

# Language Disorders as a Window on Universal Grammar: An Abstract theory of Agreement for IP,DP and V-PP

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A new concept of Agreement has been represented as a Formal Feature that can appear in a wide range of different configurations (Chomsky (1998)). A case study from language disorders supports and extends this abstract concept. The child shows no agreement in IP “me can” and DP “them eyes”. We then extend the notion of AGR to include verb-PP relations, where the child also systematically avoids certain prepositions (“go beach”). The analysis is supported by intuitional data from compounds (sweep with broom => broom-swept). We also define a systematic notion of Possible deficit as a premature fixation of functional items which normally require additional Phi-features. The notion of Maximization of Formal Features then emerges as a significant feature of learnability from both a normal and disordered perspective.

Running Head: Abstract Agreement and Disorders

Keywords: Agreement, Disorders, Learnability, Functional Categories

## 1.0 Possible Disorders<sup>1</sup>

This essay will be an exercise in making a direct connection between Disorders and an abstract notion of Agreement. The argumentation brings forth new facts from both theory and disordered data, but it is the disordered data which puts the intuitional data into sharp relief. It is, nonetheless, primarily a theoretical story which in addition to the merits of its own logic, calls for more extensive empirical inquiry.

Our first goal is to provide a theoretical platform for the integration of language disorders into linguistic theory, that is, the concept of Universal Grammar. If we adopt reasoning that is parallel to linguistic theory, we can ask:

- 1) Can we define a concept: Possible language Disorder

In other words, we seek the same intellectual coherence as the notion of : Possible Grammar which is the set of grammars defined by Universal Grammar. Our premise is that disorders reflect systematic properties of UG.

The notion “performance” might suggest that no concept of Possible Disorder will ever be forthcoming. One might maintain: All instances of deviance are accidental, like a bump on a fender, whose location is determined by an outside force. However, like other biological systems, one can imagine a systematic form of deviance, like a missing organ, say eyes, whose consequences, blindness, are quite systematic. In fact, articulatory disorders are captured in very systematic terms. Therefore we might expect the same in syntax. Our argument is built around the modern concept of Formal Features, and the possible Categories they create. The general idea is that a single missing feature can affect a variety of constructions:

- 2) A. The Missing Formal Feature Hypothesis
  1. Disordered Children may not recognize certain abstract features
  2. Therefore they are led to:  
Prematurely fix the content of lexical items
  3. Lexical items then project Categories with missing Features

Any learner may misconstrue meanings in what we can call real-world semantics, such as assuming that the word dog is any four-legged animal (and includes a cow). It is different for grammatical features: if a child were to say \*"me runs where they would not be sensitive to the Formal Feature of nominal case carried by the inflection run. Gopnik (1990) has proposed that disordered children are broadly insensitive to features of Functional Categories. We suggest that more fine-grained deficits may exist.

### 1.1 Maximizing Formal Features and Learnability

We advance two broad assumptions about learnability in general in our theory-building quest:

- 3) 1. Maximize Formal Features
  2. Do not enter a Lexical Item into a grammar

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<sup>1</sup> Thanks to the audience in the Utrecht Workshop on language disorders, and for written comments to Angeliek van Hout and Alan Munn, and to Marcin Morzyki. and Jill deVilliers.

until relevant Formal Features have been fixed.

The term relevant is, of course, critical but not yet specified. The notion that one should Maximize Features to insure learnability was introduced by Williams (1981) as an idealization which can be illustrated with an example. Suppose a child heard either of the following sentences, not knowing if she was an English or a German speaker:

- 4) a. I saw the boy
- b. ich sah den Mann

How should the child treat the articles the/den. Suppose the child made the maximum assumption in both cases:

- 5) the/den = singular, accusative, masculine, definite

The German child would make the correct assumption from the outset and make no errors. The English child, within a few minutes might hear (6) and drop the [+accusative] feature:

- 6). the boy is here => drop accusative

then a few minutes later she hears:

- 7) the girl is here => drop [+masculine]

then a few minutes later she hears:

- 8) the girls are here => drop [+singular]

The child has, invisibly, arrived at the correct English grammar very rapidly although the starting point was a wildly enriched first hypothesis about the content of the article the.

In this system, both children would get the right grammar quickly and neither would make errors. It would entail that a child might travel through ten grammars in a day silently. If one did the opposite, just fixed say definiteness, then we expect a child to erroneously use accusative for nominative since only definiteness has been fixed:

- 9) \*den Mann ist hier (the-accusative man is here).

Hearing other examples (der Mann) would not immediately correct the error. ( The example is an idealization because German children do make some errors, particularly with case, but for many forms they successfully avoid premature fixation of a lexical item.)

In fact, it seems that normal children are predisposed by UG to examine the auxiliary system for a range of relevant Formal Features: Case, Number, Gender. They seem to avoid use of auxiliaries until those features are examined. While a normal child may say "me want", it is rare for a normal child, but not necessarily a disordered child to say:

- 10) "me can eat"

Why is this error unlikely? In some languages, the modals are marked for Tense, Person, Number, and Case properties. In English it is marked only for Tense (could) and nominative (I, not me), but the child may not know this.

In particular, many examples do not reveal nominative:

11) John can sing

Therefore the child who hears this sentence, to follow the principles above, might recognize the meaning of can but would avoid insertion into the productive lexicon until further examples were heard which would reveal whether Case, Tense, and Number are somehow reflected. After constructing a paradigm for can and could the child would be in a position to make such a decision. The evidence suggests that children are conservative in this manner, although we are unaware of a close study. Is it the case, for instance, that a child would use can only for females for three days (because she first understood it clearly with a sentence like she can sing)? Hypotheses of this kind, of very short duration, are perfectly plausible within UG and would follow from the Maximization process just outlined.

The set of Formal Features (FF) is theoretically undetermined, but may include pragmatic, semantic, and other features (Chomsky (pc)). They are still Formal Features because their usage may deviate from their original definition. For instance, grammatical gender is not equivalent to real world gender. FF are those semantic features that are, at least, relevant at interfaces and have a formal function, but not all lexical features. This essay provides a small insight into what the set should be, but much is left to future research.

Chomsky has suggested that most features are linked to semantically [+interpretable] properties, but some are [-interpretable] and function only in the organization of grammar.

## 1.2 Disordered Hypotheses

Those FF which are linked to nodes should all be interpretable ("categories lacking interpretability should be disallowed") and therefore suggests that a Tense node, which has an interpretable dimension, is possible, but an Agreement node, which has none, is not, so [+AGR] is a feature within the Tense node.

Suppose we now make the hypothesis:

- 12) Disordered children fix lexical items prematurely:  
a) Disordered children fix lexical items without [-interpretable] features.<sup>2</sup>  
b) Specific Prediction: disordered child will fail to fix Agreement in several different configurations

In particular we will argue that a common Feature of [+AGR] is in:

- 13) Subject and verb (John runs/\*John run)  
Determiner and Noun (two boys/\*two boy)  
Verb and Preposition (sweep with a broom => broom-swept)

While the first two forms of agreement are familiar, the last connection is prompted both by behavior in language-breakdown, the behavior of compound nouns, and discourse effects. The extension to Relational Prepositions originated in observations about

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<sup>2</sup>See deVilliers and Johnson (pc) have evidence along these lines for third person as well.

disorders, but finds support in intuitional data as well. We return to a more systematic discussion, but we digress now to provide a formal background.

Note that we are assuming what may be a special role for production. It may be that a child will entertain many grammars for things that are comprehended, but reserve production for fixed features of the grammar. In an idealized form, this would allow for a theory of grammar-fixing that involves No Retreat (see Penner and Weissenborn (1996)).

## 2.0 Theoretical Questions

How abstract is phrase-structure? Traditionally the structure of the tree has been dominated (literally and figuratively) by a small set of category types and their complement or subcategorization structure: NP, VP, PP

This vision has engendered a variety of subtheories, arguing for a restrictive set of possible phrase-marker systems, or a Universal Base Hypothesis.

Recent work by Chomsky (1995, 1998, 1999), which parallels a tradition in Categorical Grammar (see Drozd (1993)), makes trees more abstract:

14) Nodes are various and consist of Feature-bundles.

Instead of an Inflection Phrase, or a subdivision into a TensePhrase and an AgreementPhrase, he argues that nodes are semantically meaningful, and may contain a variety of categorial and non-categorial (semantic or functional) Formal Features:

15) X = [+ or - Tense, + or - AGR, + or - Aspect features]

In effect, in his representation, one can argue that a lexical item itself projects to a higher node:

16)            thePhrase  
              /  \  
          the  book

Chomsky (1998) summarizes his view of the primitives of phrase-structure as follows:

'what operations enter into this component of CHL? [Computation Human Language] One is indispensable in some form or other: the operation Merge, which takes two syntactic objects (alpha, beta) and forms K (alpha, beta).

A second operation is Agree which establishes a relation (agreement, case-checking) between an LI alpha and a feature F in some restricted research space.

A third operation is Move, combining Merge and Agree."

Chomsky then proposes that many forms of invisible connection be reduced to a form of Long-Distance Agree.

## 2.1 Theoretical Hypotheses

Can we find evidence for or against either general view? We argue that acquisition data, though it may be only momentary in the course of acquisition, can reveal whether children acquire fixed Tree structure, or Formal Features.

Two properties of acquisition evidence are directly relevant:

17) Are Formal Features missing?

If they are missing as defineable units, then it is evidence in behalf of the notion that they exist as units or primitives in the representations that a child has.

- 18) Is the same Formal Feature absent under different nodes?  
 19) Is the same Formal Feature involved in different configurations?

We shall argue that Agreement appears both in the Spec-Head configuration, and following Munn (1995,1999), in the Head-complement Configuration.

These claims lead to further questions that refer to the acquisition process itself:

- 20) a) Is a Formal Feature simultaneously absent in different structures?  
 b) Is a FF absent for a given individual in different structures?

## 2.2. Acquisition Theories of Agreement

The concept of Agreement figures in many theories. A representative cross-section of views would be captured by Clahsen et al's suggestions that case-agreement between verbs and nouns is a crucial domain of language-triggering. Clahsen et al, (1996) have argued that Agreement is missing in different structures. We argue specifically that this kind of evidence favors the view that FF are participants in Feature bundles rather than defining nodes.

Rohrbacher and Roeper (to appear) building on theoretical work of Speas (1994) argue that AGR (=IP AGR) is possibly missing in Asian languages. Therefore it is a universal option which is consistent with economy and may occur as a Default option (See Lebeaux (1990), Vainikka, (1990), Schutze (1997), Abdul-karim (1996) for discussion of defaults as an important ingredient) before agreement forms are triggered. They explain the simultaneous absence of subject and inflection in forms like where go with virtually no instances of \*"(where goes) as examples of this phenomenon.<sup>3</sup>

Schutze and Wexler (1997) introduce the possibility that there is an either-or choice between AGR and Tense to explain the absence of these forms in verbal contexts. Rice and Wexler (1997) and others have argued that the verbal kind of agreement can appear without comparable forms of non-agreement in the DP.

## 2.3 Agreement Theory

We argue that a common Feature of [+AGR], is found in different configurations (subj-verb/determiner noun/verb-prep). Agreement was initially proposed as a Specifier-Head relation that captured Phi-features (Person, number, gender) in a general Inflection Phrase. Subtle work advanced Pollock (1989), reveal that Tense and Agreement though often fused, behaved independently. Thus AGR was posited as an independent node. Recent treatments have suggested 1) that Agreement exists between Head and complement (Chomsky (1998) Munn (1993)) and 2) that Agree operates not only on traditional phi-features, but also on any invisible chain where matching occurs, thus "long-distance" Agreement is a possibility (Chomsky (1998)). In this realm, numerous Formal Features can be subjected to a kind of Agreement.

Which level of abstraction is right? Can we find evidence in behalf of one or the other view. We shall argue that our evidence indicates that:

- 21) a) AGR is not a node but a Formal Feature or relation  
 b) it applies in Head-Complement and Spec-Head environments  
 c) it captures relations beyond person, number, gender

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<sup>3</sup> See also Yang (1999) who makes the important observation that these early wh- forms involve only adjuncts.

We will not provide a full formal treatment, but rather develop Chomsky's approach in two respects. First we extend the notion of Agreement in a minor way to affect PP's. Second we identify the Formal Feature as parasitic on another Feature that has semantic value. (Chomsky articulates the concept in terms of a Probe Feature and a Goal which erases the Probe Feature.)

In other words, to anticipate the discussion below, Chomsky (1998) formulates Agreement matching [number +AGR] where "matching" stipulates an "identity of choice of feature, not value". We will isolate the notion of [+AGR] as a Formal Feature which operates to guarantee identity of other semantic features. This is equivalent to the notion that Agreement becomes "active". We characterize it as a Feature because we will argue that it can be a single form of disorder that extends across several configurations. We note that all these instances of agreement are local, and therefore long-distance agreement should remain definably different because the pattern of disorders distinguishes them.

Consider these examples. A nominal [+sing] triggers [+AGR=>] (=> means direction of choice of value)

22) Noun	Verb
[+sing]	[+number]
[+AGR].....[=>+AGR]	
	=>+s

Thus if a noun is marked [+sing], then [+AGR=>] is a Goal that links [+sing] to the Probe and marks a verb as [+sing]. The reason we reformulate this notion slightly is to argue that a single feature is operative in different domains and not linked to particular semantics.<sup>4</sup>

Chomsky argues that Agree is one of the fundamental relations:

(1999:4) "within these systems [TP,CP,VP] Probe and Goal match if features are valued for the Goal and unvalued for the Probe. If correct, the analysis should generalize to other core syntactic processes."

Disordered data provides evidence that other syntactic processes are included.

#### 2.4 Technical background:

Chomsky (1998) outlines the following system to capture Agree:

- 23) 1. "Probe and Goal. must both be active for Agree to apply."
2. "Matching of Probe Goal features apply, eliminating uninterpretable features that activate them"
3. "feature identity" is "identity of choice of feature, not value" (1998:41)

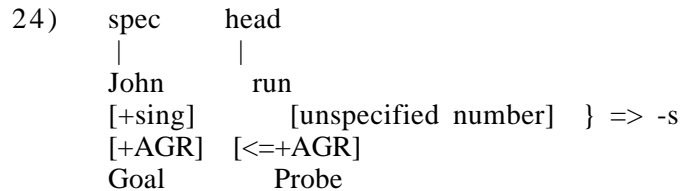
Chomsky suggests that one should :

4. "Maximize Matching Effects"

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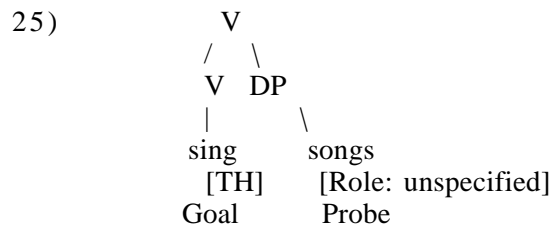
<sup>4</sup> See Munn (1995). He also makes a more restrictive stipulation about Feature-visibility in terms of movement, namely, that features become visible only when moved (pc). It is an interesting domain to clarify, but we are asserting a slightly weaker position simply for expository purposes.

but not all elements that seem like they could match do in fact match, as Munn (pc) points out, and therefore long-distance Agree must be constrained.<sup>5</sup> Therefore we summarize the notion that a wide variety of [uninterpretable] features induce AGREE to the notion that there is a specific Formal Feature Agree. This formulation a more specific hypothesis which fits the evidence and argument we provide below.<sup>6</sup> Applying the system within TP, the choice is number and the value is singular or plural. We formulate this via an independent [+AGR] feature:



In effect, the [+AGR] feature imposes singular on the verb's number feature, which then selects -s as the expression of that feature, and deletes the uninterpretable [+AGR] feature. Other relations are also agreement relations, including verb and object:

"The selector F for Merge is analogous to the probe for Agree. ...Take say transitivity of a verb V, If the property is implemented in terms of theta-grids, then a feature of V selects the object.....there is substantial evidence that G must be in the complement of the Probe P, not its specifiers." (1998:51)




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<sup>5</sup>Munn points out that:

- (i) There is a man and a woman in the room
- (ii) \*A man and a woman is in the room

Under Chomsky's system, (ii) should be good or (i) should be bad, but the pattern seems different.

<sup>6</sup>Chomsky (1999) suggests that one can assimilate wh-movement to Agreement phenomena as well. He suggests that one could have a kind of Agree/Pied-Pipe/Mark bundle of operations that carry out wh-movement. The evidence in this paper suggests that some form of wh-movement is available early on before the IP, NP, PP agreement phenomena. However, it may also be the case that children seek a similar agreement for wh-movement. Chomsky (1998) briefly suggests that "partial movement" phenomena are relevant and Yoshida (1999) explicitly argues that the form found among children, as well as German, Hindi, and Romani is agreement:

"what did she say what she wanted"

This is a separate topic and indicates that the fine-structure of agreement remains to be articulated. See Abdul-karim, Roeper, and deVilliers (1999) for recent discussion.



Thus we find that there is Agreement between Head and Complement, generally marked on the Head of the complement (e.g. accusative), creating Head-Head agreement. This claim is crucial to the view that the AGR relation is not limited to a single configuration.

## 2.5 Munn's Extension to DP structure

In a careful study, Munn (1995, 1999) discusses Agreement within the nominal domain. Every possible phi-feature is not in agreement with every other one. Thus we have:

- 26) a. a man's hat  
 b. a man's hats

A singular man has a plural set of hats in (b).

However where demonstratives are involved, we find that AGREEMENT is required:

- 27)a. \*this hats  
 b. these hats

This can be captured by Agreement between the Head D and its complement NP.

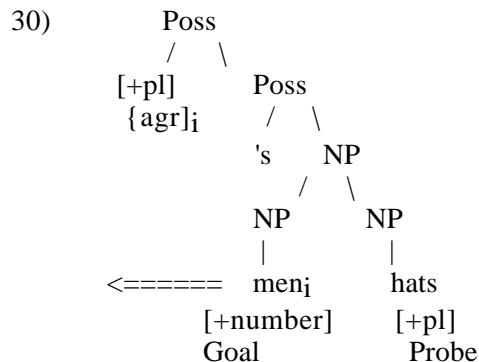
Within the NP, there is a further kind of obligatory Agreement which Munn discovered:

- 28) a. \*I like man's clothing  
 b. I like men's clothing.

The Agreement appears to be within a Possessive phrase inside the NP, forcing agreement with the NP-head, plural in this case, unlike the DP possessive, which does not require agreement (a man's hats). The NP-PossP exists together with a Possessive phrase in the DP, allowing phrases like:

- 29) Pierre Cardin's men's clothing

Munn (1993) represents this form of selection as follows (we simplify slightly):



After Agreement, the noun raises up to the possessive phrase. Note that while the noun men Agrees with hats a further Agreement within the Possessive is necessary in some instances. The choice of possessive is different for plural than singular in the pronoun system:

- 31) they [+poss] => their  
 he [+poss] => his

Therefore the Possessive node itself is part of the Agreement system and in fact Munn labels it a second kind of AGRP.<sup>7</sup> We argue that the Possessive marker inside NP's is a part of the Agreement system, a claim which is important in our discussion below.

This intricacy is not the focus of our analysis, but it is important to recognize how complex DP's are and how much language particular variation is present (See Perez and Roeper (forthcoming) for discussion). We will extend this formal treatment to prepositions below.

### 3.0 Disordered Predictions

Our system predicts that one might find problems anywhere Agreement is involved. It does not predict that they must all co-occur or that they are identical problems. In fact a number of papers have seized on the fact that there are many children who fail number agreement in the verbal system, but reveal it in the nominal system (Loeb and Leonard (1991)) and Wexler (1997)). Current evidence from Ramos (2000) suggests that in more complex environments (these bears' balloons), a number of problems within the DP exist, particularly at the comprehension level. Problems in the acquisition of complex DP's are precisely what one would predict from a UG perspective, because there is tremendous cross-linguistic variation, especially in the kinds of agreement allowed within the DP.

For instance, Munn reveals that in English there are two kinds of plural: quantifiers select for the feature [+Homogeneous] and put mass nouns and plurals together, most water and most men and the subject-verb plural treats mass nouns, without an over plural marker, as a singular (water is/\*water are). So mass nouns are assimilated to plural in one context and to singular in another.<sup>8</sup>

Three factors, at least, provide a reason to expect that the distribution of agreement errors in a disorderd population will vary:

- 32) a. configurational differences (spec-Head)  
 b. featural differences (+homogeneous)  
 c. frequency differences

We find that the amount of agreement required in DP's is much less and therefore the frequency of errors would be less.

These variations, however, do not undermine the power of the core claim that a large range of deviance can be accounted for by a single concept:

- 33) The Agreement Formal Feature is not represented

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<sup>7</sup>Agreement does not always apply to the Determiner. Consider the negative determiner which is in complementary distribution with articles:

- a. the hat  
 b.\*the no hat  
 c. these hats  
 d.\*nos hats  
 e. no hats  
 f. German: keine Hüter (=nos hats)

In German there is agreement with a negative element. This is another illustration of the subtle language variation to be found in the Determiner system.

<sup>8</sup>In fact, in African American English, the numerals do not always induce agreement: "50 cent" is common.

The lexical, phonological, and configurational factors that interact with Agreement, of course, mean that when it does appear, it will be in a piecemeal fashion. Like gravity, never pure, the core concept of missing agreement is important to articulate.

### 3.1 Case Study

In a study of a young boy JC (4.4-4.6yrs) Ramos and Roeper (1994) found clear evidence of concurrent Agreement problems in both subject-verb and determiner-noun environments:

34) That why them put a lot of sand in.

Note here that JC has a CP level element why and a kind of complex NP with a PP (a lot of sand). The presence of CP level material is already suggestive that it is not the upper part of the configuration, the tree-structure, which is missing, but the nominative assigning property of put.

Consider these cases of both missing Agreement in the IP and the DP:

35) Me Daddy like mustard  
Me sister name Dawn  
He family. He lost he family  
He shoveled him truck  
Them Mom could let them play outside

36) Nominative (in IP):  
Me like ketchup  
Me don't know  
Me said me gotta hurry up  
Her can cook something  
Them have a party

In addition, in a single discourse we can see that both are missing:

37) Discourse: "Me sister name Dawne. Her give me Dad a lobster, a two lobster, Me Mom put in here, cook them, forgot to take them eyes out.....".

In expressions like me sister we find that agreement between the possessive feature and the pronoun is required to produce my and not \*me's or \*I's, which is captured in Munn's system.

38) Discourse continues:  
and then it give it to Mom He say put it down. And then her say ahh, and then her put on the floor, and we scare her.. Her say, ahh it's moving, and then them cook them up, and it scared Mom, so we gonna put him to trouble. And then he be trouble....you can't eat eyes. Only you can eat skin. And me did eat it. "

We find occasional nominatives here, but wide-ranging absence of agreement in both verbal and nominal contexts.

While in normal acquisition the emergence of agreement and other Formal Features happens so quickly, it is difficult to separate out which factors are independent. In JC's language, we find that there is ample evidence for other kinds of complex syntax, while precisely agreement phenomena remain unmastered. Modals are present:

39) Me can have this

her can cook something  
 me can't get home to go shopping  
 it don't have a mouth  
 then me no have to go bath  
 it can poke somebody  
 me don't have a cat on a bed  
 Only you can brush your teeth very good  
 No her can put up here  
 I see he shadow....I can make see my shadow

Negation over a Verbphrase is present:

- 40) Me never have them real big  
 Me never take a shower

There are also extensive examples of CP-level phenomena, like wh-movement:

- 41) When me go outside to play, me go like that  
 that because them Mom don't let them  
 that why them put a lot of sand  
 Why him don't have eyes  
 when him crack tiny pieces up, and then put (unintelligible)  
 why her need this  
 what's I talking about  
 I don't know where her can cook  
 I don't know what he saying  
 What's I talking about

Also there is evidence of Operator-movement:

- 42) lobster to eat for lunch  
 [lobster<sub>i</sub> [Op<sub>i</sub> to eat t<sub>i</sub>]]

In addition other signs of complex syntax co-exist with the absence of agreement. For instance, the presence of reflexivization:

- 43) her standing and her see herself  
 me hear myself again  
 he burn heself  
 he could burn heself

He can occur as a possessive as well:

- 44) he lost he family  
 he have he hats on<sup>9</sup>

Therefore it is not clear that he should be treated as a nominative in any context.<sup>10</sup>

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<sup>9</sup>The presence of these cases with "he" resembles others in early stages of normal acquisition (see Schutze and Wexler (1996)). It is not clear that all cases of nominative should be treated alike. For instance there are no reported cases of "I hat". In fact, the 1st and 2nd persons often behave differently from 3rd person (see Levy and Vainikka (1997)).

The crucial point is that there are clear absences of Agreement across different configurations, while other features for complex syntax are present. A broad picture of ten recordings can be found in these statistics

- 45) 10 weekly recordings:
  - a. 386 instances had "me" as possessive in 56% of cases,
  - b. "them" 100% of cases for possessive
  - c. "he" 60%, "him" 40%. for possessive
- 46) Subject Pronouns:
  - accusative (me, him, her, them): 73
  - nominative (I, he): 113

Although the child clearly has both he and him, it is not clear that he is linked to nominative even before verbs, since (a) it appears often as a possessive, though not as an object, and (b) the verbs showed no Agreement markers. One could call it a second default form, but not necessarily. It is possible that the child analyzes he as a word outside the pronoun and agreement system. For instance, if he = that person, then it would be an independent lexical item not subject to Agreement. The absence of she highlights the fact that the child's hypotheses about each one of the pronouns seems to be subject to the kind of individual variation we associate with learning separate words.

### 3.2 JC'S Comprehension

Use of "me" for "my" has sometimes been seen as a pronunciation problem: the child has the distinction clearly in mind, but simply mispronounces the word "my". Such children would never make an error in comprehension, since they do indeed know the difference.

Therefore we sought to see if JC would comprehend "me" as "my". We created an ambiguous environment with a set of corresponding pictures. Sentences pairs of the form:

- 47) a. the boy saw me paint/the boy saw my paint
- b. the boy saw me drink/the boy saw my drink
- c. the girl saw me ski/the girl saw my ski

And then we asked the children to choose which picture was intended. The results were:

- 48) a. presented with "me", he pointed to "my" 4/5times
- b. resented with "my" he pointed to "me" 1/5 times

In other words the child comprehended "me" as "my" but not the reverse. This fits work on normal acquisition where children allow "me" for possessive, and "my" for nominative but not "my" for accusative. That is, there are no recordings to our knowledge of children saying "help my" when they mean "help me". (See Vainikka (1994), and deVilliers and Roeper (1992)).

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<sup>10</sup> Were we to assume that children possess some kinds of Agreement, then we must still explain the set of cases where agreement is missing. We can approach this mixture along the lines of multiple grammars advocated by Roeper (to appear) and Yang (1999), which has been argued for in the history of English as well by Kroch and Taylor (1997). One can argue that earlier and later grammars can co-exist before one grammar dominates, if it dominates. Alternatively, one can argue that children return to a Default representation (see Vainikka (1990), Lebeaux (1990) , Roeper and deVilliers (1992) , Schutze (1997)).

While it is true that normal children typically move through a phase where a default accusative is used in English, and default nominative in other languages (like German or Arabic), it is virtually unknown to find extensive use of these defaults when the auxiliary system emerges. In a study by Abdul-karim (1996) on case and agreement, she found that children until the age of 2 and 1/2 often used the discourse default me when asked the question:

- 49) who has a hat => "me"  
=> after 2 1/2 "I do"  
=/=> never to \*"I" or to "me have"

A form like (50) deviates from the normal path of acquisition:

- 50)"me can't get home to go shopping"

It is precisely an example of premature fixation of a Lexical item, namely, auxiliaries. We argue that UG prevents the normal child from using an auxiliary like can until its case-assigning properties have been fixed. Their fixation would be confirmed by a match with heard utterances, all of which assign a nominative case, producing the phonologically distinct forms he, she, I. This child has clearly chosen to enter the word can into the productive vocabulary without this Formal Feature, therefore allowing a default case form for the noun (me can). This is possible because the word can has semantic features which are independently recognizable even when the Formal Feature of [+AGR] is not recognized.

### 3.3 -s and Premature Lexical Fixation

This system makes another prediction: the affix -s will not undergo premature fixation because it has no link to an interpretable semantic feature. Thus we will not find random cases of:

- 51) a. \*"trucks drives  
b. \*" them drives

A word must have some semantic feature in order to undergo fixation. One might at this point object that -s is linked to an interpretable Tense feature: present tense. However, English does not have a true Present Tense, since it carries a generic interpretation:

- 52) he plays baseball =/= he is playing baseball

Generic and progressive (-ing) involve Aspect which evidently creates an acquisition challenge we are just beginning to unravel.<sup>11</sup> Therefore, arguably, the -s has no clear [+interpretable] feature.

Possessive marker {'s), possessive agreement (my, their, his), and nominal agreement (two lobster) are all missing. We conclude that Agreement is missing in two different configurations and lexical items have been entered into the grammar without the necessary features.<sup>12</sup> If the productive grammar is formulated, ideally, under a system

<sup>11</sup>See van Hout (1996) and Wagner (1999) for pertinent discussion.

<sup>12</sup>There is some obscurity here both in theory and in the data. There are examples of dialect in which one hears "they says" and a form of emphasis is present, and perhaps other semantic features.

of No Retreat, then we can expect that remediation may not be easy, that is, adding Formal features to already.<sup>13</sup>

### 3.4 A New Method

Our discussion has revealed that Agreement is absent in more than the verbal domain, but also in nominals. In addition, we have revealed striking sophistication elsewhere in the grammar: movement, reflexivization are present. The results are predicted by modularity. Each module can proceed somewhat independently, with the result that a child exhibits a wild mix of sophisticated language behavior and errors. It is like a child with an obvious articulation disorder combined with elegant syntax.

If this approach is true, then we can seek a perspective which uses SLI itself as the source of insight. If a child has a defect in the module which introduces Agreement, then wherever the FF of [+Agr] is required, a difficulty could arise. We pursue therefore a notion of simplicity within diagnosis:

- 53) Diverse problems reflect a single deficit with a  
Formal Feature of Agreement

Now our method will be to identify problems and see if they are formally amenable to a treatment within the Agreement system. This leads to seeking confirmation within intuitional linguistics, reversing the direction of our empirical quest.

The crucial intuition is that there may be a simple description of disorders at an abstract level. There is nothing biologically necessary about this claim, but it would be in keeping with other medical disorders where a single problem can have diverse consequences.

### 4.0 Relational Prepositions

Clinicians often sense other kinds of deviation in disordered children not captured thus far. The terminology used is that children are often "incomplete" in their utterances. In fact, however, the incompleteness, as far as we can tell, does not violate UG. For instance, as we said, we do not find children who say \*"I want the."

Our curiosity was engaged when we noted that children with SLI appeared to answer questions with the right content, but with a somewhat incomplete grammar:

- 54) How did she decide to sweep the room

the answer we received was "broom". Adults and most normal children reply "with a broom". Why was the preposition deleted? Tabulating this observation, we found that among 17 disordered children (ages?) to whom we gave a battery of wh-questions that have been given to children in six different languages. We found 26 instances where the Preposition was deleted in these contexts.

Now we can ask: would a child who is deleting Agreement in nominal and verbal domains, also delete them in prepositional domains. A re-examination of our small corpus of 386 utterances from JC revealed a set of examples of this kind:

- 55) What beach you going (go to)  
Me go beach not far away (go to)

---

<sup>13</sup>Under the model of Theoretical Bilingualism (Roeper (1999)) or Yang (1999), we would predict that the child would retain the original productive grammar as a new, AGR-sensitive, grammar is developed. Perhaps social register would favor one or the other. This seems to be precisely the case.

then, he knocked him window (knock in)  
Then me no have to go bath (go to)  
some wake up middle of the night (wake up in)

We find that just a certain kind of Preposition is missing here: a relational preposition (to, of, in) which is in fact predictable from the verb (go-to). Other prepositions are present:

56) then dump into a truck again  
dirt is falling all over him

Brennan (1991) found the same characteristics of preposition deletion in data from normal children below the age of 3yrs:

57) we colored crayon (=with)  
Shirley get meat dinner (=for)  
I cut it a knife (=with)  
Richard bring snack Shirley (=for)  
feed baby fork (=with)  
Shirley cut fork (=with)  
I sleep big bed (=in)  
Save some later (=for)  
I went party (=to)

She characterized this as missing adjunct Prepositions, but in fact it is clearly limited to the relational kinds shown above. However the same children will use the same prepositions when they are arguments of the verb. Being an argument of the verb seems to mean that the verb directly assigns a theta-role to the object of the preposition, rather than selecting the preposition itself.

58) I played with Joan  
Jim was at Cooperstown  
putting Daddy in wagon

She found that 46 prepositions were present for arguments, but only 3 for adjuncts. She concluded for "3 of 4 children studied, it was true that adjuncts never surfaced with PP's,"

#### 4.1 Building Theory

Now we can ask two further questions: 1) Can we find a natural place within linguistic theory for relational preposition-deletion which, moreover, fits the other sorts of disorders we have found. And 2) is there intuitional data which is predicted from this account?

First let us assemble intuitional data. Roeper and Siegel (1978) observed that prepositions are deleteable in compound formation, but just those which are "abstract" or "relational" in character. Consider these cases of deleted to like those from the disordered child:

59) church-going/theatre-going/school-going

But where other prepositions are involved, no deletion is possible:

60) go through tunnel => \*tunnel-gone  
found around flowers => \*flower-found  
stand beside the barn => \*barn-stood



Note that the absence of with with the verb sweep can be found in compounds: broom-swept room.

In addition, in Discourse, we often find deletion that is not possible elsewhere:

- 61) Who has a hat? Me [\*me has a hat]
- 62) Prep deletion
- a. where do you live? “San Francisco” [\*I live San Francisco]
  - b. where are you going? “Detroit” [\*I am going Detroit]
  - c. when are you playing chess? “noon” [\*I am playing chess noon]
- 63) Non-deletable:
- a. when did it first seem odd to you? \*night [“at night”]
  - b. how are you playing? \*bat [“with a bat”]
  - c. How did you get to the other side of the river \*tunnel  
\*I went to the other side the tunnel  
through the tunnel
  - d. why was the game cancelled \*accident [“because of an accident”]
  - e. where does it hurt? \*stomach [“in my stomach”]  
\*in stomach
  - f. where did you put it? \*arm [“on my arm”]  
\*on arm

In general, the set of deletable cases are small, but regular in that they involve relational prepositions that are predictable from the verb.<sup>14</sup> Case-marking, when present (me) is accusative, and seems to reflect the availability of Default Case when no verbal environment is present.

Now let us ask why prepositions are deletable in these contexts? The answer, we argue, reflects the fact that prepositions have two functions: they assign case and they reflect Formal Features of the verb which selects them.

Under incorporation, no case-assignment is needed, because the DP is reduced to a Head N, which does not require case. Moreover, the semantics is also redundant because, as stated, the preposition is selected by the verb and in fact involves a determination of possible features. Thus the preposition to can carry several different meanings:

- 64) to: direction => go to the beach  
recipient => give to Bill  
experiencer => seem to me

The determination of meaning is a result of selection by the verb. In other words, the situation can be seen as identical to the Agreement relation between noun and verb, but in this case over a complement configuration.

A natural approach, enlightened by the acquisition data, is to propose that the Verb carries LOC selection, and the Preposition agrees with it. Just as the noun imposes [+sing] on the verb by Agreement, the verb can impose [+loc] on the preposition by Agreement.

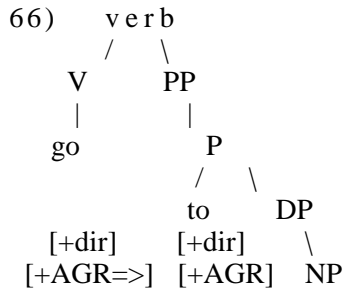
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<sup>14</sup>Klein (1993) has noted that Preposition-deletion is a characteristic of L2 speakers, and Bresnan (1989) has noted that many languages involve preposition deletion under topicalization. There are consequently more ramifications for cross-linguistic study which however go beyond our purposes here.

65) John runs => NP[+sing] => V[+sing] via Agree

Relational Prep = Agreement between  
 VERB      PREP  
 [+loc]    [+Loc]

Let us represent this notion of Selection as an Agreement relation between a verb and its selected P, where Features determined the value of the agreeing P:



Here we extend the system in a minor way to the selection of a PP object. Notice here that the verb carries the semantics on its own, and if there were no need for case-assignment, and no AGR feature, then there would be no need for the Preposition. We argue that Compound formation is below the syntactic level where AGR would be projected, therefore no AGR is projected for compounds.

This account, via Agreement, stands in contrast to the view proposed by Hale and Keyser (1993) that, though similar in spirit, seeks to explain the elimination of Prepositions via movement of an object through the Preposition position for certain constructions:

67) put a horse with a saddle => put a horse saddle => saddle a horse.

The Hale and Keyser approach, like others, would not predict a connection to Agreement problems in a disordered child. It is therefore via allowing the phenomenon of disordered language to be in a pivotal position, that we are able to choose among possible abstract representations.

#### 4.2 SLI/Normal Comparison

We undertook a comparison between 10 children matched in age but whose testing indicated normal language, and 10 who were designated as SLI by a variety of tests. The results showed precisely the same kinds of errors among the disordered children, but only one normal children exhibited accusative subjects (See Ramos (2000) for details).

68)

A. Case Normal Of the 10 normal language matches, only one (Kate, age 4;1) uses the accusative for nominative substitution, always "her" for "she" with agreement. She never used "she", which may suggest that her problem with this pronoun is at the lexical level. Here are her sentences: "her has her own"; "her was sleeping over"; and "her gets to be the big sister".

B. Case Disordered 5 SLI kids used accusative for nominative:

Justin (age 4-9): many instances with INFL, e.g. "him will mess the room up", "him was angry about it". He never used "she" or "they" and used "he" only twice: "He can say him a guy", and "he tripped on the tree"

Kyle (age 4-9): also many instances with INFL, including: "him know she's mad" and "what him doing?". Also never used "she" or "they", and used "he" four times: "he go away"; "he can't take net"; "he may jump in the water"; and "him knows he's mad".

Meghan (age 4-10): same thing, 6 instances of "he" always with INFL.

Vincent (age 5-1): same thing, 6 instances of "he", only 3 with INFL.

Amanda (age 5?): always "her" for "she", never with INFL, and 25 instances of "he", only 3 with INFL.

C. Genitive Disordered 7 SLI kids used nominative/accusative for genitive:

James (age 5-0): "on he head"; "in he boot"; "cause he want go back to he home"; "send him up in he room". 2 interesting exchanges: I said: "these toys are not mine", James: "who is them?" and I said: "whose boots are these?", James: "his" (only use of "his").

Clarissa (age 5-2): "he got the bucket on him head" (that's her only instance, she also used "his" correctly 4 times).

Amanda (age 5?): "he frog hop right there", (11 correct uses of "his")

Vincent (age 5-1): "on him head" (no instances of "his").

Carlton (age ): "frog a jump on him head" (no instances of "his").

Justin (age 4-9): "but where's him mommy?" (no instances of his").

Kyle: (age 4-9): "on him head"; "only him puppy", "him mad at him puppy"; "him will jump in him bath", "cause him wanna sleep in him bed" (no instances of "his").

D. Preposition Disordered 4 SLI kids deleted prepositions:

Justin (age 4-9): "but where all them now?"; "him looking the ball" (looking for).

Steven (age 5-2): "one them tripped". (one of)

Kyle (age 4-9): "looking him shoe" (look for)

Clarissa (age 5-2): "looking the frog in his boot" (look for)

We conclude that although JC's language sample shows a far more extensive pattern of consistent disorders, precisely the same problems with Agreement appear elsewhere among SLI children.

## 5.0 Conclusions

Our joint use of data from first language acquisition, disordered language, grammaticality intuitions, and the logic of theory construction provides a method for obtaining insights which any section of the data alone would be unable to predict.

In the normally developing child, nominative cannot arise without fixing the case-agreement system. We argue that the disordered child allows the Premature fixation of auxiliaries without Nominative case. While other modules develop independently, the Formal Feature Agreement seems to be absent in a number of environments in the disordered child, including DP and PP. The presence of wh-movement suggests that we do not find a parallel deficit in Long-Distance Agree.

The behavior of disordered children as a whole leads to a theory in which Formal Features can appear in different grammatical configurations and are themselves primitives in grammar. As primitives, they can cause disorders in apparently distinct

modules of grammar. The use of disordered data allows us to advance concepts in learnability such as the maximization of Formal Features in the projection of lexical items, which in turn is a first step toward defining a notion of Possible Disorder.

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