Syntax-Sematic Interface: Translation-Based Study of Logical Form in English And Igala

Igono Joseph

Abstract— Using logical form which is a form of check theory, this paper demonstrates the syntax-semantic interface between two unrelated languages – English and Igala. A number of model examples were offered to illustrate the possible structural and semantic interactions present in the two languages. This is done with a view to show that appropriate syntactic interpretation is not limited to Indo-European languages alone or a language of wider diffusion but to also African minority languages in the Kwa family. This paper also confirms that syntactic ambivalence can be interpreted in the two languages with the help of Logical form. Studies that border on syntax and semantic interface are beneficial to translators who need to be conversant with check theory to attain correct semantic interpretation of texts.

Keywords: Logical Form; Syntax-Semantic Interface; Check Theory; Igala Language.

1 Department of French, Federal University of Lafia Nasarawa State, Nigeria. Emai: Igono.joseph@arts.fulafia.edu.ng.

INTRODUCTION

Syntax belongs to the domain of grammar. It studies the rules governing linguistic structures of any given language. Semantic is in the domain of meaning. The meaning that linguistic structures, contexts and situations imposed on oral or written expressions. Correct semantic interpretation emerges only after a clear understanding of the syntactic structures. There are a number of levels in the syntax-semantics interface in languages. In fact, generative grammarians take it as a call of duty to demonstrate the interrelationship between syntax and semantics. They are quick to explicate at what level of syntactic representation semantic interpretation can apply. For instance, one way of interpreting logical form is through the principle of compositionality. This principle in syntax (and semantics) stands for the notion that "the meaning of a complex expression is determined by the meanings of its parts and the rules used to combine them". When this principle is applied, it has dual implications namely that:

1. The structure of a sentence is built up from smaller syntactic units from words to phrases in a hierarchical manner.
2. The meaning and grammaticality of an entire sentence can be derived from its components and their syntactic arrangement.

The challenge has often been that severally, an aspect of this principle will fail to account for what contributes to the differences in meaning between two sentences such as:

(1) "the dog eats up the vulture" [abia jẹ odene]
and
(2) "the vulture eats up the dog" [odene jẹ abia]

The principle of compositionality also raises two issues with regards to "the interpretation of a sentence determined by the interpretation of the words occurring in the sentence and the syntactic structure of the sentence". Understanding the phenomenon of structural ambiguities in a sentence like (3) and the semantic contributions of the words appearing in a sentence like (4) is not that quite easy.

(3) A man with torchlight killed an elephant [ọnẹkẹlẹ ki n'ẹmu kpa ẹfa]
(4) Everybody plays the fool sometimes [ẹnẹduu añwọ idada ikoka]

Consequently, interpreting propositions correctly is one issue that has bordered linguists but most especially philosophy and logic based semantics. This sort of semantics has revealed that understanding a sentence in a language entails knowing the TRUTH CONDITIONS (reconciliation of world with a sentence about it) and THE TRUTH VALUE (value allocated to a statement indicating whether the statement is true or false) of a sentence. This implies not only subscribing to the principle of direct compositionality but also supporting the existence of a covert level of representation which is the LOGICAL FORM.

This paper discusses what Logical Form entails, the rules that derive it and how the form manifests in merger/movement operations in two different unrelated languages – Igala and English. One will also look at the theoretical motivations for Logical Form in

Generative grammar then show the relevance and short-comings of Logical Form through this comparative study.

DEFINITION OF LOGICAL FORM

According to May, R. (1977) "a Logical Form (LF) is a level of representation which fully determines the semantics of a sentence". Logical Form in syntax is often postulated as a coherent and discrete sub-theory of any general theory of interpretation that accounts for a structural meaning of a sentence without differing to its lexical or pragmatic meaning. It is a level of representation that intervenes between surface syntax and the semantic components. By level of representation of a structure of a sentence, it is meant, that point in a derivation where representation contains only features of a unique type.

Generally speaking, there are two different levels of representation in a grammar namely Logical Form (LF) and Phonetic Form (PF). The Logical Form is that level at which representation contains only semantic features. The phonetic Form contains only phonetic features. The grammatical structures produced by merger and movement operation contains therefore, different sets of features namely grammatical (the binding rules), phonetic and semantics.

Prior to the 70s, there are two levels of syntactic representation namely the Deep-Structure (DS) and the Surface-Structure (SS). In the 70s, a third level of representation was developed by Noam Chomsky and Robert May which they called the Logical Form. This level of representation operates at
an equivalent level with the sound level (Phonetic Form); a form derives also from the Surface-Structure by the same process of transformational rules which derives SS from DS.

The model provided by May Robert looks like this:

(4) DS→SS→LF
PF

This model demonstrates the "supremacy" of syntax over semantics highlighting the impossibility of semantic interpretation if the syntactic form has not been derived to completion. This also suggests on the one hand that the syntax-semantic interface has a one-way channel of influence and on the other, that it is with the aid of the LF that one can explicate the compatibility of the grammatical features of the different words in a sentence with those of other words in the same sentence. LF-component of a grammar is therefore, the component that converts the syntactic structures produced by merger and movement operations into LF-representation. In this case, LF is an important aspect of the check theory.

LF IN GENERATIVE SEMANTIC THEORY

The precursors of transformational grammar claim ignorance of semantics but had to deal with the semantically relevant structures obscured in surface structure on

the one hand and the variations of meanings that active-passive pair produced (see Partee B.H, 2007). According to Partee, it was Kazt, Fodor, and Postal who were the first to propose how semantics theory could be developed in a generative grammar framework at the beginning of the 1960's. These three however, did not go beyond primitive semantics and surface reading of things - ambiguities, semantic anomaly and synonymy. But then, they become innovative when they insert a Neg morpheme and Q morphemes into the Deep Structure enabling Surface structure to be input into phonology and the Deep Structure alone will now be the basis for determining meaning. What was proposed is shown by Partee as this:

(6) Semantics ← Deep Structure → Surface Structure → Phonology.

This was not only innovative but provocative; an architecture of a theory where Syntax will be in the middle, mediating between Semantics on the one hand and Phonology on the other.

Though the analysis of Syntax-Semantics Interface is much more complex today, three generative semantic theories continue to give impetus to LF formulation. The first is the Katz-Postal hypothesis, a part of generative semantics, which posits abstract semantic structures for sentences. The extension by Lakoff, Ross, McCrawley gave rise to abstract deep structures and conditions for semantic well-formedness, an idea which was derived from semantic theory.

The second theory is that of conceptual semantics, the type developed by Jackendoff which aim at describing syntactic structures via correspondence rules. If these correspondence rules are well applied, formal semantic structures are obtained. Jackendoff conceptual semantics however, requires one knowing the competences needed to have these rules expressed in formal semantic structures.

The third theory is that of cognitive constraint. Closely related to conceptual semantics and again promoted by Jackendoff; the theory holds that "a level of mental representation exists at which information conveyed by language is compatible with information from peripheral systems or constrain by it". In fact, it is a way of establishing a relationship between language and human sensory organs like that of vision, nonverbal audio, smell ... etc. take for instance the conceptual structure hypothesis where it is believed that a single level of mental representation exists – the conceptual structure – and at which linguistic, sensory and motor information are compatible (Jackendoff 1995). To give a vivid illustration, consider this example.

(7) Anaju went into the room [Anaju le tunw'enyi]
[event GO [thing Anaju] [path TO [place [IN [thing [HOUSE]]]]
event, thing: conceptual constituents; TO, IN: conceptual content
IN: function that maps things into places
TO: function that maps things on paths
GO: function that maps things and paths into events
other arguments: theme, goal
theme: argument of GO, [ANAJU]
goal: argument of TO, [IN [HOUSE]]

In any given linguistics structure generated therefore, there exist according to this theory, a conceptual constituents, a conceptual contents, argument and function that maps things into paths or places.

RULES DERIVING LOGICAL FORM

There are basically two rules that derive Logical Form. The construal rules and the rules of quantifier scope. The construal rules hold if syntactic argument position can be related to another argument position given that both can be co-index to NPs and given that appropriate conditions of sameness and distinctness apply. For instance, it is possible to have the syntactic construction as:

(8) Who did what? [ẹnẹ ch'ẹnwu?]

The LF in wh-expression as shown in (8) above occupies similar position of NP indicating that wh-movement generates LF from the S-structure of S.In addition,in other constructions similar to (4) involving quantifier raising, Chomsky supports the argument that, "S is underscoped when it is adjoined to some quantified NP such as all, every, some each, etc. A typical example might be:

(9) "The police questions someone" [ipolichi t'onẹ ene].

In (9), there is the possibility of the quantifier 'someone' moves from the object NP to the subject NP such as:

(10) "someone the police questions" [ẹnẹk'ipolichit'ene].

This implies that quantifier rules generate Logical Forms for sentences containing one or more quantifiers as seen in (10) and is vital in furnishing sentences which display quantifier scope ambiguities a befitting explanation. Take for instance, the combinatory rule that states that "for any given IP clause which contains n quantified noun phrases, there are n! possible formally distinct well-formed logical forms which may be associated with it (May, 1977:2)".

LF IN MERGER/MOVEMENT OPERATION

In this section, attempt is made to demonstrate how sentences are interpreted. We have stated elsewhere above that the grammatical structures produced by merger and movement operation is not a separate level of representation, since they contain three different sets of features – phonetic, grammatical and semantics. But for any adequate grammar of language to yield to interpretation, it must contain components that explain the derivation of logical form in a sentence. That is to say that given a syntactic representation, there must exist a variable expression that discriminate in the kind of DP that it picks in a sentence. For instance, instead of the sentence:

(11) "Every adult snores" [ogijo duu añw'uñwọ]

We can have for semantic purposes:

(12) Every adult x. x therefore snores [ogijo duu (?). (?) añw'u ñwọ]

This then can be interpreted that for every value of x which is an adult, x has the property of snoring. This sentence therefore contains a syntactic representation which

derives the LF in the constituents every adult x, x snores. Note that x in Igala is represented by?

It must be remembered though that this syntactic form exists in the complement position. One must ask therefore, if syntax supplies what semantic requires for merger/movement operations since we know that given a class of operator expressions, quantifiers and wh-phrases move from the position they occupy as a result of merger operations to a clause-initial position often called spec-CP. This we can answer in the affirmative through the notational device of co-indexing in which it is believed that every moved item leave a trace. For example: (which adult$_i$) (t_i snores).

CONCLUSION

The study and analysis of Logical form has been the preoccupation of Logicians, syntaticians and semanticists. A logic-based analyses of LF as a way of understanding words/ sentence relations and truth has yielded sound principles of valid argument and inference used for instance to account for the following semantic relations which hold between sentences: The relation of synonym to synonym, The relation of contradictions to presupposition, The relation of presupposition to tautology, The relation of tautologies to contradictions, The relation of entailments.

But while Semanticists have stocked to the truth relation approach to account for semantic relations that hold between sentences, the syntaticians whose interest is the understanding of how the grammatical features carried by the different words in a sentence are compatible with those of other words in the same sentence have relied on logical form. It is believed that the syntactic structure generated by merger and movement offers foundation for computing two types of structural representation for a sentence i.e. the PF level and LF level. It is also held that some grammatical features are only interpretable if they have semantic content. It is the logical form of the sentence, not what they are about, that decides the validity of the argument.

REFERENCES

Carnie, A. (1997). *Syntax: A Generative Introduction (2nd ed.)*. Cambridge: Cambridge University Press.

Huang, James C, -T (1994). Logical Form in G. Webelhuth (ed.), *Government and Binding Theory and the Minimalist Program*, Black-well, Oxford, pp. 127-173.

Iverson, M and Jason Rothman (2008) "The Syntax-Semantics Interface in L2Acquisition: Genericity and Inflected Infinitive Complements in Non-Native Portuguese" in Joyce Bruhn de Garavito and Eleva Valenzuela (eds.). *Selected Proceedings of the 10th Hispanic Linguistics Symposium; Cascardilla Proceedings Project,* Sommerville, MA.

May, R. (1977).*The Syntax – Semantics Interface*.WS 07/08, Uni Potsdam.

Partee, B.H. (2007). "A Brief History of the Syntax-Semantics Interface in Western Formal Linguistics". E-Copy accessible at http://people.umass.ed/partee/

Pylkkänen, L and Brian McElree (2005). "The Syntax-Semantic Interface: On-line Composition of Sentence Meaning in M. Traxler and M.A Gernsbacher (Eds.), *Handbook of Psycholinguistics* (2 Ed.), NY: Elsevier.

Radford, A, Martin Atkinson, David Britain, Harald Clashsen and Andrew Spenser (1999).*Linguistics: An Introduction*. Cambridge: Cambridge University Press.

Radford, A. (1997). *Syntax: A Minimalist Introduction*. Cambridge: Cambridge University Press.

Seminar Scripts (2006).Logical Form (LF). PS/PH, Generative Theory, 06/06/2006.

Sauerland, U. and A. Von Stechow (2001)."Syntax-Semantic Interface".*International Encyclopedia of the Social and Behavioral Sciences*. Elsivier Science Ltd. Pp. 15412 – 15418

Van Valin, Robert D. Jr (1999). "Generalized Semantic Roles and the Syntax-Semantics Interface".

Yule, G. (2007). *The Study of Language (2nd ed.)*. Cambridge: Cambridge University Press.