Syntax-Semantics Interface
in Linguistic Theory

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Abstract

According to a process called selected focusing, the linguist in order to produce a coherent statement or an adequate description has to focus on one aspect of a language and exclude the others. Yet, such isolation is only an artificial element. A layman or a child does not have a least idea about the various levels of language. Yet, he is very-well equipped with the grammatical, structural, and semantic tools that help him to instantly identify the ill-formed or unmeaningful sentences of his native language as language is learned and taught as a whole.

With regard to syntax-semantics interface in linguistic literature, two opposite mainstreams have been found; a syntactically-oriented perspective (Chomsky 1957, 65, 79, 81, Cullicover 1976, Radford 1988, Horrock 1987, and Haegman 1992) modified and supported later on by the Optimality Theory approach (henceforth OT) established by Alan Prince and Paul Smolensky (1993) and a semantically-oriented one in its two facets the generative and the interpretive (Jerrold J. Katz & Jerry A. Fodor: 1963, George Lakoff 1963) developed in some of its aspects by Charles Fillmore's case grammar (1968). Furthermore, a great deal of effort has been proposed in line with these two opposite approaches to produce some experimental psycholinguistic and neurolinguistic studies to support or reject one or both of them (Millar & Mckean 1964, Savin & Perchonock 1965, and Clifton & Odom 1966, Gleason, J. & Ratner, N. 1993, Friederici, Angela D., & Jürgen Weissenborn 2007).

The early generative transformational approach went too far in insisting that the syntactic aspect has an autonomous characteristic and should be dealt with in isolation from semantics; others argue that they are interrelated and cannot be separated. Some linguists as the generative semanticists consider semantics as more basic in grammatical description than syntax; whereas, others hold a totally reversed approach assuming that semantics cannot be described and it should be considered as an extra-linguistic element.
This paper is at attempt to shed some light on this serious linguistic controversy to arrive at some general outlines that might help the linguistic theorists, language second/foreign teachers and students to establish a scientific scheme in dealing with language.

1. Introduction

Before sketching out various approaches related to the syntax-semantics interface in language description, it is advisable to keep the following remarks in mind:

The meaning of the sentence is the product of both lexical and grammatical meaning; i.e. “the meaning of the constituent lexemes and the meaning of the grammatical constructions that relate one lexeme syntagmatically to another” (Lyons: 1982)

1. The man saw the farmer.
2. The farmer saw the man.
3. The Man saw the teacher.

The difference between sentences 1 and 2 is ascribed to the fact that in the first sentence the lexical item “الشجاع” is a subject whereas it is an object in the second. On the other hand, the difference between 1 and 3 is due to the difference between the meaning of the lexical items “الشجاع” and “المعلم”.

The grammatical meaning is usually a descriptive one; that is, it can be accounted for in terms of truth condition as illustrated in 1 and 2 above. Yet, in some cases the users of language may connect the grammatical meaning with particular social or expressive dimensions (ibid: 157). For instance French, German, and Spanish speakers use a singular/plural pronoun distinction in addressing people such as “tu” and “vous”.

A similar demonstration is found in Arabic exemplified in the following:

4. You, your Excellency, is the hope of this nation.
5. We, the president of the republic, command the civil and military authorities to take a prompt action.

The distinction between what is commonly called grammatical and lexical meaning depends basically on the difference between the lexicon and grammar. In this respect Lyons (1996) states “the meaning of the sentence … is determined partly by the meaning of the words of which it is composed of and partly by its grammatical meaning”. Yet, such distinction is not always apparent; for instance,
there is no clear-cut difference between what it is defined by (Hartmann & Stock 1972 and Quirk, R. et. al 1985)
as content words such as nouns, verbs, adjectives which has an
essential role in transforming the semantic information, and the
function words such as articles, demonstratives, expletives which have
a more grammatical or functional role.

Moreover, the distinction between the grammatical and lexical
meaning might be discussed in terms of the sense and reference
relation. On the basis of the well-known distinction of sense and
reference relations of meaning established by the German philosopher
Gotllob Freg in his 1892 paper "On Sense and Reference", Leech
(1976: 11-27) presents seven types of meaning; the most important are
the conceptual which he defines as the "logical, cognitive, or
denotative content" and associative to which he assigns other five
types: Connotative, stylistic, affective, reflected, and collocative.

Most semanticists insist that the lexical meaning is more crucial
to our understanding of language than grammatical meaning. Quoting
from Zgusta (1971:61), Baker (1992:12) concentrates on lexical
meaning assuming that it is "the most outstanding individual of the
word that makes it different from any other words".

Lyons (1982: 159) deals with the difference between the lexical
and the grammatical meaning across languages assuming that what is
lexicalized in one language may be grammaticalized in another; for
instance, the recent actions with a particular effect on the present time
is expressed in English by using the present perfect tense, in Arabic,
on the contrary, the equivalent conception is expressed by using the
verification particle lexeme “قد” attached, sometimes, with an adverb
of time.

6. He has just arrived.

Following Chomsky (1957, 65, 79, and 81), several linguists
make a clear distinction between the two interrelated conceptions of
grammaticality and meaningfulness. The question of whether a
sentence or a string of words is a grammatical sentence is completely
detached from their true/false association (Cullicover: 1976). A
typical example in this reference is the well-known one composed by
Chomsky (1957):
7. Colorless green ideas sleep furiously.
This sentence is a syntactically well-formed one, but a semantically
ill-formed sentence. Whereas the sentence
*8. John wents home
is a semantically well-formed and a syntactically ill-formed sentence.

Another important distinction is between sentence meaning and
utterance meaning. In his reply to John Searle's article "Literal
Meaning" (1979), Katz, J. (1981) denies the existence of sentence meaning totally independent from contexts; a meaning which might be understood in terms of grammatical or structural considerations alone. Seale cites the following examples:

9. Cut the grass
10. Cut the cake

Searle assumes that the meaning of "cut" here cannot be interpreted without taking into our consideration the speaker's intention since one can not ran the cake with a lawn mower. Despite the fact that Katz agrees with the importance of the speaker's intention in explaining the meaning of these sentences, he assumes that it is not the speaker's intention that matters, rather it is the distinction between sentence meaning (the grammatical and structural meaning) which might stand alone to reflect the truth and the utterance meaning that depends on particular contexts.

Riley (1985), on the other hand, assumes that if we describe the utterance

11. I met the baker's wife.

grammatically, we would have many identical descriptions such as the first person pronoun "I" the past tense verb "met" etc., but if we describe it as an utterance, we would need a variety of descriptions corresponding to the various contexts in which it occurs.

12.
A. Did you get the bus?
B. I met the baker's wife.

Due to the shared knowledge, the utterance of 'B' could be understood by 'A' as the baker's wife has a car and gave a lift to 'B'.

2. Syntax-Semantics Interface in Linguistic Theory
2.1. The Pre-Transformational Outlook

Traditional grammarians did their best to provide a kind of semantic description to the grammatical elements and categories (Robins, R.: 1964). They were inclined to study comprehensively what they called the "logicization of grammar" or "speculative grammar" (Dineen: 1969). This grammar studies all aspects of language including the syntactic aspect in the framework of a universal comprehensive theory. The basic principles of the traditional speculative grammar were revitalized by the French teachers of Port Royal who assumed that the structure of the language is the outcome of reason (Lyons: 1979).

The objection of the treatment of meaning and the way the traditional grammarians related it to grammar is not because they concerned themselves with it which is a necessary process as it is proved later on, but because their treatment lacked a comprehensive and economical realization of grammatical description.
As for the structuralists, they emphasized, generally speaking, on grammatical theory and formal criteria for the establishment of grammatical elements in keeping the status of linguistics as one of the empirical sciences. They assume that the applied semantics had created various types of obstacles preventing linguists from arriving at a scientific grammatical analysis (Robins: 1964).

Bloomfield, who led the structural school of linguistics in the US in the 1930s and 1940s, did not deny the importance of associating meaning in the descriptive analysis, but consider it a secondary task of a linguist (Crystal: 1971). The immediate constituent analysis (IC analysis), which was primarily adopted by Bloomfield and his followers who were called the "Post-Bloomfieldians", was entirely concerned with the identifications and classification of particular constituents in the English sentence (ibid: 1971, P. 208).

The great linguists of that period such as Zellig Harris and Charles Fries, whose books were the most typical illustration of the structural approach, gave their entire attention to syntax at the expense of semantics. This point was one of the reasons behind the criticism directed against the post-Bloomfieldians made by the generative grammarians particularly by Naom Chomsky who assumed that meaning is far more important and central to language to be disregarded although Chomsky himself, as we will notice in the next sections, has not given the semantic aspect a satisfactory consideration (Chomsky 1957 and 65).

2.2. The Transformational-Generative Approach

In this section, we will introduce the syntax-semantics interface in terms of the three major versions of Chomsky's Transformational Generative approach discussed in Chomsky (1957, 65, 79, and 81) which he called the standard theory, the extended standard theory, and the revised extended standard theory consecutively. Though all these versions share many common principles, they have undergone several developments particularly in terms of the priority given to syntax over semantics and how these two levels are interrelated.

2.2.1 The Standard Theory

In his book "Syntactic Structures" (1957), Chomsky emphasizes on the notion of the independency of grammar. The two notions of "grammaticality" and "meaningfulness" are not associated in any sense. The following sentences are senseless. Yet, any English speaker can tell that only the first is grammatical (Allen & Buren: 1975)

1. Colorless green ideas sleep furiously.
2. Furiously sleep ideas green colorless.

Chomsky (1957:17) concludes that:

Despite the undeniable interest and importance of semantic studies of language, they appear to have no
direct relevance to the problem or characterizing the set of grammatical utterances. I think we are forced to conclude that grammar is autonomous and independent of meaning.

According to the standard theory (Chomsky: 1965), a grammar contains a syntactic, a semantic, and a phonological components as illustrated in Figure 1. below. The latter two are purely interpretative; i.e. they play no part in sentence generation. The base categorial component generates the deep structures which enter the semantic component receiving the required semantic interpretation.

In describing the function of the semantic component Chomsky says:

The projection rule of the semantic component operate on the deep structure generated by the base, assigning a semantic interpretation to each constituent on the basis of the readings assigned to its parts and the categories and grammatical relations represented in the deep structure (Chomsky: 1965:144)

Thus, in standard theory, the syntactic component is autonomous with a prior position in comparison to the semantic one.

Since investigating the correlation between syntax and semantics can not be illuminated with respect to the functions of the two components as it is obvious above, it might be useful to discuss such correlation in terms what Chomsky (1965) calls the "subcategorization" and the "selectional restriction" rules keeping in mind the both types of restrictions exist in the lexicon which is the major part of the syntactic component.

Subcategorization restrictions are those that govern the categories which a particular item required as its complementation (Radford, A.: 1988).

3. Dative (e.g., give) give [V+ NP NP] (2 object noun phrases required)
4. Intransitive (e.g., die) die [V -] (no object noun phrases) However, the complementation subcategorized by particular categories are subject to particular restrictions:
5. Jane tried to persuade her parents to go abroad alone.
   *6. Jane tried to persuade her dog to go abroad alone.

The verb "persuade" subcategorizes an NP complement; yet, there are particular types of NPs restricted by what Chomsky (1965) calls "selectional restrictions" which are based basically on semantic considerations. (Radford, 1988: 369) \(^{(2)}\).
After standard theory, it was proved by the contributions of several linguists that there were several cases in which transformational rules could not preserve the meaning in several grammatical occasions such as of "many + negation" and the use of anaphoric expressions. For instance, most English speakers would assert that sentences 7 and 9 have different meanings in comparison to 8 and 10 (Aitcheson: 1987).

7. Many cowboys do not ride horses.
8. Horses are not ridden by many cowboys.
9. Every candidate voted for every candidate.
10. Every candidate voted for himself.

On the basis of such criticism, Chomsky (1972b) proposes that instead of having all the rules of semantic interpretation operate on the deep structure, some should take the surface structure as input (see Fig.2).

Despite this great modification that gives more significance to semantics, the semantic component has remained interpretative and the generative rules has remained in the syntactic component.

2.2.3. The Correlation between Thematic and Syntactic Structures in the Recent Version of TG Theory

In his book "Lectures on Government and Binding" (1981), Chomsky presents a more crystallized argument with reference to the syntax-semantics interface in TG theory. He spares a particular sub-
theory which he calls theta theory ($\theta$- theory) discussing the essential function of semantics in the overall system (See Figure 3.2).

$\theta$- theory is concerned with the assignment of thematic roles which are:
- Agent: The person or thing carrying out the action.
- Patient: The person or thing affected by the action.
- Goal: The recipient of the object of the action.
For instance, the lexical entry for the verb "lend" would be:
[ NP, NP/NP] <agent, patient, goal>

![Figure 2.2](image)

**Figure 2.2**
*The Extended Standard Theory Model Based on (Atchison: 1987)*

11. Keith lent me a book.
In addition to the restriction on the syntactic categories of the complements, the lexical entries specify a θ-role restriction. Hence, a lexical entry of a verb C- Selects the syntactic categories that go with it and also S-selects the θ-roles of these syntactic categories. C-selection and S-selection as two different aspects of Government and Control Theory.

**Figure 2.3**

**GB Theory Model**

Based on (Cook: 1988) and (Aitchison: 1988)

In addition to the restriction on the syntactic categories of the complements, the lexical entries specify a θ-role restriction. Hence, a lexical entry of a verb C- Selects the syntactic categories that go with it and also S-selects the θ-roles of these syntactic categories. C-selection and S-selection as two different aspects of Government and Control Theory.
Binding Theory are connected by the common factor of government (Cook, 1988: 106).
The verb "lend" in the above sentence governs and hence C-selects the NPs "me" and "a book" as its first and second objects; it, simultaneously, S-selects these two NPs assigning to them "patient" and "goal" θ-roles respectively.

2.3. The Post-Chomskyan Approaches:
2.3.1. Interpretive and Generative Semantics

Despite the fact that the generative semanticists had, generally speaking, accepted the main principles presented in Chomsky's theory, they disagreed in certain aspects. Yet, they share the assumption that semantics should play a more essential role in linguistic theory (Simpson: 1979).

In opposition to Chomsky's model based on the notion of the autonomy of syntax, two trends in semantic research appeared at one fell swoop. The first trend adopted by Jerrold J. Katz and Jerry A. Fodor in their article "The Structure of a Semantic Theory" (1963), and the second adopted by John Ross, Paul Postal, James McCawley, and George Lakoff. Lackoff had the initiative in his article "Towards Generative Semantics" (1963).

The first trend was called the "interpretive semantics" which developed the TG theory conceptions shedding more light on the syntax-semantics interface. Katz and Fodor (1963) assume that a native speaker is equipped not only with an innate ability to distinguish between the well-formed and ungrammatical strings as explained in Chomsky (1957) but also with the ability of rendering various semantic readings of sentences that share the same deep structure such as:

12.A. Two chairs are in the room.
12.B. There are at least two things in the room and each is a chair.
13.A. The ball was hit by the man.
13.B. The man hit the ball.

Katz and Fodor (1963: 176) add:

A semantic theory describes and explains the interpretative ability of speakers by accounting for their performance in determining the number and content of the readings of a sentence, by detecting semantic anomalies, by deciding on paraphrase relations between sentences, and by marking every other semantic property or relation that plays a role in this ability.

The second trend, which was called the "generative semantics", went too far in its opposition to the Chomskyan's account of the
syntax-semantics interface. Lakoff (1963), the most enthusiastic semanticists among his group, states:

The approach taken by Katz, Fodor, and Postal has been to view a semantic theory as being necessarily interpretive, rather than generative. The problem, as they see it, is to take given sentences of a language and find a device to tell what they mean. A generative approach to the problem might be to find a device that could generate meanings and could map those meanings onto syntactic structures.

Lakoff’s main argument against the interpretative semanticists was sentences like 12 and 13) which have the same meaning do not have the same deep structure; rather they have different deep structures. He cites the following counter-examples:

15.A. I made that clay into a statue.
15.B. I made a statue out of that clay.

In brief, the generative semanticists kept expanding the generative power of semantics in the deep structure to the extent that the underlying and the semantic structures became alike. Accordingly, the base component proposed by Chomsky (1957) was irrelevant, and hence replaced by the semantic representation as illustrated in figure (2.4).

![Figure 2.4](image-url)

**Figure 2.4**
**Generative Semantics Model**
**Based on Leech (1976)**
2.3.2. Case Grammar

The model of case grammar was presented initially in a paper entitled "Case for Case" at 1968 written by the American linguist Charles Fillmore. The paper was an attempt to classify the verbs with reference to a group of cases suggested by Fillmore. Although the basic principles of the theory have been preserved by its advocates, some modifications have been proposed by several authors including Fillmore himself (Cook, W., 1989:35).

By "case" Fillmore went away from the traditional inflectional variations of nouns and referred to a set of abstract semantic concepts that categorize various types of consideration that a man is able to formulate about the antecedents happen around him (Crystal: 1988). Fillmore's principal list of cases is clarified in the following table:

<table>
<thead>
<tr>
<th>The Title Given to the Case</th>
<th>The Symbol Given to the Case</th>
<th>Semantic Interpretation of the Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGENTIVE</td>
<td>A</td>
<td>Animate; instigator of the action</td>
</tr>
<tr>
<td>INSTRUMENTAL</td>
<td>I</td>
<td>Inanimate force or object</td>
</tr>
<tr>
<td>DATIVE</td>
<td>D</td>
<td>Animate being affected by the action</td>
</tr>
<tr>
<td>LOCATIVE</td>
<td>L</td>
<td>Location of the action</td>
</tr>
<tr>
<td>OBJECTIVE</td>
<td>O</td>
<td>Semantic most neutral case</td>
</tr>
<tr>
<td>FACTITIVE</td>
<td>F</td>
<td>Objects resulting from the actions</td>
</tr>
</tbody>
</table>

Table 3.1

Fillmore's Cases: Based on Fillmore's (1968)

Fillmore (1975:3) assumes that he is not able to state any criteria of the priorities of cases in the deep structure, or whether the list of cases he identifies has a clear-cut end, or even the semantic nature of the cases themselves. He proposes the following principle in his first paper: "If an A is present, it becomes the subject; Otherwise, if there is an I it becomes a subject, otherwise the subject is the O". The following example illustrates the statement:

16. John gave (A) the books to my brother.
17. The books (I) were given to my brother by John.
18. My brother (O) was given the books by John.

Cited in Simpson (1979)

According to Fillmore (1968), all these sentences share the same deep structure; a position that is also taken by the interpretive semanticists discussed above.
As far as the syntax-semantics interface is concerned, case grammar emphasizes on the notion that the semantic associations of the cases are obviously of a semantic logical nature rather than of a syntactic one and they should be located in the deep structure as a starting point. Thus, the semantic representations should be considered prior to the syntactic ones in the linguistic theory as illustrated in figure (2.5).

![Figure 2.5 Case Grammar Position: Based on (Crystal: 1988)](image)

2.4. Some Psycholinguistics and Neurolinguistic Perspectives to the Syntax- Semantics Interface in Linguistic Theory

Several models of sentence processing have been proposed in both psycholinguistic and neurolinguistic studies. Most of these studies are presented to support or refute particular linguistic theories. For instance, in the field of experimental syntax, many studies such as Millar and Mckean (1964), Savin and Perchonock (1965), and Clifton and Odom (1966) support Chomsky’s hypothesis that a generative grammar is associated directly with language processing (Prideaux, G. 1984: 107). The concepts of the underlying structures or the deep structures, surface structures, and the power of transformational rules were investigated mostly by providing the subjects with ambiguous sentences to examine whether the language user constructs the meaning of the sentence depending on his innate syntactic knowledge even before knowing the context in which this sentence occurs. After knowing the context, the language user will correct or confirm his already-made assumption (Kess & Hopp: 1981).
Contrastively, in the field of experimental semantics, the semantic concepts of sense and reference relation, the various types of meaning, the syntagmatic and paradigmatic lexical relations etc. have been investigated by various studies since 1960s. For instance, Clark and Stafford (1969) examined the semantic features theory in terms of the marked/unmarked semantic features associated with particular constructions such as progressive vs. non- progressive, perfective vs. non- perfective and present vs. past tenses. Fillenabum and Rapoport (1971), on the other hand, investigated the nine semantic domains of color terms, kinship terms, pronouns, emotion names, proposition, conjunctions, verbs of possession, verbs of judging, and evaluation terms. In this study the researchers used asked their subjects to propose a judgment about the similarity among the items given in a particular set. Moreover, in the field of propositional representation, several studies have been presented (Carpenter & Just, 1975, Kintsch & Keenan, 1973, and Kintsch & Glass, 1974). In this last study, Kintsch and Glass found that 91% of their subjects were able to recall sentences with simple proposition such as (19.A.), whereas only 61% of their subjects were able to recall the surface structure of sentences with a more complex proposition such as (19.B.).

19. A. The settler built the cabin by hand.
19. B. The crowded passenger squirmed uncomfortably.

All of the studies cited above depend on what is called the modular model of language processing (see figure. 2.6.) which is based on the assumption of language components suggested by Chomsky (1957, 65, 79, and 81); i.e. each level of language syntax, semantics, phonology etc. are processed independently from the others.

The most typical example of the modular model in sentence processing is what is called the serial modular such as the one proposed by Frazier (1987) which he called the Garden Path Model. This serial modular assumes that sentence processing is initially performed by a language user on syntactic considerations, whereas the semantic and contextual considerations are retrieved in a later stage to confirm or refute the syntactic parsing. Such an assumption has been supported by a recent study proposed by Friederici, Angela D. & Jürgen Weissenborn (2007) who investigated what is called the “Early Left Anterior Negativity” (henceforth ELAN). The ELAN was proposed initially by Friederici, A. who examined the responses of her German subjects to several phrase structure violations such as those presented in 20.A. and 20.B. below:

20. A. The pizza was eaten.
* 20. B. The pizza was in the eaten.
Another experimental study that supports the two serial modular studies cited above is that presented by Gleason, J. & N. Ratner (1993) in which they emphasize clearly the notion of syntactic autonomy suggested by Chomsky and his followers. Their technique was to insert a click into a recorded sentence and then asked the listeners to say at which point in the sentence they thought the click had occurred; in the following example, each one indicated a particular position of the click:


It was demonstrated that subjects tended to be more accurate at saying where the click occurred when it had been presented between clauses than within it. Thus, it was argued that formal syntactic considerations alone were sufficient to tell the listener where the clause boundary had occurred.

The second modular of language processing is called the interactive modular (see figure 2.7) in which all the components of language are processed simultaneously and act as competing sources of information. In a recent neurolinguistic study, Sharon L. Thompson-Schill (2005) challenges the traditional common view that the Broca's area is the location wherein syntax is processed (Zurif, E., Swinney, D., Prather, P., Solomon, J., Bushell, C., 1993; Grodzinsky, Y., 2000; Fiebach, C.J., Schlesewsky, M., Lohmann, G., von Cramon, D.Y., Friederici, A.D., 2005). Sharon L. (2005) assumes that it is an oversimplification to suggest that the language user makes use of the Broca's area in retrieving the syntactic considerations alone in language processing. She states:

This hypothesis may have implications for a long-standing debate in the study of sentence comprehension...We suggest that sentence comprehension depends on a resource that is better characterized as a non-mnemonic process than as a mnemonic capacity. That is, the single resource may be the ability to select between competing sources of information, which is necessary both for some working memory tasks and for some sentence processing tasks.
3. Syntax-Semantics Interface in Optimality Theory Framework

The architect of OT is based on three major components; the generator (GEN), the evaluator (EVA), and a system of ranked constraints (CON). These three components work on the basis of the following three principles:

1. A set of language-universal inputs is assumed.
2. The GEN receives these inputs to generate them into a feasible group of competitive candidates.
3. The EVA receives these competitive candidates and selects the optimal output with the help of language-particular constraints (CON).

Thus, the basic generative nature of the morpho-syntactic component proposed by Chomsky in his early theory of TGG is preserved in addition of the scheme of constraints on the process of transformation which appeared principally in Ross (1967) in his book "Constraints on Variable in Syntax" developed in Chomsky (1973) "Conditions on Transformations". Consequently, the basic Chomskyan assumption regarding the syntax-semantics interface has continued untouched by Prince & Smolensky (1993) and the majority
of their followers. Yet, some of OT adopters elaborate the functions performed by the above-mentioned components to shed some light on the thorny issue of the syntax-semantics interface.

Leooonor van der Beek Bouma (2004), for instance, challenges the basic theory of the richness of the base (henceforth RotB) proposed by Prince & Smolensky (1993) assuming that it disregards the role of the lexicon as a “source of syntactic variation”. Accordingly, he assumes that the lexicon should be associated to the GEN component as an “extra argument” to overcome the consequences of considering the presence and absence of a lexical item as an output of the grammar as mentioned in Samek-Lodovici (1996). Furthermore, Bouma (2004) criticizes the alternative proposal of Noyer (1993) and Kusters (2003) of proposing the inviolable constraint of LEXICALITY and [LEX] since they “increase the complexity of EVAL”.

On the other hand, Andrews D. Avery (2005) proposes what he calls "glue-logic based semantic interpretation to OT-LFG" in which he develops the basic scheme of the Lexical Functional Grammar in its Optimality Theory perspectives (henceforth OT-LFG) presented by Bresnan (2001). Andrews assumes that it is important to present two kinds of lexicon, semantic and morphological; both of them generates various but related types of input candidates. He sates: "The splitting of the lexicon will be seen to have some desirable properties in accounting for certain properties of the interface between semantics, syntax and morphology". As an illustration, he provides the example of the verb "go" which has the following formal and meaning alternatives:

1. **Formal alternatives**: /gow/, went/, /gɔ/
2. **Meaning alternatives**:
   A. Mary **went** to the store.
   B. The milk **went** off.
   C. The alarm **went** off.
   D. Susan **went** off at the children about the state of the kitchen.

Andrews' (2005) recommended that the lexicon is completely different from the one proposed by Bouma (2004). Andrew's lexicon is separated to spare a clear-cut division for semantics to generate potential inputs candidates; a position comparable to that adopted by the generative semanticists explained in 2.3.1 above, whereas Bouma (2004) does his best not to be in opposition to the syntactically-based outlines of OT; he states "we propose to view a language particular lexicon as an argument in GEN, technically only a small formal adjustment to OT".

Another important approach, in this respect, is the one adopted by a group of researchers and appear in Reinhard Blutner (1998 & 1999),
Hoop, H. & Swart, H. (1998), Hendricks, P. & Hoop, H. de. (2001), Hendricks, P. & Hoop, H. (1997), Beaver, D. & Lee, H. (2003) and Hoeks, J. & Hendricks, P. (2006). These researchers expend a great deal of effort in associating semantics in the general framework of OT. They hold the assumption that there is a great difference between OT applied to phonology, morphology, and syntax and the one applied to semantics. They propose what they call the "bidirectional optimization" discussed in "OT semantics" as opposed to the traditional approach of "unidirectional optimization" in "OT syntax" (Blutner, 2000 and Blutner, de Hoop & Hendriks 2006). These researchers explain the syntax-semantics interface within the domain of OT in terms of natural language interpretation. For instance, Blutner (1999) assumes that the followers of the traditional unidirectional approach in OT "take the view of the speaker", whereas those who follow the bidirectional approach in OT "has to take both perspectives at the same time"; i.e. the speaker's and the hearer's perspectives in order to consider both "informativeness and efficiency in natural language processing". Blutner (ibid) proposes a considerable modification to the nature of the two major components of GEN and EVAL disregarding the CON. First, he assumes that GEN should explain the natural language semantics "in terms of a context change semantics"; with regard to the EVAL, he states:

One of my main arguments is that in the case of interpretation it is inevitable to have bidirection of optimization (from input to output and form output to input). Both directions are not independent from each other; instead, they should be interrelated in a particular way.

Hendricks & Hoop (2001), on the other hand, recommend a "free interpretation hypothesis" in which an infinite number of utterances are ruled out by the hearer to arrive at the optimal interpretation. They promote a unique syntax-semantic interaction to arrive at this optimal interpretation. They stipulate the following rule: "If there is syntactic material, then use it to determine interpretation; "If there is a discourse topic, then use it to determine interpretation". In another place in their paper, Hendricks & Hoop (ibid) differentiate between OT syntax and OT semantics assuming that "OT syntax optimizes syntactic structures with respect to a semantic input... (whereas) in OT semantics the input is a well-formed syntactic structure associated with an infinite number of possible (semantic) interpretations". As an illustration to how syntax and semantics interact on the basis of their "free interpretation hypothesis", they cite the semantic constraint of DOAP (Don't Overlook Anaphoric Possibilities Opportunities), and syntactic principle: "If two arguments
of the same semantic relation are not marked as being identical, interpret them as being distinct" assuming that these two semantic and syntactic considerations cooperate to rule out or approve the optimal candidate depending on the general direction of the discourse; i.e. whether it is a speaker-to-hearer or a hearer-to-speaker route.

In their recent article "Input-Output Mismatches in OT", Beaver & Lee (2003), on the other hand, explain that there are two "unidirectional approaches"; the "naïve OT production" which can be explained in terms of the process of language production practiced by the speaker, the input is meaning (m) and the output is form (f), whereas, and the "naïve OT comprehension" is explained in terms of language comprehension or interpretation practiced by the interlocutor, the input is the form (f) and the output is the meaning (m); the first approach is the standard one adopted by the OT syntax advocates, and the second one is the one presented by Hendricks & Hoop (2001) and entitled OT semantics.

In order to overcome the optimization shortcomings caused by having many meanings for one form and many forms for one meaning or a meaning with no corresponding form "ineffability", or a form with no corresponding meaning "uninterpretability", Beaver & Lee (2003) talk about two models of "bidirectional optimization" depending on the OT language processing notion of production-based and interpretation-based optimization (see figure 3.2.); the first one is presented by Blutner (2001) to which they give the title "strong bidirectional OT model" and a modified variant of this model presented by themselves called "weak bidirectional OT model". In the course of their discussion about the difference between these two models, Beaver & Lee (ibid) assume that the strong model is useful in dealing with problems such as that of ineffability and uninterpretability, but not with ambiguity and optionally. They add:

Blutner's weak notion of optimality, which we refer to simply as Weak OT, is an iterated variant of Strong OT that produces partial blocking instead of strict blocking. In Weak OT, sub-optimal candidates in a strong bidirectional competition can become winners in a second or later round of optimization …, in Weak OT, everyone is a winner.

As an illustration they cite the example of the corresponding relations between the two forms of "kill" and "cause to die" to the two meanings of "direct causation" and "indirect causation" assuming that the input-output correcting bidirectional matching between the two forms and the two meanings is fulfilled only in terms of the Weak OT.
Summary

As presented in the text of this paper, the syntax-semantics interface has been subject to a long controversy along the modern history of linguistics and it is not clear yet which position is more concrete than others. Such uncertainty is due to the fact that all these theories are merely an attempt to describe how language works inside our minds, and hence not subject to any empirical verification. The only proposals, in this respect, which seem to stand on a solid ground, are the psycholinguistic and the neurolinguistic studies explained in 2.4. Nevertheless, even those proposals are not yet crystallized to be taken into account.

It is easy to realize that all the theories, with the exception of the traditional and structural ones, are primarily based on the original model presented by Chomsky in his "Syntactic Structures" (1957) particularly with reference to the technicalities and methodologies used in addition to many basic notions such as syntax is the core of the grammar of any language and it is prior to semantics, the generative power of the base component which is, later on, developed into the notion of "the richness of the base" by Prince and Smolensky (1993), and that of the universality of the linguistic theory. In transferring the generative power from the syntactic component to the semantic one, the generative and interpretative semanticists and Fillmore's case grammar fail to arrive at an elegant explanation that might be taken into consideration due to the difficulty in dealing with meaning in a similar scientific and formal technique that one might deal with syntax.

To the best of the researcher's knowledge, the dilemma of syntax-semantics interface might be alleviated if we think of language as a system encoded by a speaker and decoded by a listener; an
It seems natural that a speaker starts to think first to generate a set of underlying structures which constitute the semantic structure of the sentence he is thinking about. Then, he is obliged to project them via the grammatical rules of the syntactic component in order to have correct phonological interpretation; the speaker-encoding level applies the basic principles proposed by Chomsky and his followers and supported by the serial model of sentence processing suggested by the Garden Path Model of Frazier (1987) and the adopter of the Optimality Theory of Prince and Smolensky (1993) in its away-from-semantics perspective.

Alternatively, a listener receives, first, the surface structure of the sentence, that is, the phonological and semantic representations, then, passes to syntax in order to arrange and systematize these representations to facilitate the comprehension of their meanings; such an assumption is supported by the generative semantics approach of John Ross, Paul Postal, James McCawely, and George Lakoff, and partly by their counter- researchers the interpretive semanticists adopted by Jerrold J. Katz and Jerry A. Fodor, and partly by Fillmore's case grammar.
Bibliography


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المستخلص

هناك اتجاهان فيما يتعلق بأوجه التداخل بين الحدود الترميزية والدلالية في النظرية اللغوية، يستند
اهمهما على اعتبار التراكيب اللغوية في المطلق الأساسي نحو نمو وتعليم اللغة (تشومنسكي
1957-65) و (ورلندورف 1987 و هاينمان 1992) الفكرة التي طورها ودعمها فيما بعد (برينس و سمولوفسكي
1993) في نظرية الأفكار الأصلية، أما الأفكار الأخرى فيستند على اعتبار التفسيرات الدلالية هي الأساسي وهذا الأفكار يقسم إلى طبقتين، التفسيرية والتوليدية (جورج كايت وجريج فورد ولاكوف
1975) والتي طورها فيما بعد في عام 1968 في نظرية النحو المستند على الحالات الإعرابية. لقد ذهب المدخل التحليلي اللغوي في
بدايته بعيداً باتجاه الأصالة حتى المستوى التجريبي مستقلاً بعد ذلك بيد التعامل معه بجعل
المستوى الداللي، فيما أكد الكثيرون أنهما متشابهان ويعتمد آخرون عليها على الأخر ولا يصلوهم
على بعضهم. من ناحية أخرى، أكد بعض علماء اللغة وخاصة الذين أظهروا بما يسمى علم الدلالة العربية، أن التفسيرات الدلالية أكثر أهمية من الترميز في التحليل النحوي فيما ذهب آخرون في
الاتجاه المعاكس تماماً مدعين أن التفسير الداللي صعب التحليل ويجب أن يتم اعتباره من الأمور
الملقبة باللغة وليس في صميمها.

تعتبر هذه الورقة محاولة لتضمن الضوء على هذه الجد época اللغوية من أجل الوصول إلى بعض
الخطوات العريضة التي يمكن أن تفيد المهتمين بالنظرية اللغوية وطلبة ومدرس اللغة الإنجليزية كلغة
 أجنبية أو لغة ثانية من أجل تحديد أطار علمي واضح بالتعامل مع اللغة.

Notes :

1 This cited-above sentence is repeated here for the reader's convenience.
2 One may ask if the selectional restrictions work entirely on semantic bases, why did
Chomsky insist on including them within the circle of the syntactic component? It seems
that Chomsky was preoccupied with the notion that the generative power is restricted
within the border of syntax and consequently adhered to the claim that the semantic
component is purely interpretative.
3 The term "generative semantics" is used to refer to a research performed by a number of
early students of Chomsky such as John Ross, Paul Postal, James McCawley, and George
Lakoff who presented the first proposal (Harris, R., 1995:105).
4 Charles Fillmore developed the theory of case grammar in the context of Chomsky's TG
theory; yet, he shares with both the interpretative and generative semanticists the
tendency towards assigning more tasks for the semantic theory in the deep structure.
5 Walter A. Cook, SJ. Was one of Fillmore's case grammar followers who devoted the
bulk of his research from 1970s until 1990s in this field trying to use case grammar as an
instrument in both linguistic theory description and language teaching.
6 According to such an assumption the generative power of the syntactic and semantic
components is elaborated to include the pragmatic aspect of language but only from the
comprehension side of the hearer.