below. (As opposed to anyone else.)
- (41) He came over to greet myself. (As opposed to anyone else.)

All of these have the flavor of “as opposed to (the others)”. Given diverse usages, it is clear that there are a variety of configurations and factors that allow a nominal to be tethered by reference to a binding DP external to it, implicit or explicit. This unitary function is multiplexed into a diversity of constructions.

#### 4.6. Optionality and Non-complementary Patterns

Multiple analysts have noted that reflexive forms can be optional and therefore not in complementary distribution with non-reflexive ones per the standard cases of the SBT analysis. This creates tension in the SBT, which depends essentially on mutual exclusivity.

Here are example alternations (Newson, 2018) reflecting the override of default expectation of other than self.

- (42) Bill saw a picture of himself/him in the newspaper.
- (43) No one knew, except for Bill and me/myself.
- (44) Mary found the diamond near her/herself.

In each case there is an optional implication that a contrast is drawn with an implicit default individual/group, according with the PG analysis.

Following is a set of examples from (Reuland, Reflexives, 2014), attributed partially to Ross (1970) and (Chomsky, 1981), also countering the complementarity theory.

- (45) Max expected the queen to invite [Lucie and him(self)] for a drink.
- (46) It angered him that she ... tried to attract a man like him(self). (Zribi-Hertz, 1989)
- (47) John saw a snake behind him /?himself

Reuland rejects any analysis wherein e.g. *himself* is alternatively an emphatic form of *him* to leave a conundrum explaining how the emphatic form is prevented in positions where local binding is demonstrably operative. He concludes that in one way or other reflexives must be somewhere marked as reflexives in a configurational analysis. This falls short where explanation is not provided and just descriptive accounting has been achieved.

Issues are resolved when reflexives are seen as actions to override a default assumption of “no (specified) co-reference”. The solution falls out as a specification that reflexive forms are conceptually triggered in two cases:

#### Basic Versus Extended Reflexivity

- An action to override the assumption of no/unspecified co-reference imposed on the syntactic clause as a convention for reduction of uncertainty
- An action to override an assumption of no/unspecified co-reference for a particular situation.

Examples are cited also in (Bhatt, 2001)

(48) John<sub>i</sub> saw a snake near him<sub>i</sub>/himself<sub>i</sub>.

(49) John<sub>i</sub> thinks that pictures of him<sub>i</sub>/himself<sub>i</sub> will sell well.

These examples show the common feature of all reflexives to override a nonidentity assumption, quite extensible to the notion of contrast. This commonality does not fall out as a single generalization in SBT, which must on complex cognitive disjunctions of structural features.

Bhatt, considering earlier literature (Chomsky, 1981) (Reinhart & Reuland, 1993), cites further non-complementary examples:

(50) Bruce thinks that [ [a beautiful picture of himself/him] is hanging on the outside wall of the gym].

(51) They heard stories about them/themselves.

These reflect the prevalence in the literature questions about whether any fully generalized configurational solution is fully explanatory. The lack of determinative outcomes based on the SBT supports the theoretical impetus to shift to a functional level of analysis.

## 5. Casting the Wide Net to Exempt Reflexives

### 5.1. Introduction

In this section we utilize (Van Hoek, 1997) as a resource to validate our hypothesis against a wealth of cases and examples from the literature. These involve point of view (POV), logophoric perspective, and other areas beyond the core basic data sets.

The PG functional perspective differs from Van Hoek’s “cognitive linguistic” approach,

which leads investigation in a useful direction, toward mentalist categories beyond configurational features, but effectively does not achieve a unified solution, leaving a diverse and complex matching of patterns, based on a multiplicity of disjoint disjunctions.

We use it as a data resource to test a theory of reflexives since it revisits a wide range of examples. Our aim is to validate that a functional approach, based on management of uncertainty and the use of default assumptions, provides a simple, generalized solution across an expanse of data. Generalized coverage of the range of issues supports the claim that a shift in level of analysis to a functional approach can explain reflexivity in general, and why languages have reflexives in the first place.

Van Hoek's own account involves notes a long, complex list of mentalist categories. In a domain of cognition lacking primary data, these appear less testable and reminiscent of approaches motivating Chomskyan formalism from the earliest days. They include a daunting list that is hard to corral: proximity, prominence, contrast, emphasis, prototype, archetype, coreference, subjectivization, point of view, on/offstage, scene, animacy, logophoricity, constructional schema, super-schema, conceptual adjacency, schema extension, abstract closeness, constructional construal/viewing relation, goal/theme, landmark non-processual relation, cognizance, awareness, conceptual interconnection, semi-subjectivity, objective construal, discourse participant, on-stage participant, politeness, grammatical person, conceptualizer, deviation from scheme, empathy, self-referentiality, etc.

This multiplicity of factors is obviated in our functionalist account, providing instead simple unified and validatable factors that account for the patterns of reflexive forms across many types of examples. The contrast brings out the importance of our thesis that syntax is not driven by all of cognition, but by a narrow set of selected features presented to syntactic construction for functional purpose.

The utility here is not the cognitive mappings themselves, no matter how indicative of extra syntactic conditioning, but the collection of data, which serves as a testing ground for analysis.

We observe in this section that in each case, the reflexive marks an override of a statistically likely or natural default assumption involving the reflexively marked nominal. This validates our approach by showing its extensibility to many types of data.

## 5.2. Associating Data with Explanatory Default Assumptions

### 5.2.1. General

Van Hoek's data is a useful sample of the range of phenomena observed in exempt (from SBT) reflexives. In the following, we show in each case how Van Hoek's data reflects management of uncertainty based on divergence from some statistically likely assumption. This characteristic explains the distribution of reflexives. The default assumption is not restricted to non-co-reference, as in non-exempt SBT cases, but there is always divergence from some default assumption that is held commonly in the speech community, and therefore between speaker and hearer.

Van Hoek orients to three basic manners/markers of coreference:

- among arguments
- emphatic markers
- logophoric/POV indicators

These are illustrated in the following (Van Hoek, 1997, p. 171):

- (51) John saw himself.
- (52) John himself knows I'm right.
- (53) He sat down at the desk and opened the drawers. In the top right-hand one was an envelope addressed to himself. (David Lodge, *Changing Places*, p. 62); cited by Zribi-Hertz [1989])

This trifurcation is contrasted with our singular unified thesis that reflexive is introduced for the purpose of signaling an exception to a default assumption. These sentences, respectively, reflect suspension of the assumptions of 1) coreference with the subject 2) expected conformity to another's opinion 3) a standard expectation that one's self would not randomly be identified. There is a fundamental commonality. The data are also cross-classified, such that the categories do not segregate, since all three can be emphatic markers in the right circumstances.

The cases exemplify function, a single purpose, to indicate divergence from a standard default assumption. This reflects an abstraction underlying a linguistic contextual variation, dubbed early by structuralists as an *emic* category. The particular semantics are signaled, to be inferred in semantic interpretation, producing multiple *etic* contextual variants: \$ signalExceptionToDefaultAssumption.<sup>5</sup>

Lacking the core element, Van Hoek explains usages and variations by recourse to schemas that reflect the central semantic properties of two cognitive/conceptual prototypes (emphasis and POV) “developed from a central, prototypical construction in which the reflexive marks coreference between co-arguments of a single verb.” (Van Hoek, 1997, p. 172) This remains a structural rather than functional analysis, not relying exclusively configurational features, but structural pattern matching in combination with conceptual categories.

Van Hoek distinguishes emphasis from coreference between arguments of a predicate. (Van Hoek, 1997, p. 172) Cases characterized as emphasis, such as

- (54) Sally herself knows she needs a new job.
- (55) I myself have often eaten gefilte fish.

are associated with the characteristics of proximity (syntactically close to the corresponding nominal), prominence (of the corresponding nominal), and contrast against some (possibly unspecified) set of entities.

In PG, these three features need not be explicitly marked since they follow implicitly from reflexive purpose marking an exception to a default assumption. Evidently, the default community assumptions are that Sally does not know what others know, and one has not necessarily eaten what others have. The notion of emphasis derives from overriding the normal expectedness of the default.

Placement itself is variable in both sentences, as is prominence, considering the acceptable passive equivalents. The notion of prominence/contrast is not fundamental but implicit

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<sup>5</sup> We use these categories informally only to indicate contextual variation, without raising classic theoretical questions.

and derivable from the exception to the default assumption.

Van Hoek's second proposed prototype is based on SBT coreference of a nominal with another in the same predication (Van Hoek, 1997, p. 173):

(56) John cut himself.

(57) Sally saw herself.

Van Hoek associates these with characteristics of proximity and prominence, together with a subjectified referent (unable to view one's self as objectively as another person". (Van Hoek, 1997, p. 174) But proximity and prominence are not necessarily distinctive where new information may be in the subject or object and contrastive stress is an independent variable. a basic feature of subjectified reference is wanting for direct psychological validation and can be inferred from the core purpose of reflexive, to mark an exception to a default assumption, which is a subjective assertion.<sup>6</sup>

Neither of the two prototypes reflects the unified functional regularity. The requirement of more than one underlying factor itself exacerbates a lack of effective explanation. The cognitive analysis does point toward a unified solution but a proper generalization cannot be captured at the wrong level of generalization. Functional purpose unifies all the subcases in a single generalization.

### 5.2.2. Specifics

In the following we consider remaining examples of different subtypes of anaphora Van Hoek drew from the literature. In each case, these can be explained simply as signals that some default assumption is abandoned. It is left to the receiver to infer the particular assumption being overridden. We survey this data to validate the PG approach by indicating in each case what the underlying shared community assumption is. In PG these are full explanatory of the patternings.

Consider (Van Hoek, 1997, p. 176) :

(58) I can understand a father wanting his daughter to be like himself but I can't understand that ugly brute wanting his daughter to be like him.

Here, there are two default assumptions corresponding to the conjoined clauses: 1) Reflexive: everyone wants his/her child to be similar. 2) Non-reflexive: no one wants his/her child to be an ugly brute. (Van Hoek, 1997, p. 176):

(59) The adults in the picture are facing away from us with the children behind them.

(60) The adults in the picture are facing away from us, with the children behind themselves.

The default POV perspective is that of the speaker. The reflexive signals that this default perspective has been shifted. It does not reflect any alternative POV specifically, but only that it has been shifted, with the new locus to be inferred from the structure.

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<sup>6</sup> When the object (patient) is unexpectedly co-referent with the agent (experiencer), there is by definition divergence from any rote assumption that connotes influences from an external framework, interpreted as an outside objectivity.



When a nominal is inanimate, it cannot by definition have a POV, so the default assumption cannot be suspended. (Van Hoek, 1997, p. 176):

(61) The house in the picture is facing away from us, with an elm tree behind it.<sup>3</sup>

(62) \*The house in the picture is facing away from us, with an elm tree behind itself.

The following sentences reflect a context implying that a person should normally think about and take care of him/herself, and not just others. They are laden with an assumption that precludes use of a reflexive, which, contrary to intention, would signal that a normal assumption should be excepted. The default assumption is being promulgated rather than overridden is that one should think of one's self, as others might likely do. (Van Hoek, 1997, p. 176)

(63) I'm finally starting to think about me, and I've decided that I like me.

(64) You need to quit taking care of everyone else and take care of you for a change.

On the other hand, it is common to assume that it is best not to have hate for one's self, so that a reference to that feeling does in fact call for a reflexive exception indicator. (Van Hoek, 1997, p. 176)

(65) If you cut into a healthy body, you're going to hate yourself for the rest of your life.

(66) Hawkeye: I already hate myself. I hate me; I hate you; and most of all, I hate this war. (From "MASH"; cited by Ward [1983])

Similarly, between lovers, in certain relationships, there would not normally be such as war. The opposite case is signaled by reflexivity (Van Hoek, 1997, p. 177):

(67) Carmen understood. Between her first lover and herself, it was no longer tennis; it was war. (Rita Mae Brown, *Sudden Death*, p. 58)

Examples from the emphasis prototype can similarly be reduced to rejections of default assumptions.

For the following, it would be more common for another, as an intermediary, to talk to a third party, just as it would be more common for someone else to undertake some particular action (Van Hoek, 1997, p. 179):

(68) John wants to talk to her himself.

(69) You can do that yourself.

Similarly, one more often talks to/tells someone else about a person than that person him/herself (Van Hoek, 1997, p. 179):

(70) I talked to Bill about himself,

(71) John told Sally about herself.

One normally discusses and talks for the purpose of exploration with an interlocutor about

external topics, rather than about the person him/herself, since the object is to obtain an outside perspective. In contrast, the object of *explaining* is on a more objective or resolved basis beyond the process of exploration implicit in ‘discuss’ or ‘talk about’ (Van Hoek, 1997, p. 180):

- (72) ??I'm tired of people explaining me to myself.
- (73) \*Mary discussed John with himself.                      » /
- (74) \*Mary talked about John to himself.

Then for (Van Hoek, 1997, p. 181):

- (75) John put the books under him.
- (76) John put the books under himself.

Van Hoek analyzes as follows:

“In some dialects, the sentence [...] implies merely that John stored the books somewhere underneath him—perhaps beneath his chair. The most likely interpretation for [the second sentence], for some speakers, is that John sat on the books, using them to boost himself up, or else sat directly on them in order to conceal them. “

This brings out a default expectation that the location is generally, rather than directly underneath. Van Hoek also quotes examples from (Kuno, 1987):

- (77) John pulled the blanket over him.
- (78) John pulled the blanket over himself.
- (79) John hid the book behind him.
- (80) John hid the book behind himself.
- (81) John pulled Mary toward him.
- (82) John pulled Mary toward himself.

In all of these the more likely default expectation general location can be overridden in the case of direct adjacency.

In the following, the default assumption is that assessments of value and importance are more often based on larger context than specifics of one case. The reflexive form signals the departure from this norm (Van Hoek, 1997, p. 182):

- (83) This in itself is not a big deal.
- (84) That book by itself is worth millions.

For picture nouns, the reflexive marks speaker intention to signal that textual, verbal or visual creations generally portray something besides one's own person (Van Hoek, 1997, p. 182):

- (85) John recently read a book about himself.
- (86) Mary found a picture of herself in the paper.

There appears no need separately to specify cognizance or implicit verbs of perception, since these are built implicitly into the PG operation, where any holding of assumption involves cognizance. Here, against the default assumption of ‘other’, a person holds his/her own self to be involved (Van Hoek, 1997, p. 183):

- (87) Mary painted a portrait of herself.
- (88) Ralph sent Sally a book about herself.

The PG characterization is also evident in Kuno data, comparing when someone may or may not be privy to gossip or rumor (Van Hoek, 1997, p. 183):

- (89) John was asked about all that gossip about himself.
- (90) \*John was oblivious to all that gossip about himself.
- (91) John was oblivious to all that gossip about him.
- (92) Ironically, Mary owed her success partly to that scandalous rumor about herself that was going around.
- (93) \*Ironically, the book owed its success partly to that scandalous rumor about itself that was going around.

An assumption that gossip/rumor is not, per default, about someone else does emerge here when a person is made privy to it, due to the context of *ask* or *going around*. It is not, however, necessary to specify cognizance, since signaled assumptions, of necessity, imply cognizance. PG shifts the level of analysis away from the features of linguistic context to the realm of cognizance where assumptions and their applicability operate. An inanimate object cannot mentally override an assumption.

Another construction illustrating the POV reflexive is a configuration in which the possessor of a nominal antecedes a reflexive within a picture-noun phrase, as in (Van Hoek, 1997, p. 184):

- (94) Sally's story about herself
- (95) John's picture of himself

These simply illustrate that one's representations would most often be about another.

(Jackendoff, 1992) data has a subtlety in a case where “Ringo is the one in the middle [pointing to a set of wax figures] of the Beatles” p.184

- (26) The three surviving Beatles were touring the wax museum when there was a sudden earthquake, and Ringo fell on himself.

Here Ringo fell on the statue and it cannot be the inverse that the statue fell on him. This again shows that reflexive signaling is for a participant able to process assumptions, not for an inanimate object.

It is similar, if one accepts the data as intended, for examples from (Fauconnier, 1994) (Van Hoek, 1997, p. 185):

- (96) Nixon listened to himself singing to Mao.
- (97) \*Nixon sang a special cadenza to himself.

Van Hoek continues to consider logophoric reflexives in narrative and dialog contexts.

In the following, reflexives indicate that the speaker recognizes a particular consequence for a sentence participant that is exceptional *vis a vis* assumptions about what would happen within normal circumstances. (Van Hoek, 1997, pp. 186-7)

- (98) But aside from this, she was keenly conscious of the way in which such an estrangement would react on herself. (Wharton, 1905)
- (99) And that was exactly it, he thought. He really didn't care too much what happened to himself. (Highsmith, 1973, p. 79)

Where the content makes clear that there is no exceptional circumstance operating to override a default assumption, there is no reflexive. (Van Hoek, 1997, p. 187)

- (100) He sat staring ahead of him with bright blue eyes that seemed a little screwed up, as if the glare of the East were still in them; and puckered at the corners as if the dust were still in them. Some thought had struck him [\*himself] that made what the others were saying of no interest to him [\*himself]. (Woolf, 1937, p. 6)
- (101) She was not pretty, no, her size was against her [\*herself]. (Woolf, 1937, p. 46)

Reflexive predictably signals an unexpected consequence for one person *vis a vis* expectations for others. (Van Hoek, 1997, p. 187)

- (102) If Cassandra has filled my bed with fleas, I am sure they must bite herself.
- (103) But at the same time, she could not help thinking that no one could so well perform it as himself.

Per (Ross, 1970), there may even be no overt antecedent to the reflexive form when a statement is set against a default assumption *a priori* that others would be more likely to be involved. This emerges in second person examples where special consideration is given to the person being spoken to. (Van Hoek, 1997, p. 188)

- (104) Someone like yourself might appreciate these things.
- (105) We have received many letters from doctors such as yourself.
- (106) This book was written by Mary and myself.

There is special confirmatory evidence of control by exception to default assumption in cases where both the content and the syntax of the sentence pre-establish that an exceptional category is involved. This happens in the context of social insult or praise of the second person, where *people like* inherently suspends default expectations and obviates the reflexive. (Van Hoek, 1997, p. 190) It would be redundant and wasteful to again signal the exceptional state when it has already been established in the content of the sentence. This brings out the role reflexive has in processing efficiency.

- (107) People like you disgust me!
- (108) \*People like yourself disgust me!
- (109) \*With friends like yourself, who needs enemies?

This also explains why, in less direct contexts, ‘people like you’ may be deemed less polite or more insulting than ‘people like yourself’, since the implied exception connotes less of a stereotype. (Van Hoek, 1997, p. 189)

There is no point in marking exceptions when the sentence content and syntax already pre-announces a special case. (Van Hoek, 1997, p. 191)

- (110) \*Someone like himself might appreciate these things,
- (111) \*We have received quite a few letters from doctors such as herself,
- (112) \*This book was written by Mary and himself.

Further cases involving direct or reported speech illustrate that the operative factor for reflexive is to mark an exception to a general expectation. (Van Hoek, 1997, p. 191) from (Kuno, 1987):

- (113) May said this book was written by Tom and herself.
- (114) I told Albert that physicists like himself were a godsend.
- (115) In 1985, says Hefner, Leigh stole a videotape of a sexual frolic involving himself and some friends, thinking she could use it against him.
- (116) He said that the faculty tend to be cowardly about these things, himself included.

Examples focusing on reported speech reflect the social niceties of special exceptions for second persons, even when reported.

It’s widening of “present company excepted”. (Van Hoek, 1997, p. 191) from (Kuno, 1987):

- (117) According to John, the article was written by Ann and himself,
- (118) \*Speaking of John, the article was written by Ann and himself.
- (119) John said to Mary that physicists like himself were a godsend,
- (120) Mary said to John that physicists like himself were a godsend,
- (121) Mary heard from John that physicists like himself were a godsend.
- (122) \*Mary heard about John that physicists like himself were a godsend,
- (123) \*Mary said about John that physicists like himself were a godsend.

Apparent exceptions to the PG treatment of reflexives can have straightforward explanations from contextual conditioning. The first sentence below involves a reversed logic in which the speaker intends from the lack of a reflexive, to connote that s/he is not an exception to the general philosophy that people can be likeable. Similarly, in the second, the speaker is communicating that people do think about themselves, and it is okay, and that it isn’t an exception. (Van Hoek, 1997, p. 194)

(124) I like me.

(125) You have to think about you for once.

The functional signaling of divergence from a categorial norm depends on a variety of sources.

Reflexive is precluded when syntax and content provide a presumptive category on which reflexive is situated. The expression “no one” implies a group for which there are normative expectations against which the speaker may draw an exceptional contrast. (Van Hoek, 1997, p. 197)

(126) The music made her think of her life as it seldom did; it exalted her (\*herself)-

(127) The music made her think of her life as it seldom did; it exalted no one as it did herself.

### 5.2.3. General Observations

This survey of an extensive data sampling shows without exception that reflexive forms operate quite generally to signal that some assumption/expectation, shared by speaker and hearer, is overridden for an exceptional case. This arrangement operates to manage uncertainty in communication, making the output signal efficient since no marking is required in the most frequent circumstances, appearing only in the less frequent, less expected cases. It obviates the need for disjunctive lists of alternative cases in the cognitive grammar approach.

Some proposed contextual categories, e.g. Van Hoek's, can be contextually implicit in semantic interpretation from the functional specification. This validates Van Hoek's general orientation to cognitive features in the larger theme of a cognitive perspective. Nevertheless, the data, reducible to a single process at a different level of analysis, illustrate how a generalization can be missed if blind to functional goals. The multiplication of variants from the central principle reflects semantic widening of the variety that is common in linguistic change. One basic default assumption (non-identity of reference) is broadened to include a wide range of types of default assumption.

The PG analysis covers the basic classical non-exempt anaphor data involving four aspects of descriptive patterning: precedence, clause mate locality, C-command, and abstract subject relationship. It illuminates why these structural patterns would be as they are.

An important feature for Van Hoek is the hypothesis that the diverse range of observed reflexive usages reflects a basis in a few prototypes. PG recasts such abstraction in different material, the divergence from a default assumption of non-identity within a predicate. This itself is a prototype: all the extended varying uses of reflexive have in common that there is some divergence from some default assumption, even if it is not always that of non-identity of reference. This signaling of divergence, in general, is the central pole of the reflexive construction. Ancillary, secondary manifestations differ only in the particular default assumption. This recapitulates the concept of prototype, albeit in a different context at a different level of analysis.

## 6. Alternative Theories of Configurational Complexity

This section surveys two treatments which extend the classical theories by investigating phenomena in diverse sets and positing configurational apparatus for syntax or pragmatics. This apparatus contrasts with Purposeful Grammar, where theoretical benefits arise from simplified functional explanation, and any additional apparatus to configure generation is superfluous.

Head-Driven Phrase Structure Grammar (HPSG) (Pollard & Sag, 1992) delves deep into configuration, adding descriptive apparatus, while Gricean generalizations by Levinson (Levinson, 1991) build super-structure within the declarative apparatus of pragmatics. These contrast with Purposeful Grammar with a unified simplicity of functional explanation, compared to multiplexed disjunctive derivations. Without the probabilistic functional perspective of management of certainty, the generalization is missed seeking to extend configurational frameworks.

The data cited to support these approaches is largely drawn from previous literature so that observations and categories are generally covered elsewhere in this paper leaving. We draw conclusions from the comparative level of explanation, simplicity, and theoretical unification of the problem space.

### 6.1. Head-Driven Phrase Structure Grammar

The work of (Pollard & Sag, 1992) seems first to be useful because it unifies some subcases while arguing for a “relational” analysis:

“Principle A should be formulated in terms of relational rather than configurational superiority”. (Pollard & Sag, 1992, p. 42)

But this characterization is not sufficiently substantive because, even while eschewing C-command, it takes us deeper into configuration, rather than away to function; the analysis is in terms of obliqueness:

“relative obliqueness, rather than C-command” (Pollard & Sag, 1992, p. 42)

This remains formalist because it is dependent on the decoration of syntactic trees with “SUBCAT” lists. These usefully unify exempt/nonexempt cases under a revised Principle A, but they add apparatus even beyond C-command, in a concept of obliqueness command (o-command). Here is the definition of SUBCAT: (Pollard & Sag, 1992, p. 21)

“verbs and other lexical items that head phrases bear a lexical specification for a feature SUBCAT, which takes as its value a list of specifications corresponding to the various complements (broadly construed to include subject, including possessive phrases within NPs) that the word in question combines with in order to form a grammatically complete (or saturated phrasal) projection.”

These lists do not reflect surface order but the order of “relative obliqueness”. Complements are more oblique than NP objects and objects are more oblique than subjects. This is intended

to replace X Bar theory and is a central reformulation of configurational. It descends more deeply into configuration, providing a description of patterns, but lacking functional explanation.

Here is the revision to Principle A which adds the complexity of o-command:

A locally o-commanded anaphor must be locally o-bound. (Pollard & Sag, 1992, p. 42)

This depends on the following:

Definitions of O-Command and O-Binding (Pollard & Sag, 1992, p. 42)

A o-commands B just in case A locally o-commands some C dominating B

A i-binds B just in case A and B are coindexed and A o-commands B. If B is not o-bound, then it is said to be o-free.

Configurational complexity is ascendant here, evading any reason why reflexives are used. The reason for locality and the descriptive viability of tree-configurational command constraints is that the level of predication is correlated with the probability on which default assumptions are based. The default assumption of no co-reference loses significance as syntactic distance is increased expanding the range of nominals. Probability of co-reference quickly diminishes. For exempt data, locality beyond commanded positions becomes a variable constraint, even sometimes licensing the non-reflexive form where Principle A or its derivatives would prohibit it. This fungibility deprecates the explanatory value of command.

Outside of command positions, reflexives are relaxed and generalized to broader utility by marking not just divergence from default assumption of no co-reference. This semantic widening extends to divergence from a wider range of default assumptions, of diverse kinds beyond co-reference. Reflexive as a larger phenomenon is a unified process attuned to default assumptions more generally. It ranges from expectations of local co-reference (Principle A) to default assumptions defined by diverse other situations over longer spans of structure. Reflexive is situational and expectational, not configurational.

Increased configurational complexity, while it may be descriptive of data patterns, cannot reflect the functional process by which a user decides to actually use a reflexive form. Configurational constraints reflect a formalist paradigm of compared patterns rather than particular instigations for a particular utterances.

The difference of PG is evident from its need only to specify that all cases of reflexive result from diversion from some default assumption of the more probable situation. This is the *raison d'être* of the construction. The more probable situation lacks special marking, which is only provided to signal that the less probable state of affairs holds. It is a signal to the interpreting receiver that a shared expectation of higher probability does not hold. For PG, this is the purpose, the generalization, and the scientific conclusion.

HPSG has the benefit of providing a unified treatment of non-exempt and exempt data under a



reformulated Principle A, but the reformulation adds a surfeit of complexity and remains configurational, without explanatory function, introducing intricacies of configuration in the form of SUBCAT lists. Albeit that SUBCAT may be independently motivated, with some ability to improve the generality of configurational descriptions, it lacks the explanatory dimension, to account for WHY reflexive constructs are used and what speakers are trying to DO when they use them.

## 6.2. Gricean Pragmatics

Levinson (Levinson, 1991) builds from the Gricean tradition to posit multiple divided interacting principles to account for reflexives. These multiply the controlling factors veering away from any central explanation. He unifies the phenomenon by relinquishing any bifurcated account that separates out syntactic phenomena of Principle A from exempt ones by means of a multifactorial pragmatic approach. This unification as a pragmatic process involves a complex set of descriptive features, whose interactions can be conceived of as a decision tree. The analysis is configurational, in an altered sense, where it is not configurations of syntactic structure that operate, but a set of declarative pragmatics requirements. Configurations of pragmatic/information properties are taken to underly reflexive patternings to the exclusion of syntax without aspiring to any simple functional explanation why reflexive forms exist or are used.

Here are the separate but interacting pragmatic factors: (Levinson, 1991, pp. 110–111)

1. Informativeness – “maximally informative and cohesive interpretation from minimal linguistic specification”
2. Manner Requirements – “[for] a marked expression an interpretation that is complementary to the one that would have been induced by the informativeness principle from the use of a semantically general expression”
3. Quantity of Informativeness – “contrastive interpretation between paired expression of differential semantic strength informativeness”
4. Hierarchical Priority – “when inconsistent implicatures arise, priority is given according to the following hierarchy: Quantity > Manner > Informativeness

The degree of complexity is evident in this layout of principles. .

For instigative use, and its requirement for processing speed, it is counter-intuitive that such a complex network, with complex derivations, would explain the live generation of reflexive forms. In PG reflexives are inserted by speakers simply to signal some situation that diverges from shared assumptions of what would be most probable. Any configurational account misses this dimension of intention that provides a functional explanation for the purpose of the grammatical construction.

We note that informativeness, manner, and quantity approach the spirit of the PG analysis, without incorporating essential elements. Usage patterns reflect also shared expectations regarding the most likely situation. Here are the theoretical contrasts:

1. Reflexives address informativeness, but their signaling is oriented to default probability

expectation, which is different and more focused than any less specific notion of semantic generality.

2. Reflexives involve formal marking as a manner of expression for that which is complementary to the alternative (with its affinity to contrast), but relegating this to semantic interpretation precludes the operational concept of divergence from default. This is the key to understanding the widening in non-exempt data.
3. Reflexives do involve quantity of informativeness, but this insufficient concept fails to capture the essential purpose of efficiency: marking is minimized when triggered only by less likely circumstances. It is not the absolute quantity of information that operates, but the comparative simplification of the signal when marking requirements are reduced.
4. Finally, hierarchical priority is unnecessary in a PG account oriented to default signaling.

The general conclusion is that analysis must advert to efficiency and include key concepts:

- Default assumption of probability, orientation to probabilistic perspective
- Orientation to signaling divergence of default rather than semantic configuration
- Efficiency
- Use of shared expectation of probability rather than complex hierarchical semantics

Without these, intimations of purpose are left vague; the process of reflexive does not cohere as a functional unit explaining its existence.

### 6.3. Summary

HPSG and Gricean Pragmatics account for reflexive patterning by positing configurations for the state of an utterance, whether syntactic or semantic/pragmatic. Required addition of detail for varied patternings adds complexity orthogonal to simple regularity or functional explanation. The use of hierarchies or decision trees as comparisons in structural paradigms adds complexity beyond what is required for psychological instigation of particular sentences. These approaches follow from the rather more descriptive viewpoint of a purely syntactic formalist style of generative grammar. They do not advance to comprehend the context of active generation of sentences by a speaker.

The PG approach supersedes solutions proposed for HPSG and Gricean Pragmatics because it unifies treatment of both exempt and non-exempt reflexives by handling all cases with a simple principle of probabilistic efficiency. This precludes complex configurational constraints that fail to explain the existence of reflexives and rely on differential description of sentence sets rather than a particular sentence instigation.

We attribute inherent limitations in configurational accounts to the lack of functional elements incorporated in Purposeful Grammar:

- Lack of probabilistic perspective
- Lack of efficiency perspective
- Lack of default

- Lack of simple/unified solutions over complex configuration in syntax or semantics
- Lack of functional perspective to explain purpose of construction
- Lack of orientation to instigative use for signaling divergence from default
- Lack of main syntactic purpose for signaler to manage uncertainty in the signal

## 7. Conclusions

For a comprehensive range of published data, the reflexive is observed to signal an override of a statistically likely, more expected, default assumption (expectation) for the intended interpretation of the marked nominal.

Within a predication, reflexive marking signals rejection of a default assumption of no coreference. Beyond the predication, in ‘exempt’ reflexives, there is a generalized signal that some expectation regarding the marked nominal will not hold, but without specifying which particular one. It is left to situational inference in semantic interpretation to identify which shared assumption, held between speaker and hearer, is involved. Situational variability explains the inability of configurational specifications to converge on a central generalization or explanation. These assumptions/expectations are an accessible community property held in mind as a shared social resource. Supporting empirical evidence that speaker communities hold coefficients of expected probability is available in (Smith, 1978).

Shifting the analysis to the level of shared default assumptions/expectations allows a general solution to the problem of reflexivity not available at a syntactic or pragmatic structural level. The *raison d’être* of reflexive is to efficiently manage uncertainty for interpretation in regards of the marked element.

Structure-configurational analyses of reflexives lack a full exploration of the essential functional perspective. They probe syntactic and semantic correlates, but do not explore why the linguistic mechanism exists or how it functions in a utilitarian context. PG pursues functional explanations by shifting analysis to the level of purposeful intent. This adjustment of architecture both explains the reasons for the syntactic manifestations and can obviate over-generation and requirements for output screening in generative grammars in those cases where ill-formed sentences would never be conceived in the first place.

This more capable level of functional analysis, with an added modular interface, provides that structural intentions can feed syntax building operations. It reflects an *a priori* disposition of theoretical syntax eventually to move beyond a purely configurational approach since communication is profoundly intentional. A functional model that is supported by facts of purpose beyond patternings of structural analysis.

We show why C-Command should have the outsized descriptive power that it has, due to the interlocking of purpose and structure. The sisterhood of C-Command is, from the intention perspective, a boundary on clause predication that imposes a limitation on functional complexity. C-Command holds where it does, in structure building tools such as the SBT non-exempt reflexive, to limit the search scope for interpretation. C-Command reflects scope limitations to avoid the potential for combinatorial expansion for search beyond clause predication.

Management of uncertainty enhances linguistic analysis of reflexives, and improves the conceptual underpinnings of generative syntax by integrating the essential role of function.

Formalist structural analysis takes syntactic theory quite far, but there is further to go. Science abhors finalization.

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