Phrase Structure and Gender Accounts in the Lexical Functional Grammar and the Minimalist Program

**KPAROU, HANOUKOUME CYRIL**  
**BABCOCK UNIVERSITY**  
kparouh@babcock.edu.ng, cyrilkparou@yahoo.fr

**Introduction**

Gender-marking in language is a relatively common phenomenon and it illustrates how a language community apprehends the notion of gender at the cultural level. Gender-marking in words can also be seen as a form of discrimination, whereas words of the same grammatical category are ranged into marked and unmarked. These important aspects of gender has caused a number of scholars to analyze how to account for the phrase structure and bring out the flexion of gender and other grammatical features in the lexicon. The Lexical Functional Grammar (LFG) and the Minimalist Program (MP) are two examples of theoretical frameworks which propose a phrase structure taking into account language features in the lexicon. Both theories are born and developed within the larger framework of the Generative Grammar. This paper aims at comparing the phrase structure analysis in general and gender in particular within the Lexical Functional Grammar and the Minimalist Program. It helps to apprehend common features and differences in their accounts for the Phrase Structure, especially in French, a gender-marked language where the manipulation of morphemes related to gender are differently approached throughout both theories. The outcome of this paper is also about which theory fits a better analysis of phrase structure in a gender-marked language, such as French, and consequently, provides a better methodology of teaching a gender-marked language.
The Generative Grammar (GG), a linguistic theory that has almost dominated linguistic analysis since 1950s, has diversified throughout many ramifications. Many of them today might be unrecognizable for a language theoretician of 1950s. Among the Generative Grammars are the Head-Driven Phrase Structure Grammar (HPSG), the Generalized Phrase Structure Grammar (GPSG), the Relational Grammar (RG), the Categorial Grammar (CG), the Tree-Adjoining Grammar (TAG), the Lexical-Functional Grammar (LFG) and the Minimalist Program (MP) (Lori Levin, 2004). The Minimalist Program, a direct product of the Transformational Generative Grammar (TGG), has been developed by many language scholars including Noam Chomsky, the founder of the GG. Another well-mentioned GG is the Lexical Functional Grammar which has relatively developed on the fringe of the Minimalist Program, as LFG is a non-transformational model. These two theoretical orientations are seen as opposed by many though dealing with same matter. Each of them has achieved many proven results. But whenever there are two ways, the question will focus on which way is the best or better. Unfortunately, no theory can be claimed best, as science itself is evolving, and such way unknown or rejected today could become the headlight tomorrow. Furthermore, theories are just hypotheses. Being able to evaluate one’s opinion or claim through many hypotheses results to knowledge. And of course, the choice of one hypothesis or another is a key to expected results, and that is where the question of formalism is important. In this paper, I aim at analyzing these two theoretical orientations, LFG and MP, basically on how they apprehend the Phrase Structure and especially the Gender marking in French.

1. Gender locations in lexicon

Gender, as stated by Crystal (2008:232), is a grammatical category “which has an important role in signaling grammatical relationships between words in a sentence”, based on word-classes. Many features can determine gender opposition in languages. For example, there are three genders in Germany and Russia, the feminine, the masculine and the neuter (Hartmann N. 2004:7; Polinsky M. and al. 1999: 698). Many Gur languages have other types of gender opposition based on features such as animateness, humaness, countableness, etc. (Brindle J. A. 2009). In French, gender is concerned with Masculine vs. Feminine distinction in lexicon. In that language, Gender agreement is marked on the determinant, the pronoun, the noun, the adjective, and the past participle. The examples below show gender inflection on three categories.

1) a. La petite étudiante est venue
   *The small student be+PRES come+PP*
   “The small student has come”

   b. Le petit étudiant est venu
   *The small student be+PRES come+PP*
   “The small student has come”
In these examples, gender agreement is manifested in the opposition of the words petite/petite “small”, étudiante/étudiant “student”, venue/venu “come PP”.

Therefore, at structural level, gender affect the DP (Determinant Phrase) and the VP (Verbal Phrase), the canonic components of a sentence.

In the following sections, the concern will be laid on presentation of the LFG and the MP and how these two theories apprehend gender marking through their respective view of the phrase structure.

2. Shared core values of LFG and MP

The Lexical Functional Grammar and the Minimalist Program have all grown out of Chomsky’s *Lectures on Government and Binding* (1981). Many LFG linguists do not reject Chomsky’s assertions on language in whole, especially, his earlier writings that laid the GG principles down. Upholders of both sides believe in the innateness of language, and the linguistic analysis as an explanatory exploration of the speaker’s knowledge of the language (Asudeh & Toivonen 2009). Many central questions stipulated by Chomsky (1981) are similar on both sides: What is knowledge of language? What does a speaker do when he speaks? How is language acquired? What is the relationship between language and knowledge (or brain)? What is common to natural languages? What diversifies natural languages?

However, to agree on a question does not mean the expected answer will be the same. Furthermore, same answers to one question may have different content; for instance, language is a set of rules that are transformational for the MP but functional for the LFG.

Another similar element for both MP and LFG is the symbolic representation. Both use trees and symbols such as DP, NP, VP, GEN; and both use linear rules such as IP →DP, VP; and both of them use boxes (introduced in linguistics by Charles Hockett, 1960).

Furthermore, LFG has preserved the general phrase structure of X-bare theory, one of the core values of the Principles and Parameters. The general phrase structure is the following:

* a. XP → YP + X’
* b. X’ → X + ZP

XP is the maximal projection of every phrase, X’ is the intermediate step of X which is the head. YP is the specifier of the head and ZP is the complement.

* 3) Le jeune garçon est content
  * The young boy is happy
In this structure (3), X is I (inflection), DP is the specifier and AdjP is the complement. The head I and the complement are sister nodes. It is the same for the specifier and the intermediate projection, whereas the maximal projection is the mother node.

However, these shared values and symbols are diversely apprehended and there are many other representations uncommon to each other. Many rules of MP are violated by some LFG representations and vice versa; for example, the Endocentricity Principle, central to MP, is not compulsory for LFG. Many symbols in LFG are unknown to MP. These differences are presented in the sections below.

3. The Lexical Functional Grammar
   3.1 Foundations

The LFG is born of the initiative of Joan Bresnan, a linguist, assisted by the psychologist Ron Kaplan. Their cumulated efforts resulted in a publication in 1982 entitled *Lexical-Functional Grammar: A Formal System for Grammatical Representation*. In that book and further writings, they posit that language is lexical-based, constraint-based and non-transformational (see also Dalrymple 2009, Bresnan 1995). The LFG rises in the midst and on the fringe of the Transformational Generative Grammar, which posits the first two principles, i.e., the importance of the lexicon and the grammatical constraints. The fundamental difference is the last assertion: a non-transformational theory of language.

According to LFG, no structure derives from another. Each structure is unique and non-representative. Sentences do not derive from one another, a declarative sentence is independent from its interrogative counterpart, and the same is true for the active and passive sentences. “A central idea of Lexical-Functional Grammar is that different kinds of linguistic information are modelled by distinct, simultaneously present grammatical modules, each having its own formal representation” (Asudeh & Toivonen 2009: 3).

3.2 C-structure and F-Structure Components

The LFG postulates for two major components for theoretical representation. The first representation shows lexical items and their inflexional information that is called Constraint Structure (C-Structure). The second one is called Functional Structure (F-Structure) and
represents all grammatical relations mapping those lexical items. These two components constitute levels of analysis within the LFG framework.

The C-Structure contains major information on a specific language, it is where lie most of information that differentiate one language from another, as all relation changes are lexical (Kaplan & Bresnan 1982; Asudeh & Toivonen 2009). The C-Structure is governed by the Lexical Integrity Principle, which states that words are morphologically complete. Thereof comes the assertion that “The syntax is [...] blind to the internal structure of words and sees only their category” (Asudeh & Toivonen 2009:5). A C-Structure sample can be presented as follow:

4) La tempête a détruit le bâtiment (French)
   “The storm has destroyed the building”

5) [IP [DP La tempête [I a [VP détruit le bâtiment]]]]

IP → DP, I
DP → D, NP
I → I, VP
VP → V, NP
D → la, le
NP → tempête, bâtiment
I → a
V → détruit

6)
Structure (6) is a C-Structure or a phrase structure tree, but functions (f) are F-Structure elements. LFG upholders did not agree on the position and status of NP and DP. According to Dalrymple (2009), the NP dominates DP, which is the specifier. That is not the case for Asudeh & Toivonen (2009), who posit the DP in a governing node with NP as a complement. Though minor importance is given to that difference in the LFG, I prefer the last one which is similar to the minimalist convention.

The C-Structure presents lexical elements in a tree and shows their relationship within a sentence. Functions (f) and metavariables (↑&↓) are used to show how lexical variables are mapped. The metavariable (↑) means “my mother node” and (↓) means “this node”. The equation (↑=↓) means “all my features are my mother’s”.

The F-Structure of the above example is presented in (7) below:

7)

The major difference in this representation with the Minimalist Program is the use of metavariables in C-Structure and the F-Structure component in whole. Compared to Principles and Parameters model, there is a certain equilibrium of levels of representation (with C-Structure only). The category I (or T or v (light v)) is admitted in the P&P and MP and can admit tense marking elements such as auxiliaries. In MP, the verb in simple tense is raised from V to I (or T or v) to check its tense features. That is not the case for the LFG which is non-transformational. The following instance shows the position of a non-auxiliaried V in C-Structure.

8) Le vent soufflait violemment sur le bâtiment

“The wind blew violently onto the buildings”

9) [IP [DP Le vent [I soufflait [VP violemment sur les bâtiments]]]]

IP → DP, I
DP → D, NP
I → I, VP

VP → AdvP, VP
VP → PP, V'
D → le, les
NP → vent, bâtiments
I → soufflait
V → ∅
Adv → violemment
Prep → sur

The above tree shows a headless VP, which has a PP on SPEC position and ends with a DP. Though this structure is propounded in LFG, it is a violation of a major principle in the

Minimalist Program: the headness principle is violated. This principle will be explained in a later section on the MP.

3.3 Gender analysis in LFG

From the above presentation on the LFG view of the phrase structure, one can draw a better apprehension on the gender within that theoretical framework. In LFG, there is no movement, neither for Lexical categories nor for features. Therefore, gender is one of the “grammatical information associated with a lexical item” and “encoded in the semantic form” (Neidle C. 2000). In this line, gender stands for a grammatical feature, not a category (Dalrymple M. 2001: 28).

According to LFG, as stated above, only constituents (lexical categories) are analyzed in C-Structure. Functional features are framed in F-Structure. The examples below show the analysis in F-Structure, where gender feature (GEN or GEND) is listed among other grammatical features.

11) a. La petite biche est tuée
   *The FEM small FEM doe is killed FEM*
   “The small doe is killed”

   b) SUB PRED ‘la biche’
      NUM: SG
      GEND: FEM
      PERS: 3rd
      ADJ PRED ‘petite’
      NUM: PL
      GEND: FEM
      PRED ‘tuer <SUB, OBJ>’
      TENSE: Passé Composé
      AUX PRED ‘être’
      TENSE PRESENT
      PARTICIPLE: PAST
      NUM: SG
      GEND: FEM

12) a. Le chasseur l’a tué
   *The hunter it FEM has killed*
   “The hunter (has) killed it FEM”

   b) SUB PRED ‘le chasseur’
      NUM: SG
      GEND: Masc
      PERS: 3rd
      PRED ‘tuer <SUB>’
      TENSE: Passé Composé

AUX  PRED ‘avoir’
TENSE : PRESENT
PARTICIPLE : PAST
   NUM: SG
   GEND: FEM
OBJ  PRED ‘la’
   NUM: SG
   GEND: FEM
   PERS: 3rd

In (11b), the feature GEND is presented at two levels: the subject (SUB), and the predicate (PRED). In this example, it appears twice in the subject (as a feature of both the noun and the adjective) and once in the predicate as a feature of the past participle. In (12b) however, the feature GEN appears at three levels: the subject, the predicate and the object.

The questionable situation of the LFG about gender analysis is the assumption that it is an intrinsic feature of all these categories: the determiner, the pronoun, the adjective, and the verb (participle). However, Asudeh A. and Toivonen I. (2009:2), in their attempt to explain this problem of features, assert that “F-structure is the level at which abstract syntactic relations are captured, such as agreement”. While we agree that gender is one of the features establishing “syntactic relations”, the location of the gender feature remains questionable. In the following section, the Minimalist Program proposes a different view of phrase structure and gender marking.

4. The Minimalist Program

The Minimalist Program is also a Generative Grammar, and indeed, one of the most influential Generative Grammars. It is the last version of the Transformational Generative Grammar inspired by Noam Chomsky (1995, 2000, 2001, 2004, 2008, 2009). It grew out of the Principles and Parameters model. The aim within the Minimalist Program is to simplify the theory of syntax and the approach to grammatical competence. The attempt to simplification leads to the reduction of the number of levels of representation.

4.1 Levels of Representation

The minimization starts with the reduction of the levels of representation. The P&P model (Chomsky 1981) was based on four levels of representation, namely: the Phonetic Form (PF) which represents the sound, the Logical Form (LF) where meaning is represented, the Deep Structure (D-Structure) being the abstract level of word order (structure-independent), and the Surface Structure (S-Structure) that is the perceived word order (structure-dependent).

However, the Minimalist Program states that, languages operate by selecting minimal parameters; that leads to the Minimality Principle. So, the four levels of representation in P&P are found excessive. Thus, the D-Structure and S-Structure are eliminated at the expense of the Spell-Out, which specifically replaces the S-Structure, the level of word order and perception. Definitely, we have three levels of representation in MP: the Logical Form, the Phonetic Form and the Spell Out.
4.2 Operations in the Minimalist Program

According to Chomsky (2001), one operation is fundamental: merging (cf. also Radford 2006). The merging operation governs all movements and representations. It can be divided into two major operations: External Merging (EM) and Internal Merging (IM).

4.2.1 External Merging

External Merging merges two different syntactic elements to one constituent. Two syntactic variables $\alpha$ and $\beta$ merge to form a higher constituent $\gamma$, as in (10).

This representation is illustrated in the following instances:

14) $[S \{DP \{NP \text{chasseurs} [VP \text{poursuivent} [DP \{NP \text{lièvre}] […]]]]\}$

S (IP) $\rightarrow$ DP, VP

VP $\rightarrow$ V, DP

DP $\rightarrow$ D, NP

NP $\rightarrow$ N

D $\rightarrow$ les, un

N $\rightarrow$ chasseurs, lièvre

V $\rightarrow$ poursuivent
Instances (14) and (15) illustrate EM operation. The Minimality Principle applied to EM underlies two other related principles: the Headness Principle and the Binarity Principle.

The Headness Principle (Radford 2006) or Endocentricity Principle (Carnie 2007, Galasso 2009) stipulates that every phrase or syntactic structure has a head. In (15) above, D and V are heads, respectively D les, un, and V poursuivent.

The Binarity Principle is introduced in the TGG by Kayne (1984) and has become a core principle within the MP. It stipulates that, every syntactic branching is minimally and maximally binary. Within the EM, syntactic objects just play the binarity whereby two independent variables merge to form one variable of higher rank.

These two principles (Headness and Binarity) are relatively absent from LFG. The Binarity is rejected in whole: “LFG rejects the contention that all phrase structure is binary branching” (Asudeh & Toivonen 2009: 10). According to LFG upholders, the requirement of binary branching is met in the F-structure. As for the Headness Principle, the LFG doesn’t make it exclusive. Both endocentric and exocentric structures are applied. “Not all phrases are endocentric” (Dalrymple 2009: 3). Though the S (sentence) category is pointed to support the exocentric branching, it is recurring to see LFG tree with other headless syntactic structures.

Example of (10) where we have the following rules:

16) a) VP → PP, V’
   b) V’ → DP (V→ Ø)

The rule 16b is a headless projection which is unacceptable in MP.

Another major operation within the MP is the Internal Merging.

4.2.2 Internal Merging
Internal Merging (IM) is the operation of moving syntactic objects to allow them to check
their features. Before 2005 (Chomsky 2005), IM was called Move Operation and the EM only
endorsed the Merging. In fact, it is evident that both play a same fundamental role, that of
associating a syntactic variable from one node to another. According to Wu (2011), the IM
operation is a copy-paste game. One element on higher node has its antecedent on a lower
node or vice versa. The instance (17) shows a copy-paste general tree.

17)

18) [CP [ti [TP [DP elle [VP lit [ti [DP le journal [souvent i]]]]]]]]
Elle lit le journal souvent (*she reads the newspaper often)

19) [CP [ti [TP [DP elle [VP lit [souvent i [DP le journal [ti]]]]]]]]
Elle lit souvent le journal (*she reads often the newspaper)

20) [CP [souvent i [TP [DP elle [VP lit [ti [DP le journal [ti]]]]]]]]
Souvent elle lit le journal (*often she reads the newspaper)

In the above instances, the adjunct *souvent has three optional positions. It can be a sister node
of VP under VP (15), it can be a sister node of V under VP (16), and it can be raised to higher
position in CP (17). We assume that position in CP is in situ whereas other positions are ex
situ. The raising from (15) to (16) and to (17) constitutes the IM operation. Traces of the
copy and their antecedent respect the c-command principle in (18).
4.3 Minimalist Program and Gender

Gender stands as a grammatical or functional category within the MP (Galasso J. 2009). However, the feature GEN can be minimalized in the head D (Determiner). The following are the presentations of Gender Phrase (GenP) under DP.

(22) and (23) present the External Merging of Gender Phrase (GenP), Adjective Phrase (AdjP), Number Phrase (NumP) under DP. (24) illustrates an Internal Merging of NP (Pro), which operates a copy-paste mechanism under the Head D.

22) DP, GenP and NP

a. 

b. 

La fille le garçon

The girl the boy

23) DP, GenP, AdjP and NP

\[
\begin{array}{c}
\text{DP} \\
\text{D} \\
\text{GenP} \\
\text{Gen} \\
\text{NP} \\
\text{AdjP} \\
\text{AdjP} \\
\text{NP} \\
\text{Les} \\
\text{belles} \\
\text{filles} \\
\text{The} \\
\text{beautiful} \\
\text{girls} \\
\end{array}
\]

24) DP, GenP and VP

a. Le chasseur a tué la biche
   The MASC hunter has killed the FEM doe
   “The hunter (has) killed the doe”

b. Le chasseur l’a tuée
   The MASC hunter It FEM has killed
   “The hunter (has) killed the doe”

5. Final implications of LFG and MP on gender

In the LFG framework, gender is analyzed as an intrinsic feature of all the words inflected by it. However, in the MP, gender is both a feature and a grammatical category dependent on the
Determiner Phrase (DP). There is a relative and limited complementarity between these two orientations in the consideration of gender as a feature.

But the principle of Lexical Integrity in the LFG does not allow us to have a better understanding of Gender in French language. Because no transformation is allowed in LFG and all the words are “morphologically complete”, should we consider the gender feature as intrinsically integrated to the noun, the adjective and even the verb? This would be very wrong, as far as features such as gender and number are related to objects (DP), not states and actions (AdjP, VP) (Crystal D. 2008).

6. Practical implications of LFG and MP claims on language acquisition – the case of passive clauses and complex words

The above account of LFG and MP allows us to grasp major similarities and differences between them. Yet, many questions could be raised on how human language functions, especially how we learn language and therefore, how it could be taught.

According to LFG, rules do not depend on one another, sentences do not derive from one another, rules are set independently in the brain and are applied independently. Affirmatives are not to be related to negatives, declaratives do not have any relation with interrogatives, passives do not come from active phrases.

The MP on the other hand posits that there is a transformational systematization in human language. That is why language is a set of limited elements used to form unlimited rules. It leads to the idea that, one should understand, though implicitly, an affirmative sentence in order to understand its negative counterpart. Interrogative sentences are better explained by a transformation from declaratives, and most of passives are derived from active phrases.

The case of passive is illustrated below in both approaches.

25) La grande foule était dispersée (par des policiers en colère)
   “The big crowd was scattered (by furious policemen)”

26)
The above presentations show the C-Structure (26) and F-Structure (27) according to LFG. As stated above, LFG is a non-transformational model, so the presentation shows no reference to the active counterpart of the sentence. Passives in LFG are also analyzed in A-Structure (Argument-Structure) where the active-passive relationship is explained by inverting thematic
roles such as agent/patient (Falk 2013). Though this is not called transformation in LFG, it is a real transformation where a patient or goal moves from object to subject position.

The practical implication of LFG is that, we don’t learn by transformation. That is not the case for the MP which posits a transformational structure in (28) below.

Within the MP framework, this passive sentence is a derivation of its active counterpart which is present in LF (Logical Form). The implication is that we form and learn passives by a relatively implicit transformation of the active counterpart.

28)

Many critics have been raised against LFG. The assertion that “syntax is […] blind to the internal structure of words and sees only their category” (Asudeh & Toivonen 2009:5) has been challenged by Ourso (2012) where he points the case of endoclitics and proper names to show how a whole sentence can be a word (or a word that is indeed a sentence). The same problem has been raised by Carnie (2011) with English example of “wanna” which specifically is a contraction of “want to”. The list could be extended to “gotta” for “have got to” or “have to”, and “gonna” for “going to” (see [http://www.onewoldofenglish.com](http://www.onewoldofenglish.com)).

In French the case is more interesting with complex determinants which are a combination of prepositions and masculine and plural definite articles (compare a, b, c, d in 23 and 24).

29) a. Je parle de la fille
   *I talk PRES of the girl*
   “I am talking about the girl”

b. Je parle du garçon
   *I talk PRES of(???) boy*
   “I am talking about the boy”

c. Je parle des filles
   *I talk PRES of(??? girls*
   “I am talking about the girls”

d. Je parle des garçons
   *I talk PRES of (???) girl*
   “I am talking about the boys”

30) a. Je parle à la fille
   *I talk PRES to the girl*
   “I am talking to the girl”
   b. Je parle au garçon
   *I talk PRES to the boy*
   “I am talking to the girl”
   c. Je parle aux filles
   *I talk PRES to the girls*
   “I am talking to the girls”
   d. Je parle aux garçons
   *I talk PRES to the boys*
   “I am talking to the boys”

These instances show the following combinations:

31) a. de + le → du
   b. de + les → des
   c. à + le → au
   d. à + les → aux

The major issue here is how to account for these combined elements. In MP, both P and D will appear in Logical Form (32) where DP c-commands P (DP is a complement of P).

32)
In LFG, however, the tendency would be to analyze these complex elements either as P or D. analyzing them either as P or D cannot account for their complexity.

7. Conclusion

Generative Grammars are a set of interesting heterogenic theoretical frameworks. The case of LFG and MP show many similarities and dissimilarities as well. Though both models have proven results at theoretical and practical levels, many challenges are raised and the question of language acquisition has been omnipresent. MP posits grammar as a transformational module based on three levels of analysis which are LF, PF and SO, whereas LFG proposes a non-transformational framework with two main levels of analysis which are C-Structure and F-Structure. Each approach has its own implications. The case of gender analysis, passives and complex determinants in French shows a gap at both theoretical and practical levels in LFG methodology. The Lexical Integrity Principle does not allow a clear representation of such elements in LFG. Furthermore, gender cannot be an intrinsic feature of the noun, the adjective and the verb. The Minimalist framework for gender and number, which posit [GEN] and [NUM] as elements of the functional head D (Determiner) allows us to have a better apprehension of the phrase structure and the mechanism of functional features.

Références


