# Verbs of Cognition in Igbo: A Reanalysis

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## Abstract

Verbs of cognition which refer to an Experiencer NP's mental processes is argued to describe an entity's unconscious behaviour. Traditionally marked as mental process verbs (Fillmore 1968, Uwalaka 1988), this definition which aligns with the structural properties of the generative grammatical framework poses a critical challenge to Igbo in the generation of more verbs of cognition because of the Igbo verbal system as it is less productive in Igbo. This study therefore aims to reanalyze verbs of cognition in Igbo using the theoretical framework of the Role and Reference Grammar Approach (RRG) proposed by Van Vallin and Lapolla (1997) and Van Vallin (2005). RRG applies the principles of the triad interface of syntax-semantics-pragmatics to decipher verbs of cognition embedded in the intuitive knowledge of the speakers of the language using the inherent temporal properties existing in the language. To analyze verbs of cognition in the language therefore, the Layered Structure of the Clause (LSC), the Aktionsart principles and the logical structures are used to decompose verb structures. This study adopts the descriptive survey research design, the data are obtained from literary Igbo novels and the researcher's native intuition. Applying the theoretical framework of the decomposition principles of RRG by Van Vallin and Lapolla (1997) and Van Vallin (2005), it is observed that more verbs of cognition in Igbo can be realized through grammaticalized Metaphorical Expression and Figures of Speech. Others are Evidentials using the Macrorole Transitivity. Indications prove that verbs of cognition in Igbo is found not to lie strictly on verbs in a clause as mental processes but more on the co-occurrence of the verb and the nominal complement (V+N predicate). In the clauses *Ọ nà-āwá ji* 'He is cutting yam' and *Ọ nà-àwá ànyá* 'He is arrogant' proves from the perspective of the intuitive speaker that though they have the same grammatical structure, the latter is a cognition clause. This is because, the cognition meaning lies on the co-occurrence of the Verb+Nominal element *wá ányá* 'arrogant' and not on the verb *nà- àwá* 'is cutting'. The study concludes that these sources which are originally part of the Igbo structures should be integrated into the verb classes as sources of cognition features in Igbo.

**Keywords:** Verbs, Verbs of cognition, Macrorole transitivity, grammaticalization, metaphoric expressions, evidentials, semantic roles

## Introduction

Verbs of cognition found prominence in the classification of verbs into classes through the works of Fillmore (1968) and have been analyzed in different languages adopting various linguistic approaches and frameworks. Traditional definition following generative grammatical frameworks conclude that verbs of cognition designate mental process verbs. Verbs of cognition refer to the mental process verbs which are meant to express mental actions, otherwise mental processes (Nike, Eva and Bima 2013, Halliday and Matthiessen 2004, Fillmore 1968, Uwalaka 1988). It has been known to be productive in many languages and has been used for analysis in the Igbo language adopting other linguistic approaches. The works of Fillmore (1968) using case grammar approach and Halliday and Matthiessen (2004) adopting the systemic functional grammar (SFG) have analyzed verbs of cognition in English and arrived at the conclusion that they are strictly mental process verbs. Such verbs it is believed, make direct reference to the basic human mental activities or states which appeal to unconscious behaviour (Fillmore 1968, Niesser 1976, Halliday and Matthiessen, 2004, Nike, Eva and Bima 2013, Rhee 2001, Uwalaka 1988). According to this research, as mental process verbs, verbs of cognition cannot co-occur

with activity verbs, as perception verbs or with an instrument NP. Also, cognition verbs as part of the experiential groups of verbs "necessarily require an animate entity" since only an animate entity can perform actions. Some linguists have argued in favour of this criteria for defining verbs of cognition (Rhee 2001, Fillmore 1968, Halliday and Matthiessen, 2004, Uwalaka 1988, Nike, Eva and Bima 2013). For them, the verbs 'think', 'know' and 'believe' are the basics of cognition verbs. Others like Fauconnier (1998) and Y'Dwelle (2006) have however argued otherwise. They believe that verbs of cognition can depict both unconscious behaviour (as a process) and conscious behaviour (as a product) depending on language use. The Igbo grammatical structure can attest to this assertion.

The definition of cognition verbs as strictly mental process verbs as this research work argues however, do not align with the verbal structure of the Igbo language. The Igbo language is believed to be a verb-based language (see, Green & Igwe 1963; Emenanjo, 1978, 2005, 2015; Oluikpe, 1979; Nwachukwu, 1983; Uwalaka (1988), Mbah 1999, 2006, Mmadike, 2015). The understanding of the Igbo clause depends largely on the meaning depicted in its predicate structure with reference to the knowledge of the speakers of the language. As such, the Igbo grammatical structure depends on communication and cognition in the expression of meaning. Verb structures in Igbo adhere to the semantic and pragmatic arrangement whereby the relationship between the verb and the nominal element in the core of the clause generate one semantic unit. For instance, the clauses *Ọ nà-āwá ji* 'S/He is cutting yam' and *Ọ nà- àwá ànyá* 'S/He is arrogant' are indications from the perspective of the intuitive Igbo speaker that the meaning lies in the verbal unit which forms one semantic unit known as the V + N co-occurrence. It is also obvious that though they have the same grammatical structure, the latter is a cognition clause. The basic contention of this study is that if this intrinsic property existing in the language can be used as a parameter for the analysis, then the criteria of cognition verb as a purely mental process verb is neither acceptable nor productive in Igbo.

Considering the above, this research work is thus motivated to re-define and reanalyze the Igbo verbs of cognition using the parameters of the syntax-semantics-pragmatics interface of RRG theoretical framework in accordance with the intuitive knowledge of the speakers of the language. It would also align itself with the major views and objectives of RRG which states that each language has inert property which equips it with the descriptive tools of analysis. Adopting the decomposition account of RRG, it would seek to describe verbs of cognition and also, generate verbs of cognition in Igbo using the inherent temporal properties of the language rather than the imposition from the communicative and cognition needs of other languages. This paper believes that, grammaticalization, a system of configuring metaphorical expressions is known to constitute a fundamental inherent temporal property of the grammatical features of Igbo clause. Idiomatic expression locates a clause type in Igbo where inanimate entity is grammaticalized to perform an action while Evidentials also contribute to the meaningful cloning of verbs of cognition in Igbo. These features are basically productive in the production of verbs of cognition in Igbo.

This work is of the view that verbs of cognition in Igbo considering its unique grammatical structure, can be generated both as mental process verbs and from other inherent grammatical framework in the expression of meaning. The scope of this paper is also limited to verbs of cognition in Igbo. This work will essentially build on RRG's components to explore options that will best describe the Igbo verbs of cognition in the language by using the features existing in the language.

**Classification of Verbs of Cognition**
**The Verb**
The verb is pivotal in the construction of meaning and communication in human language. Its importance according to Emenanjo (2015:413) to human language is synonymous to what the central nervous system is to the backbone. It plays a crucial role in the formulation of the grammatical rules of a language. In order to meaningfully explore, explain, formulate rules and analyze the grammatical structures of a language, verbs must be synthesized with meaning taking into cognizance the inherent properties in a particular language. Different theories and approaches have been applied to appropriate the universal and best definition for verbs, this lead to the classification of verbs into classes. The Igbo

verb system is a delicate, sensitive and prominent feature in the language and has been controversial. The controversial nature lead to a division among the authors and in the question of transitivity. Universally and loosely, verbs has been defined as an action word or a word that describes an action or state of events in a clause (Agbo 2013, Emenanjo 1978, 2015, Mbah 1999, 2001, Ndimele 2008). It could be overt or covert in a sentence. Concurring, Chafe (1970: 97) maintains that a verb is always present in every constructions though it may be unseen since it may have gone through the deletion process at the underlying structure level before the surface structure level. It is this need to find the meaning of verbs agreeable to the needs of a language that metamorphosed into cognition verbs.

**Verbs of Cognition**
Verbs of cognition belong to the Experiential groups of verbs and center on an entity's inner experiences (Fillmore 1968, Halliday and Matthiessen 2004, Uwalaka, 1988). Others are perception, desiderative and emotion verbs (Halliday and Matthiessen 2004) cited in Nike et al (2013: 79). Traditionally classified as mental process verbs, Uwalaka (1988: 149-157) outlines the criteria as 1. Obligatorily requires an accompanying Experiencer NP. 2. The NP must involve an animate entity. 3. The verb cannot co-occur with an instrument NP. 4. The associated Experiencer surfaces as subject case while the patient deep case surfaces as object. As mental process verbs, cognition verbs consist of three main elements or participants: senser, phenomenon and process. Senser represents the conscious being that is 'feeling, wanting or perceiving'; phenomenon is that which is 'sensed' – felt, wanted or perceived while process is the verb. The relationship of cognition as mental process verbs can be found in Arad (1998) submission. The author maintains that cognition points to the mental state or action of the participants which relates to the mind or the intellectual process for internal evaluations which are manifested through some actions described by the verb. Here, the verbs give meaning qualified to activate non-volitional actions such as frowning, smiling, frightening, shivering, e. t. c. Cognition verbs for Arad (1998) also consist of mental recognition of an abstract term and concept as the Experiencer or Senser would experience or sense them. Mbah (2015: 109) argues that though cognition can be inferred as a process but that every verb is a process when it sets an action in motion for the realization of an intended goal. Thus, once an action is realized, the verb describes the action stated by the argument of the clause. In that aspect, he argues that all Igbo verbs are process verbs. This is usually so, when there is no specified goal unless under an established context. The table below clarifies the positions of the senser, phenomenon and process:

Table 1: Mental Processes in English                       (Nike, Eva and Bima: 2013: 80).

| Senser | Process: Mental | Phenomenon |
|--------|-----------------|------------|
| Mia | Liked | the song |
| The song | was liked | by Mia |

There are however controversies among linguists pertaining its description as a mental process verb. While some believe it is classified strictly as unconscious behavior (Arad 1998, Fauconnier 1998, Fillmore 1968, Garcia-Miguel and Comessana 2004, Halliday and Matthiessen 2004, Nike, Eva and Bima 2013, Ogwụdile 2016 in Mbah 2015, Uwalaka 1988); others believe verbs of cognition must be represented both as a conscious and unconscious behavior (Mbah 2015, Fauconnier 1998, Rhee 2001 and Y'Dwelle 1976 in Aikenvald and Storch 2006.The argument here however, is that Igbo verbs have very delicate and sensitive verb system that cannot accommodate verbs of cognition strictly, as mental process verbs. The Igbo verb system according to Emenenjo (1978, 2005, 2015), Uwalaka (1988) accommodate a predicate system whereby the verb select specific nominal to infer meaning which is understood primarily by the native speakers. In order words, the Igbo native speaker "furnishes a verbal element with its accompanying nominal element" (Uwalaka 1988:33). It is this nominal element that 'mandatorily accompanies the verb' (Emenenjo 1978, 2015) and which meaning can be deciphered at the deep structure level that motivates verbs of cognition in Igbo. The outcome of some of this verb class is what we label the metaphoric or idiomatic expressions and figures of speech and which we integrate into the Igbo grammatical structure as the process of grammaticalization. For instance, in Igbo we may have:
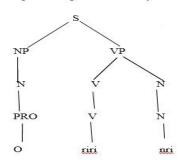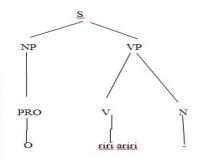
Table 2: Mental Processes in Igbo

| Senser | Process: Mental | Phenomenon |
|--------|-----------------|------------|
| Ó | Rìrì | ṅri |
| Ó | rìrìàrìrì (V+ N element) | - |

In the distribution of the mental processes in tables (1 and 2); table (1), the English version is evenly distributed because of the presence of the syntactic formation of Subject (S), Verb (V), Object (O) in tandem with the grammatical structures of universal principles. However, in anticipation of the verbal predicate system of Igbo, the metaphorical expression as seen in the 2nd column accommodates the RRG lexical decomposition in the LSC. This can be clearly viewed in the following tree diagram:



Figure 1: The Igbo Version of the Syntactic Tree Diagram    Figure 2: Igbo Version of the Metaphorical Tree Diagram

**Grammaticalizaton: Metaphoric Expressions and Evidentials**
Grammaticalization infers a cross-linguistic approach whereby semantic features are retired into grammatical forms (Archibald and Katamba 2011, Neagu 2013, O'Grady, Rhee (2001:111- 130, Perez 2008). Perez (2008:26) summarizes metaphor as the only device or mechanism that language can use to appreciate abstract concepts. Metaphoric expressions are however integrated into our culture (O'Grady, Archibald and Katamba (2011: 208). They are derived from the perception of one's culture, feelings and association. The most functional aspect of grammaticalization in Igbo which voids one of Uwalaka's (1988) identificatory parameter for Igbo cognition verbs is best described by Neagu (2013) who argues that the internal mental processes such as cognition, affection, thinking and emotions can be metaphorically represented in the domain of perception processes.
Examples of Metaporical Expressions include:

1. In English:
   a. He kicked the bucket
   b. It rained cats and dogs
2. In Igbo:
   i.    Agụụ na- agụ ya
         Hunger CONJ-PREP-hunger 3sg
         'S/He is hungry'.
   ii.   Agúú na-àghú        ya anya
         Hunger  PREP.squeeze 3sg eye
         'S/He is very hungry'

The examples above (1a & b and 2i & ii) are some metaphorical expressions in English and Igbo languages. (1a) does not mean that anybody kicked the bucket which is the literal meaning but that someone 'died' while (1b) depicts a 'heavy downpour' of rain. (2i and 2ii) on the other hand are Igbo versions which denote the state of hunger that can afflict an entity. While (2i) is a normal sentence whose verb depicts that one is hungry, the meaning in (2ii) is determined through a metaphorical expression *na-àghú ya anya* *is squeezing the eye* 'is very hungry'. Only a speaker of the language can associate with that degree of hunger. It depicts the state of hunger the entity is passing through.

Evidentials on the other hand are marked cross-linguistically, implicitly or explicitly through verbs especially verbal affixes (Matlock, 1989: 216). It combines perception verbs and cognition verbs in order to mark its meaning. Matlock (1989: 216) further claims that when this happens, the verbs semantically expand, receiving an additional evidential meaning. For instance, the perception verb 'see' can be grammaticalized to semantically express a speaker's deduction with respect to past event rather than visual perception. According to Aikhenvald and Storch (2006:3), evidential as a grammatical category has source of information as its primary meaning. Examples in English include;

English:

3.

a. I saw you eating cheerio's      (perception verb – 'see').

b. I see that you ate all the cheerios (despite seeing an empty cereal box). (Cognition verb)

c. I see that you were sick last night. (Cognition verb).

d. I heard that you did well. (Perception verb).

e. I feel that I am going to do well. (Emotion verb).

Igbo:

4.

i. Sense Modality of Taste

Perception Verb of **ịnụ útó**

    a.   **Anụ**-rụ m      ùtó      nri      a
          Hear-pst pro   taste    food    dem
          'I [heard] perceived the sweetness/tastiness of this food'

5.

ii. Sense Modality of Smell

Perception Verb of **ịnụ ísì**

    b.   **Anụ** - rụ         m    **ísì**     ofe      egusi
          Be-percieve-pst pro   smell   soup    melon
          'I perceive the aroma of melon soup'

    c.   Ana     m      anụ     isi     ọnwụ
          Be     pro    hear   smell   death
          'I perceive death'

Nos. (3a-e), (4i.a) and (5ii. b & c) are examples of evidentials in English and Igbo languages. They indicate the transfer of verbs from perception verbs to cognition verbs. In (4a-e) are different senses of perception verbs some of which meaning are crossed to cognition which only a speaker of English as L1 can sieve. (4i.a) and (5ii.b & c) are equally perception verbs of 'taste' and 'smell' which have been transferred to cognition clauses only a native speaker of Igbo can understand.

**Theoretical Framework**

This research work explores the theory of the role and reference grammar (RRG) approach proposed by Van Vallin and LaPolla (1997) and Van Vallin (2005). RRG aligns itself with the views and principles that each language has an inert potential and properties that can be used to analyze its grammatical structures yet, fall within the rubrics of the universal grammar. It abhors the imposition of one language rule to another which has no evidence of analysis in the foreign language under review. To achieve this, RRG synthesizes the interface of syntax-semantics-pragmatics to describe and analyze the grammatical structures of a language as known by the native speakers of the language. The concept of the Layered Structure of the Clause (LSC) is the prototype used in the assessment of its clause structure. In the LSC, the clausal elements which consists of the nucleus (contains only the verb), the core (the verb and the argument), and the clause (the periphery or adjunct modifiers) links the verb and the argument into a close relationship in a predicate. It adopts the Aktionsart theory proposed by Vendler (1957) to decompose the verbs. Through this medium, the lexicalization of verbs in a language can only be acceptable in a predicate system as Igbo. This is because, in the LSC, the predicate and its argument form one layer (the argument) of the clause while the periphery (non-argument) form another

layer. It must be noted that the synchrony and interface of syntax, semantics and pragmatics in the analysis of a language plays a vital role in the grammatical description and theory as a system of communicative social action.
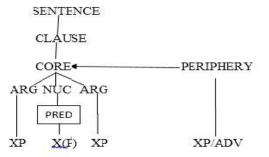


Figure 3: Formal representation of the LSC        (Van Vallin & LaPolla: 1997:31)

Thus, we may have a representation as:
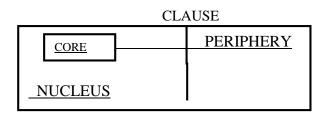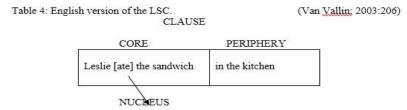Table 3: Components of the Layered Structure of the Clause   (Van Vallin, 2003:206)



Table 3 contains two unequal layers of the clause. The first contains the predicate and the argument while the other contains the non-argument layer. The predicate and its argument are the nucleus while non-argument is contained in the periphery. The predicate is isolated yet it can contain the arguments in the same environment for some languages.
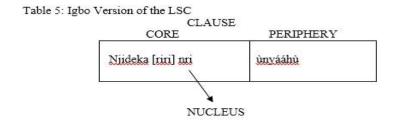For instance, in the English clause:
6.   Leslie ate sandwich in the kitchen



Table 4: English version of the LSC.              (Van Vallin: 2003:206)

In example (6), Leslie is an NP, 1ˢᵗ argument, the agent and subject; sandwich is the 2ⁿᵈ argument, an NP, the patient and a direct object, 'the kitchen' is also an NP, location and the object, while 'ate' is the verb. Note also that according to RRG, *ate* is the nucleus while 'in the kitchen' is the periphery.
In Igbo too,
7.   Njideka     rìrì          ǹrí       ùnyááhù
     Njideka     rV-past-eat   food     yesterday
     'Njideka ate food yesterday'

8.   Nrí     ka     Njideka     rì-rì     ùnyááhù
     Food    CON.   Njideka rV-past.eat yesterday
     'It is the food that Njideka ate yesterday'

Table 5: Igbo Version of the LSC

| CLAUSE | |
|---|---|
| CORE | PERIPHERY |
| Njideka [riri] nri | ùnyááhù |

NUCLEUS

Example (7 and 8) depicts the active form of an Igbo clause. It consists of the core and periphery and also representing the nucleus in the core of the verb. At the core of the clause is the simple sentence yet, with the syntactic frame – the S, V, O. The Igbo verbal predicate is contained in the core while the adjunct, the adjective, is in the periphery.

However, we also have Bound Cognate Noun (BCN) in Igbo;

9. Njideka   riri         nri         eri
    Njideka   rV-past-eat food   eat
    'Njideka ate the food'

10. Njideka           chara   ọcha   acha
    Njideka rV-past-whiten white whiten
    'Njideka is just fair'

In examples (9 and 10), we may find out that *eri* 'eat' and *acha* 'whiten' in Igbo cannot be represented by the syntactic prescription. The two nos. (9 and 10) are forms obtainable at the deep level structures spoken and understood by the Igbo speakers. In RRG, the arrangement of the grammatical forms by the LSC takes that into consideration so far as it is within the representational knowledge of the speakers of the language. Thus RRG analyzes them as: NP *Njideka,* the core *ririnri* 'ate food' and *charaọcha* 'is fair' while *eri* 'eat' and *ọcha* 'fair' are in the periphery.

RRG also identifies the existence of additional elements which may occur in a single sentence. This takes care of the formation of the passive sentence (refer to example 8 above) and position of question markers. These, according to RRG by Van Vallin (2005) are accommodated by the LSC and can occur in a simple sentence but are not universal. Here, some languages may exhibit one or two out of the four existing non-universal elements within a single clause. While the relational clauses seem to be semantically motivated, the non-relational aspects of the clause are not. According to Van Vallin, (2005), they are pragmatically motivated. The non-universal elements quite unlike the relational aspect, require linear order to determine their positions in the clause. The non-relational elements include the Pre-Core Slot (PrCS), Post Core Slot (PoCS) Left-Detached Position (LDP) and the Right-Detached Position (RDP).

The Pre-Core Slot (PrCS) represents the position in which WH-words appear before the clause. The WH-words in English can be found in the pre-core slot, that is, in clause initial position. Thus, like the right-detached position (RDP) the pre-core slot is set off from the clause by a pause. The Left-detached position (LDP) is the position of the pre-clausal element in a left-dislocation construction. The post-core slot (PoCS) is usually found in verb-final languages.

Operators are another non-universal component of the clause. They are the grammatical categories that function to modify the different layers of the clause. Examples are aspect, tense and modality. Operators are divided into three with each layer modifying different aspects of the clause. The nuclear operators cover the nucleus; it specifically modifies the action, event or state of participants without reference to the participants. The Core operators modify the relation between a core argument and the action while, the Clausal operators modify the whole of the clause. The non-relational aspect of the clause can be illustrated below;
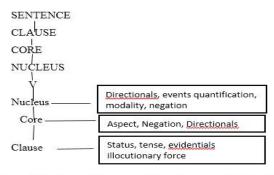
Fig. 4: The Operator Projections of the Layered Structure of the Clause     (Van Vallin, 2005)
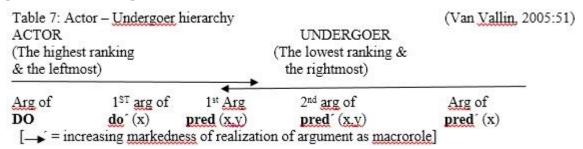
**The Lexical Representation of Verbs in RRG**

Verbs represent different states of affairs which can be classified as events, actions, processes and situations. Since the central focus of RRG approach is the lexical representation of verbs into types, RRG classified verbs into six categorized classes (Dowty, 1979): states, activities, achievements, and accomplishments, Semelfactive verbs (Smith, 1997) and the active accomplishments. The state and activity classes are the base. These are based on Aktionsart 'inherent temporal properties of verbs' (Van Vallin and LaPolla, 1997:92) distinctions.

Table 6: Classes of Verbs and their Causative Counterparts.  (Van Vallin: 2001)

i. State: The boy is afraid of the snake.
   *Causative state*: The snake frightens/scares the boy.
ii. Achievement: The soap bubble popped.
   *Causative Achievement*: The cat popped the soap bubble.
iii. Semelfactive: The light flashed.
   *Causative Semlfactive*: The policeman flashed the light.
iv. Accomplishment: The water froze.
   *Causative Accomplishment*: The cold froze the water.
v. Activity: The soldiers marched in the park.
   *Causative activity*: The sergeant marched the soldiers in the park.
vi. Active Accomplishment: The soldiers marched to the park.
   *Causative Active Accomplishment*: The sergeant marched the soldiers to the park.

The lexical decomposition of verbs into classes by Vendler (1967) is the major strength of Role and Reference grammar theory. It is based on the semantic representation of verbs or the predicating elements. An important realization of this semantic classification is the semantic relationships which hold between a verb or other predicator and its arguments. In RRG, the syntactic position of the subject and object are irrelevant, rather, it is predicate on the Actor-Undergoer hierarchy or the agent-patient relationship that is acknowledged. The relationship between the macroroles and the argument positions in LSs is captured in:



Table 7: Actor – Undergoer hierarchy     (Van Vallin, 2005:51)

The lexical decomposition of the verb is related to the semantic macroroles of the verb and this is expressed in the actor-undergoer hierarchy. In RRG, the double hierarchy depicts that, given the logical structure of a transitive verb, the leftmost argument is the actor (the highest ranking macrorole) while the rightmost becomes the undergoer (the lowest ranking macrorole). However, if the verb is intransitive, then the macrorole counts as the highest and the lowest ranking since it is the only one.

81

In its application, the verbs under construction are decomposed according to the distinctions recorded in the clauses. States verbs are known to be atelic. They depict static situations which are inherently temporally unbounded. They have non-past, timeless meaning. The subject is usually the patient which is acted upon or undergoes a state. Activity verbs are dynamic, inherently temporally unbounded state of affairs. They are atelic. Semelfactive verbs depict punctual events which have no result state. They indicate an ongoing affair/events. They cannot be used as adjectival modifier expressing a result state. Semelfactive verbs are iterative and in this situation, they behave like activity verbs but they do not require a plural subject for an iterative interpretation.

Achievement verbs express changes of states which are inherently temporally bounded. They are the direct opposite of static verbs and are telic. They express a realization of an action concluded and depict punctuality. Accomplishment verbs like achievement verbs are telic and express changes in state. However, accomplishment verbs do not designate punctuality. Active Accomplishment verb is an important cross-linguistic element. It is a telic use of activity verbs. It relates activity verbs of motion (e.g. run), consumption (e.g. eat) and creation (e.g. paint) to the corresponding active accomplishment verbs. Each of these classes has a causative counterpart. These causative constructions (the deep level structures) reflect the underlying sources of the verb classes in RRG.

Many of these classes of verbs may seem identical in their types and state of affairs. It must be noted however that they are not. They are fundamentally distinguished by the duration of events which can only be deciphered by the native speaker's knowledge of the language. The duration of events are depicted by whether an action is telic (an action that has an end) or atelic (an action that is ongoing). For instance:

11.
   a. Ọ            na - aga    ije
      3sg       CONJ.INF.go walk
      'He/She is walking'.
      Telic use of activity verb

   b. Ha          na - aga                njem
      3P          CONJ.INF.to go         walk journey
      'They are going on a journey'.
      Atelic use of active accomplishment.

The examples above (11a and 11b) provide some distinctiveness in the sense of 'going'. While (11a) depicts a journey whose termination point has no end, (11b) exemplifies a journey that has a time of termination. The telicity in (11a) is described by an infinitive predicate- 'i' affixed to the root verb – *je* 'go' while that of (11b) is described by a prefix syllabic nasal –'n' and terminated by a bilabial syllabic nasal- 'm' suffixed to the root verb *je* 'go'. A native Igbo speaker realizes that *na-aga njem* 'going on a journey' has terminative connotation.

Another distinguishing attribute of RRG, is the semantic signs and symbols used in identifying the lexical entries of verbs. In line with the conventions of formal semantics which Dowty (1979) proposed, constants (normally predicates) are highlighted in bold face, followed by a prime. Variable elements are presented in normal typeface. The elements in bold face (predicate and do) and prime (´) are not words from any particular human language rather they are part of the vocabulary of the semantic metalanguage used in the decomposition. They are same for all languages where applicable.
The variables are those lexical items from the language being analyzed. For instance, the English sentence, 'the dog died' would have the logical structure BECOME **dead´** (dog). In summary, while the constants are derived from the semantic metalanguage, the variables are filled by the lexical items from the language being analyzed. **do´** (x, Ø) represents an unspecified activity. For instance;

Table 8: Logical representations for *Aktionsart* Classes                    (Van Vallin, 2005: 38).

| Verb Class | Logical Structures |
|---|---|
| i.   State: | **predicate´** (x) or (x,y) |

| ii. | Activity: | **do´** (x, (**predicate´** (x) or (x,y)]) |
|---|---|---|
| iii. | Achievement: | INGR (ESSIVE) **predicate´** (x) or (x,y), or  INGR **do´** (x) [**predicate´** (x) or (x,y)]) |
| iv. | Semelfactive: | SEML **predicate´** (x) or (x,y) SEML **do´** (x, (**predicate´** (x) or (x, y)]) |
| v. | Accomplishment: | BECOME **predicate´** (x) or (x, y), or BECOME **do´** (x, (**predicate´** (x) or (x, y)]) |
| vi. | Active Accomplishment: | **do´** (x, (**predicate1´**: (x,(y)]) & INGR predicate2´ (z, x) or (y) |
| vii. | CAUSATIVE: | α cause β where α, β  are LSs of any type |

In line with the conventions of formal semantics which Dowty (1979) proposed, constants (normally predicates) are highlighted in bold face, followed by a prime. Variable elements are presented in normal typeface. The elements in bold face (predicate and do) and prime (´) are not words from any particular human language rather they are part of the vocabulary of the semantic metalanguage used in the decomposition. They are same for all languages where applicable.

The variables are those lexical items from the language being analyzed. For instance, the English sentence, 'the dog died' would have the logical structure BECOME **dead´** (dog). In summary, while the constants are derived from the semantic metalanguage, the variables are filled by the lexical items from the language being analyzed. **do´** (x, Ø) represents an unspecified activity.

Table 9: English verbs with their logical structures          (Van Vallin and LaPolla: 1997)

**i.    STATES**

| Pat is a fool | be´ (pat, [fool´]) |
|---|---|
| The cup is shattered | shattered´ (cup) |
| Kin is in the library be-in´ (library, kim). | |

**ii.    ACTIVITIES**

| The children cried | do´ (children, [cry´ (children)]) |
|---|---|
| Carl ate pizza | do´ (Carl, [eat´ (carl, pizza)]). |

**iii.    ACHIEVEMENTS**

| The window chattered | INGR shattered´ (window) |
|---|---|
| The balloon popped | INGR popped´ (balloon) |

**iv.    SEMELFACTIVES**

| Dana glimpsed the picture | SEML see´(Dana, picture) |
|---|---|
| Mary coughed | SEMLdo´ (Mary [cough´ (Mary)]) |

**v.    ACCOMPLISHMENTS**

| The snow melted | BECOME melted´ (snow) |
|---|---|
| Mary learned French | BECOME know´ (Mary, French) |

**vi.    ACTIVE ACCOMPLISHMENTS**

| Chris ran to the park | do´(Chris, (run´(Chris)]) & INGR be-at´ (park, Chris) |
|---|---|
| Carl ate the pizza | do´ (Carl, [eat´ (Carl,pizza)]) & INGR consumed´(pizza) |

CAUSATIVES

| The dog scared the boy | (do´(dog, Ø) CAUSE (feel´ (boy, [afraid´)]) |
|---|---|
| Max melted the ice | (do´ (Max, Ø)] CAUSE (BECOME melted´(ice)]) |
| The cat popped the balloon | (do´ (cat, Ø)] CAUSE [INGR popped´baloon)]]) |

**Data Analysis**
**Mental Process Verbs**
Traditionally, verbs in Igbo that indicate cognition verbs are usually found in state verbs. They are distinguished from other verbs by the fact that they are said to be purely mental process verbs. That is, they describe state of affairs that do not depict activity. It is evidently clear according to Mbah (2015) that all verbs are processed in the brain but the final output determines the mental process verbs from non-mental process verbs. In the data below, some verbs are provided. From the examples that follow, the logical structures and M-Transitivity in the aktionsart test will be used to distinguish which of the verbs are mental process verbs and which are not. Our data include:
12.

| | | |
|---|---|---|
| a. | ísí ǹrí | 'to cook' |
| b. | ítūkwàsà obì | 'to trust' |
| c. | ígbā ǹchèzọ | 'to trust' |
| d. | ítụ ǹkú | 'to break firewood' |
| e. | íchè échìchè | 'to think' |

**Aktionsart Tests for Mental Process Verbs s**
13.

    a.   Nné   Ngózí   sìrì   ǹrí
         Mother Ngọzị  IND.cook food
         'Ngọzị's mother cooked food'
LS: **do′ cook** (Ngozi's mother, food)
M-Transitivity (Ngozi's Mother, food)
Action/Event: Telic.

    b.   Nna m       tū-kwà-sàrà    Chukwu óbì
         Father 1sg      put-on rV.assert. God heart
         'My father trusts in God'
LS: **SEML trust′** (nna m, chukwu, óbì)
M-Transitivity: Nna m, chukwu.
Action/Event: Atelic

    c.   Onye ǹkùzí   chèzòrò    ákwúkwó á
         That teacher   forget.rV.past book    that
         'The teacher forgot the book'
LS: INGR **forget′** (Onye ǹkùzí, ákwúkwó á)
M-Transitivity: Onye ǹkùzí
Action/Event: Atelic

    d.   Emeka   tùrù    ǹkú
         Emeka    split.IND firewood
         'Emeka split the firewood'.
LS: **do′** (Emeka [**break**ǹkú)])
M-Transitivity: Emeka, ǹkú.
Action/Event: Telic

    e.   Ngózí  chèērè  dí        ya     échíché ómá
         Ngọzị IND.think husband     3sg     thought good
         'Ngọzị thinks good of her husband'.
LS: **think′** (Ngózí, dí yá)
M-Transitivity: Ngózí
Action/Event: Atelic

In the examples above, (13a-e) are constructions with Igbo verbs. The verbs in (13a and d) are not cognition verbs, while (13b, c and e) are cognition verbs. In (13a), *Nne Ngọzị* 'Ngozi's mother' and *nri* 'food' are nominal elements that have equal semantic realization as in (13d). *Nne Ngọzị* and Emeka have subject features and have agentive semantic roles, *sìrì* and *tùrù,* are verbs while *nri and nkụ* are objects and play patient semantic roles. They are transitive verbs respectively. In (13b, c, e), though some are transitive while others are intransitive, but that did not confer on them the title of transitive verbs. Semantically, the food is the undergoer which is acted upon by the nominal subject, *Nne Ngọzị.* According to M-Transitivity formula in RRG therefore, (13a and d) have a transitive features. In (13b, c and e) however, we have cases of two nominals and three respectively but have only one or two that are M-Transitive. For instance, (13b) has three nominal cases: *nna m* 'my father', *chukwu* 'god' and *obi* with only *nna m* 'my father' and *chukwu* 'god' in the M-Transitivity.

From the foregoing, the examples above (13a-e) distinguish mental process verbs of Igbo cognition verbs from clauses that are not cognition verbs. Cognition verbs within the mental process verbs are usually deciphered by their Logical structures and distinguished by the Macroroles Transitivity (M-Transitivity). Since RRG identifies only two levels of transitivity known as Actor-Undergoer hierarchy, the Actor hierarchy identifies the transitivity level of the clause. According to RRG, the dominant hierarchy, the Actor plays the semantic deep roles of the Experiencer or Agent role while the Undergoer is the patient deep case. RRG unlike the syntactic case theory, do not use only nominals as the only parameter for distinguishing case roles. Thus, the logical structures in the above examples may be more than one but the identifiable M-Transitivity can be only one.

### Grammaticalization
Grammaticalization adopts three major strategies for crosss-carpeting into cognition verbs in Igbo. They are: metaphoric expression, idiomatic expression and evidentials.

### Metaphoric Expression
From our data below, a few metaphoric expressions are placed side-by-side with other verbs to sieve cognition verbs in Igbo.
### Aktionsart Tests for Metaphoric Expressions and their Logical Structures
14.
a.  Ọ  nà -  èghú  ǹrí
    3sg CONJ.be  cook  food
    'S/He is cooking food'.
LS: **do´** (2sg [**cook´ (**ǹrí)])
M-Transitivity: She/He
Action/Event: Atelic.
b.  Ódíí  nà -  **èghú  ányáókú**
    Ọdịị CONJ.be cook  envy
    'Ọdịị is envious'.
   LS: **be´** (Ọdịị [**èghú  ányáókú** (ányáókú)])
M-Transitivity: Ódíí
Action/Event: Telic

In (14a and b) the verb *nà – èghú* 'is cooking' was used. Syntactically, in Igbo and for a L2 learner, *nà - èghú* 'is cooking' is not a mental process verb or a verb that is accompanied by an unconscious behaviour. It is a verb that designate activity. It is also transitive because it has the subject which is accompanied by supposedly objects *ǹrí* 'food' and *ányáókú* 'envy' in (14a and b). However, while (14a) is an activity verb, (14b) is not. The Agent in (14b) is still the entity – the Experiencer, affected by the action of the verb. The theoretical framework in use here, RRG argues that this is the distinctiveness only understood by the speakers of the language and not the universsal structure of the grammar. It is the *ányáókú* 'envy' in (14b) that indicates cognition. This implies then that cognition does not lie in the verb of the sentence in metaphoric expression but in the co-occurrence of the verb-nominal predicate.

15.

a.  Ụmụnne        ha      nà - àwú       árú
    His sibling    3pl     CONJ.bath      body
    'His siblings are bathing'.

LS: INGR **do´** (Sibling, body)
M-Transitivity: sibling, body
Action/Event: Atelic.

b.  Ha      wùrù          àrú      ápíá
    3pl     IND.bath       body     bird
    'They are pretending'.
LS: **predicate´** (3pl [**pretend´**])
M-Transitivity: They
Action/Event: Telic.

Ápíá in Igbo is the name of a bird. This bird is a symbol of nonchalant attitude and used as a metaphor to explain an entity with such attitude. In (15a and b), the structures show the presence of a simple sentence with a subject- verb-object and a semantic description of Agent case and an Experiencer. The verb *nà-àwú* 'is bathing' is significant of one who is involved in an activity. The objects in (15a and b) are *àrú* 'body' and *àrú ápíá* 'scork bird'. The *àrú ápíá* 'scork bird' in (15b) is symbolic of Experiencer NP whose experience is being absorbed by the Agent case role at the subject position. From the knowledge of the Igbo speaker and applying the properties of the Igbo metaphoric expression, it is evident that (15b) alludes to the behaviour of a bird in respect to the actions of an entity. Thus the Agent case *Ọ* 'S/He' is inflicted by the actions of the verb. This implies that the object NP *àrú ápíá *the body of* scork bird references the behaviour of the bird in relation to an entity. Thus, we have an intransitive relation in (15b). It is the bird that signifies the cognition in the clause.

16.

a.  Jide na-èghé     ókà
    Jide CONJ.fry corn
    'Jide is frying corn'.
LS: BECOME**fried´** (Jide, corn)
M-Transitivity: Jide, corn
Action/Event: Atelic

b.  Jide     ghèrè     àsí
    Jide     IND.fry lie
    'Jide lied'.
LS: INGR **do´** (Jide [**lie´**])
M-Transitivity: Jide
Action/Event: Telic

As in the previous examples, the verbs in (16a and b) *na-èghé* 'is frying' imply the action of an entity using a particular method of food preparation to get ready a meal. However, while (16a) refers to such a preparation, (16b) uses the NP to refer to a mental process by association. *àsí* in Igbo means ' to lie'. A standard Igbo usage of the term is *ìtù àsí* (to lie), but when the term; *ìghé* àsí *to fry a lie (16b) is used we are being related with the distinctiveness or depth of the lie being exhibited by the Agent deep case.

17.

a.      Oriakụ     sàrà          éféré
        Oriakụ     IND.clean     plate
        'Oriakụ washed the plates'.
LS: **do´**(Oriakụ [**wash´** (éféré)])
M-Transitivity: Oriakụ, plate
Action/Event: Atelic

   b.        Ndị    óhí ahu sàrà          n'ónú
                 Pro.those thief   DET.IND.wash      in mouth
                 'The thieves confessed'.

LS: SEML **do´** (Thieves [**confess´**])
M-Transitivity: Thieves
Action/Event: Telic

In examples (17a and b), the verb *sàrà* 'wash' from the root verb *sá* 'to wash' is used to explain the process of cleaning an item. It is possible in Igbo language to wash a 'plate' *afere* and *ónú* 'mouth', but when a preposition is added to the term *ọnụ 'mouth'* to realize *n'ónú,* it becomes metaphorical. It is then that we have a meaning change as could be seen in (17b). If it had been *Ọ sàrà ónú* 'He washed his mouth', then there could not have been any metaphorical implication.

18.
      a.        Nwúnyèédi      ya  nà - èsí   ṅrí
                Co-wife       3sg CONJ.cook food
                'Her mate is cooking food'.
         LS: **do´** (Her mate [**cook´** (ṅrí)])
M-Transitivity: Nwúnyèédi, ṅrí
Action/Event: Atelic.

        b.  Nwúnyèédi ya   sì - rì     àgùgò
          Co-wife             3sg IND.cook stubborn
          'Her mate exhibits stubbornness'.
        LS: BECOME´ **stubborn** (Nwúnyèédi)
        M-Transitivity: Nwúnyèédi
        Action/Event: Telic.

In examples (18a and b), the root verb *si* 'to cook' in the verb phrase *nà - èsí ṅrí* 'is cooking food' is used to explain the construction referring to cooking as a form of preparing food. The constructions indicate that (18a) from the knowledge of Igbo speaker refer to one cooking while (18b) *sì-rì àgùgò* *cook stubborn 'is stubborn' refer to an act that is metaphorical.

**Idiomatic Expression**
Idiomatic expression is a linguistic device and an integral part of the grammatical structure of the Igbo language. Idiomatic expressions are abstract in nature. O'Grady, Archibald and Katamba (2011: 258) explain that people view idioms as semantic idioms. This is because the expressions idioms mark are commonly understood as expressions whose properties cannot be derived from the general principles of language. They are simply "quite remarkable". The authors maintain that idiomatic expression has both literal and idiomatic meanings which makes it difficult at times to be understood from the ordinary perspective. The semantic or idiomatic meanings evoke some kind of deep or bizzare visual image which metamorphose into Metaphoric expressions.

The traditional postulations are that, cognition verbs only admit of verbs with an Experiencer NP and which must be an animate entity (Uwalaka, 1988). Thus, a structure is grammatically wrong even when the speaker's inherent temporal property of the language states otherwise, as in Igbo language. The linguistic theory of RRG seeks, among other things, to explain the structure of language and the nature of the native speaker's knowledge of their language. The concept of clause structure in RRG is to represent the actual form of the clause in its linear sequence with all morphological features intact. Thus, each language accordingly, has innate quality, device and evidence to represent it.
In Igbo, idiomatic expressions form an intrinsic part of the native speaker's clause structure. It is a representation that takes on inanimate entity at the core of the clause. They could be the Experiencer or the Agent case. It consists of the name associated with an object, sound, deity or imaginary things. It has the same structure with the normal clause structure but with a deeper meaning.

**Aktionsart Tests for Idiomatic Expressions and their Logical Structures**

19.

    a.  Òfó    ka       ídé    jì    àwá   àlà

         Ọfọ CONJ    erosion hold   break   ground

        'One goes to equity with clean hands'.

LS: **be´** (Ọfọ, [**equity** (clean hands)])

M-Transitivity: Ọfọ.

    b.  Gìdìgìdì             bù    ùgwù ézé

         Sound.togetherness COP.be respect    king

        'The dignity of a king lies in the size of the populace'.

LS: SEML **do´** (ézé, gìdìgìdì)

M-Transitivity: ézé

    c.  O   jì   àkwà  àwụ àhú màràrà ònwé yá

         3sg hold cloth bath body EXT. know him/her 3sg

        'By the fruit, we know them'

LS: BECOME **know´** (Ò, ònwé yá)

M-Transitivity: ònwé yá

.

    d.  Èbùnù jì      ísí    éjé    ògù

         Ram    hold   head   PRE.go fight

        'The brave leader takes a bold move'

LS: **do´ (**Ram [**hold´** (Ram, head)]) & INGR **go´** (Ram, fight)

M-Transitivity: Èbùnù

    e.  Ọ   dị    ùkó      ná mbá

         3sg COP.be  scarce CONJ town

        'A scarce commodity'

LS: INGR **scarce´** (mbá)

M-Transitivity: atransitive

Examples (19a-e) as in (18a-e) is a testament that metaphorical structures in Igbo do not rely on verbs to depict meaning of actions being explained in the construction. The meaning in the sentences can be found within the whole sentence, deposited at the inherent knowledge of the speakers of the language.

**Evidentials**

Evidentials as a cross-linguistic device like the English language counterpart can be marked implicitly or explicitly through the verb especially verbal affixes. When this occurs, there is an evident change in meaning. Data in Igbo that can easily be used to highlight evidentials in Igbo include *-hú* 'see', *-kwé* 'believe' and *nú* 'hear'.

**Tests for Determining Aktionsart Tests for Evidentials**

20.

    a.  Ódógwú  hùrù   ka    nwáṅné yá    bìàrà

         Odogwu IND.see Conj. sibling 3sg IND.come

        'Ódógwú saw when his sibling arrived'

        LS: **see´** (Ódógwú,)

        M-Transitivity: Ódógwú, nwáṅné yá.

    b.  Ahùrù   m  nà   íké    gwùrù yá

         PRO.see 1sg CONJ strength IND.tire 3sg

        'I can see she is tired'

           LS: **learn´** (m, yá)
           M-Transitivity: yá

c.   Èméká   nùrù   áhà   ya
     Emeka IND.hear name 3sg
     'Emeka heard his name'.

d.   LS: **hear´**(Èméká, áhà ya)
     M-Transitivity: Èméká

e.   Ánùrù  m    íhé    mere táá
     PRO.hear 3sg thing IND.do today
     'Ilearnt of the event of today'

f.   LS: **learn´** (m, táá)
     M-Transitivity: atransitive

g.   Há kwere     nà         chúkwú ànyí  dì    mmā
     3sp IND.believe CONJ.that    god    1pl  COP.is good
     'They believe our god is good'
     LS: **believe´** (Há, chúkwú ànyí )
     MTransitivity: chúkwú ànyí.

**Summary**

In defining and producing cognition verbs in Igbo, three prolific criteria are outstanding. They are: mental process verbs, grammaticalization; which includes metaphoric expressions and idiomatic expressions and third, evidentials. One major distinguishing factor for cognition verbs despite the differences in criteria, from the data is that, they are all states verbs. They may however be telic or atelic. They are also, all spread from the six Aktionsart classes of verbs in RRG. It is undebatable that all verbs and by this reason all words are mental process words because they are processed in the mental faculty of the brain. However, the difference is that when these verbs are processed and are made to locate events, their functions differ. The data provided above claim that purely mental process verbs are verbs in the grammar of Igbo language that, cannot occur as activity verbs in a sentence. Grammaticalized verbs are verbs which can be activity verbs but are trans-located to cognition verbs because of their inherent temporal property which are acceptable to the knowledge of speakers. The Igbo cognition verbs and their derivatives; grammaticalized verbs, are activated and can be seen in the RRG framework of the layered structure of the clause in consonance with the semantic elements of the RRG formular- the nucleus contains the verb and its mandatory nominal element. It forms part of the semantic representation of the verb.

**Conclusion**

From the analyses, it was observed that verbs of cognition in Igbo can be realized through other inherent sources as metaphoric expressions, figures of speech, idiomatic expressions through the process of grammaticalization and then, evidentials. Again, applying the resources of Vendler's (1957) logical structures and the Macrorole Transitivity principles of RRG, it is noted that Transitivity in Igbo are not realized through the number of arguments in a clause but rather from the descriptions of the speaker's intuition described by the semantic roles of the arguments so described. Also, the study discovered that verbs of cognition in Igbo are not realized strictly from the mental process driven verbs only but that through the process of grammaticalization, unconscious behaviours and activity verbs can be realized as cognition verbs. Besides, the analysis shows that cognition in Igbo do not rest strictly on the verbs but on the peculiar Igbo predicate system; the co-occurrence of the verb + nominals.

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