Expression of Meteorological Events in Kiswahili

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Abstract

In the tripartite division of expression of meteorological events, a few tokens of datasets from Kiswahili had been used by Eriksen et al. (2010, 2012). This paper presents further detailed evidence to substantiate the way Kiswahili grammar expresses meteorological events encountered in East Africa. In this way, the paper contributes to the typology of the tripartite division of the mechanisms used to encode weather events. The lexical datasets were extracted from TUKI (2014), while sentences gathered from native speakers of Kiswahili mainly through targeted elicitation and grammaticality judgements. Findings in Kiswahili corroborate with this tripartite division. However, variations are apparently highlighted. For instance, while dynamic events of wind and rain are predominantly encoded by the predicate-type and argument-predicate type, thunder and lightning are realised through argument-type. These pair with static weather events of coldness and warmness. They also vary from other forms of static weather event of humidity, which is realised by argument-predicate type, together with sunshine. The findings corroborate partially with the Unaccusative Hypothesis in that Kiswahili grammar bears some weather verbs which reveal the combination of the features of unaccusative and unergative verbs. But the weather verbs dondoka 'drip, fall' and nyesha 'rain' are typically unaccusative.

Key words: *Meteorological events, Unaccusative Hypothesis, Predicate Structure, Kiswahili*

Introduction

The contribution of facts attested in Kiswahili to the theory of predicate structure had been outstandingly growing (see Whiteley, 1968; Vitale, 1981; Bresnan & Moshi, 1990; Rugemalira 1993; Bentley, 1998; Marten, 2000, among others). Also, in the analysis of the weather verbs [†], which contribute significantly to the Unaccusative Hypothesis in the theory of predicate structure (Harris, 1982; Mojapelo, 2003; Levin & Rappaport-Hovav, 2005; Clary, 2014), facts from Kiswahili grammar feature in the research on precipitation (Eriksen et al., 2010) and other weather events (Eriksen et al., 2012). Findings in this paper corroborate some findings of Eriksen et al. (2010, 2012). However, some variation of

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[†] The terms weather events and meteorological events are preferred in this article. Other terms used elsewhere include terms of precipitation, meteorological phenomena, meteorological constructions, meteorological conditions, and weather conditions (Bleotu, 2012; Eriksen et al., 2012; Andrason, 2019; Andrason & Visser, 2019).

the properties of weather verbs and nouns are also attested in the Kiswahili grammar.

Typological studies distinguish a tripartite division of mechanisms used by languages to encode weather events (Bleotu, 2012; Eriksen et al., 2010, 2012; Andrason, 2019; Levin & Krejci, 2019). The divisions include: (a) the predicate (verbal) type (weather verbs which take as subject the expletive pronoun *it*), e.g. *It rains*; (b) argument (nominal) type (weather verbs which take a nominal as subject), e.g. *Rain comes*; (c) argument-predicate (combinational) type (weather verbs which take as subject a nominal), *Rain rains* (Bleotu, 2012; Eriksen et al., 2012). The characterisation of a given language requires a fuller understanding of its grammar because variations unfold (Andrason, 2019). Kiswahili grammar is examined to figure out how it realises the tripartite division.

The analysis of the weather verbs attracts attention of the researchers concerned with the transitive-intransitive dichotomy. Scholars argue that even inherently intransitive verbs split into unergative and unaccusative (Perlmutter 1978; Harris, 1982; Mojapelo, 2003; Clary, 2014; Levin & Krejci, 2019). The central concern for weather verbs is that there are still further divisions of the unaccusative verbs. On the one hand, there are unaccusative verbs which restrict generation of cognate object constructions, while others permit it (Clary, 2014). In Bantu languages, Andrason and Visser (2017, 2019) argue that the structure related to cognate objects is central in understanding the properties of weather verbs, which primarily licence non-participant objects. But properties of intransitive verbs vary across languages as reported in the previous studies (see Perlmutter 1978; Harris, 1982; Mojapelo, 2003; Levin & Rappaport-Hovav, 2005; Clary, 2014, among others). Therefore, it is not plausible to transfer these claims to Kiswahili without a thorough undertaking of the properties of nouns and verbs which participate in the expression of meteorological events.

Ross (1995) points out the contribution of the geographical location of speakers in adaptation of the terms for description of weather events. The geographical location has major implications to the claims by Eriksen et al. (2010, 2012) who suggested two kinds of weather events, namely dynamic weather conditions (*rain, snow, thunder, wind, hail, lightening, sleet*) and static events (*sunshine, darkness, temperature, daylight, humidity*). Variations of weather events is reported for the languages of the world (Eriksen, 2010,

2012; Andrason (2019). A good case is provided by Andrason (2019:81) who found that "there is no special word for *sleet* in Polish". To express this phenomenon, speakers use a combination of *snow* and *rain*. If speakers of a European languages that experience the weather phenomenon have adopted different combined terms, then it becomes important to study how Kiswahili speakers express the weather phenomena.

A closer look at African languages throws more light into the research gap for this paper. A case provided by Andrason and Visser (2019:23) report that in IsiXhosa "the concepts of *hail* and *sleet* are usually expressed by nouns *isichotho* and *iliqhwa* respectively". But these terms can also denote thick *rain*, *cold rain* or *snow*. Within the same African language, similar terms express more concepts of weather. Now since variations are obvious across languages and within the same language family, it remains important that Kiswahili data be examined to substantiate its typical mechanisms of indication of weather events.

An Overview of the Unaccusative Hypothesis
The Unaccusative Hypothesis

In the theory of predicate structure of Fillmore (1968) and Dowty (1991), the dichotomy between transitive and intransitive verbs is given an upper hand. The central hypothesis is that transitive verbs inherently select argument(s) to co-occur with in the accusative position(s), while intransitive verbs do not display this inherent ability (see also Vitale 1981; Rugemalira, 1993; Levin & Rappaport-Hovav, 2005; Rappaport-Hovav et al., 2010, among others). The re-analysis of the properties of the intransitive verbs yielded the Unaccusative Hypothesis (see Perlmutter, 1978; Harris, 1982; Clary 2014, among others).

Within the Unaccusative Hypothesis, a dichotomy is suggested of unergative and unaccusative verbs (Harris, 1982; Mojapelo, 2003; Clary, 2014). On the one hand, inherently intransitive verbs are characterised as unergative verbs because they strictly co-occur with non-derived subjects and constitute volitional and energy-exerting agents, e.g. *run* and *talk* (Clay, 2014). On the other hand, unaccusative verbs strictly licence subjects which originate from direct objects which constitute non-volitional (non-controllable) undergoer(s) of the events described by the verb, e.g. *melt* and *flow* (Clary, 2014).

A critique to the unergative-unaccusative dichotomy arises from the cognate object constrictions (Harris, 1982; Clary, 2014; Levin & Krejci, 2019). These scholars point out that linguists have debated on the features discharged by these constructions. On the one hand, scholars have suggested that cognate object constructions are adjunctive in nature hence they occur outside the scope of the predicate. On the other hand, researchers have assumed that cognate object constructions are argumentative in character and they assign theta-roles. The properties of cognate objects fuelled further debate on the division of inherently unaccusative verbs which may generate cognate objects, e.g. *run* and *walk*, against inherently unaccusative verbs which may not generate cognate objects, e.g. *freeze* and *break* (Clary, 2014).

The facts from Bantu languages come to play in the debate of the properties of intransitive verbs which generate cognate objects (Mojapelo, 2003; Andrason & Visser, 2017). The cognate objects can be passivized, which qualifies them as subjects of the inherently intransitive verbs. However, it has been suggested that these kinds of subjects discharge the properties of theta-role theme, rather than the agentive (Mojapelo, 2003; Clary, 2014). As a result, inherently unaccusative intransitive verbs behave like other intransitives in that they do not generate volitional agentive subjects.

Given this fact, studies of meteorological events looked into the properties of the weather verbs (Eriksen et al., 2010, 2012; Bleotu, 2012; Andrason & Visser, 2017; Andrason, 2019; Levin & Krejci, 2019). In their discussion of the findings, these scholars advance points related to the theory of predicate structure, as highlighted in the preceding paragraph (as well as in section 1 above). The framework, which is adopted in this paper, suggests for the presence of inherently dynamic and static weather verbs, as discussed in section 2.2 below.

The Encoding of Weather Events in World's Languages
Tripartite Division of Mechanisms to Encode Weather Events
Researchers (Bleotu, 2012; Eriksen et al., 2010; 2012; Andrason, 2019; Levin & Krejci, 2019) propose the characteristics of the arguments and predicates for involving meteorological verbs. In the framework of analysis, two outlines have been researched on and the findings corroborate the parameters established by Eriksen et al. (2010; 2012).

Firstly, there are semantic and formal variations of the strategies adopted to express weather events. These mechanisms include argument-type, predicate-type and argument-predicate type (Eriksen et al., 2010; 2012). Eriksen et al. (2012:385) point out that "in the predicate type, the predicate of the sentence is responsible for the expression of weather. In the argument type, the argument refers to the meteorological event. Finally, in the argument-predicate type, both are involved". Variations on the tripartite division arises from the predominance of one type over the other, as has been reported for Kiswahili.

Now, what is important for this paper is the characterisation of Kiswahili by Eriksen et al. (2012). In their analysis, they imply that Kiswahili does not reveal the typical tripartite division for some weather events. Specifically, it is suggested that Kiswahili "employs the argument type for thunder, storm, lightning and wind. The nominal argument refers to the meteorological event; the predicate is a semantically bleached supportive verb. This is also the pattern available for the expression of precipitation" (Eriksen et al. 2012:395). In defence of their suggestion, they offer the examples (1-3), cited as examples (36a-c) in Eriksen et al. (2012:396).

(1) *Dhoruba*   *i-li-to-k-e-a*
     9.storm   SM9-PST-give-STAT-APPL-FV
     'There is storm/Lit: Storm happened/appeared.'

(2) *U-pepo*   *u-na-vum-a / hu-vum-a*
     11-wind   SM11-PRES-roar/growl-FV / HAB-roar/growl-FV
     'The wind is blowing.'

(3) *Radi*   *hu-ngurum-a*
     9.thunder   HAB-roar/thunder
     'It is thundering/Lit: Thunder roars/thunders.'

In the course of the presentation in this paper, I argue that even for these weather events, the predominance of the predicate-type cannot be ignored. Thus, after presenting the datasets, I will establish that Kiswahili grammar is more predominantly expressing meteorological events through predicate-type.

In addition, the lexicalisation of the terms used to express precipitation has been highlighted in the literature (Eriksen et al., 2012; Andrason & Visser, 2019). Eriksen et al. (2012:395) found that SNOWING, RAINING and HAILING appear to have experienced

generalisation in some languages. In this regard, grammaticalisation means that a single noun expresses more than one meteorological event. Kiswahili is reported to have involved generalisation motion verbs to encode precipitation.

Furthermore, Eriksen et al. (2010) point out that languages reveal variation according to whether generalization of the encoding of precipitation is based on a verb expressing precipitation only, or if this verb has a primary/secondary use as a motion verb. Kiswahili is reported to have developed the verb *nyesha* for precipitation of RAIN and SNOW (4). The Kiswahili verb *anguka* 'fall' can also be used to encode snow. The example (5) shows the use of the predicate *tanda* 'spread out' to encode precipitation. Notice that both Kiswahili examples were provided by speakers of the language as a second/third language. This is one of the reasons that the current research was envisaged to investigate the way native speakers express meteorological events in Kiswahili.[*]

(4) *(Mvua)/Theluji i-na-nyesh-a*
     (9.rain)/9.snow SM9-PRES-fall-FV
     'It is raining.'

(5) *Ku-me-tand-a*
     17-PFV-spread.out-FV
     'It is overcast.'

Two claims have been made for the Kiswahili grammar (Eriksen et al., 2010, 2012). On the one hand, thunder, storm, lightning and wind have been found to be realised by the argument-type. On the other hand, the precipitation of snow, rain and hail appears to have experienced generalisation of the verb *nyesha*, which also supports the realisation of snow, rain and hail by argument-type. In this paper, more evidence from Kiswahili have been analysed in order to re-evaluate these claims. The findings in subsequent sections show the prominence of each type.

The call for further research on Kiswahili also emanates from the variations between Bantu languages (Andrason & Visser, 2017) and European languages such as Polish and English (Andrason 2019) and English and Spanish (Bleotu, 2012; Levin & Krejci, 2019). For

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[*] This does not rule out the possible correct grammaticality of these sentences. Nonetheless, this detailed investigation of the expression of weather events in Kiswahili is required in order to characterise the language.

instance, while the tripartite structure unfolds clearly in English (Germanic language), Spanish (Romance language) constitutes two divisions, namely verbs which take the expletive, e.g. (*Truena* 'It is thundering/It thunders') and verbs which take a noun in the subject position, e.g. *El sol brilla* 'The sun shines' (meaning 'The sun is shining') (Bleotu, 2012:63).

To arrive at the proper characterisation of Kiswahili, I used a dictionary of Kiswahili (TUKI 2014) to extract all terms associated with meteorological events. In investigation of the application of the terms, I consulted native Kiswahili speakers from Tanzania*. Other speakers of Kiswahili provided sentences and judged the grammaticality of Kiswahili sentences which express weather events.

Dynamic and Static Weather Events

Eriksen et al. (2010, 2012) postulate two kinds of weather events, namely, dynamic events and static events. These two branches show a distinction of four main types of meteorological events (Eriksen et al., 2012). Table 1 indicates the distinction between the four types which arise from the tripartite division of mechanisms to encode the weather events (Eriksen et al., 2012:399).

Event type	Sub-category	Arguments	Encoding formats
Dynamic Events	Precipitation	*Rain*	*Argument-type*
		snow	*Predicate-type*
		Hail	*Argument-predicate type*
		sleet	*Generalised precipitation predicate*
	Non-precipitation	*wind*	*Argument-type*
		thunder	*Predicate-type*
		lightening	*Argument-predicate type*
Static Events	Temperature and atmosphere and light conditions	*coldness*	*Predicate-type (tendency)*
		warmness	
		humidity	
		daylight	
		darkness	
	Sunshine	*sunshine*	*Argument-type Argument-predicate type*

In the literature, it appears that *darkness* is not underscored than *moonlight*. Eriksen et al. (2012:398) present evidence from English: *The moon is shining* and *The stars are shining.* Andrason (2019) presents the argument *księzyc* 'the moon' in Polish. It seems the fourth type is not given in Bantu languages (Andrason & Visser, 2017). Perhaps this is a result of the limited weather events associated with day-and-night. But an investigation of the arguments and predicates for the fourth category is required for Bantu languages such as Kiswahili.

The basic construal of the meteorological events by Kiswahili speakers is summarized in Table 1. In sections 3 to 5, I discuss in detail the realisations of these weather events across sentences.

Table 1: Arguments and predicates for meteorological events in Kiswahili grammar

Event type	Sub-category	Arguments	Encoding formats
Dynamic events	Precipitation	*mvua* rain	Predicate-type/Argument-Predicate type
		[*mvua ya mawe*] hail	Predicate-type/Argument-Predicate type
		[*mvua ya mawe*] sleet	Predicate-type/Argument-Predicate type
		theluji snow	Argument-predicate type
	Non-precipitation	*upepo* wind	Predicate-type/Argument-Predicate type
		radi thunder	argument-type
		radi lightening	argument-type
Static events	Temperature and atmosphere and light conditions	*baridi* coldness	argument-type
		joto warmness	
		ukungu humidity	Argument-Predicate type
		nuru daylight	
		giza darkness	
	Sunshine	*jua* sunshine	Argument-Predicate type

Enconding of the Wind System in Indian Ocean

The Indian Ocean experiences two kinds of winds, i.e. north-easterlies and south-easterlies. Moshy et al. (2015:532) point out that "the Northeast Monsoon occurs from December to April and Southeast Monsoon between June and October." The rain season couples with the wind seasons. The north-easterlies are associated with rains, while the south-easterlies are always dry. This pattern is internalised by farmers and fishermen in the East African coast.

The general term for weather events is an associative noun phrase *hali ya hewa*. It derives from the combination of the term *hali* 'condition, state, circumstance' and hewa 'air, atmosphere' by the associative marker *ya* 'of'. Meteorological station is known as *kituo cha hali ya hewa*, which derives from the association of *kituo* 'station' and *hali ya hewa* 'weather events' by the associative *cha* 'of'. The meteorological department is called *idara ya hali ya hewa*, which derives from the association of *idara* 'department' and *hali ya hewa* 'weather events' by the associative *ya* 'of'. One of the elements of the weather events is wind, which is described in this section.

Based on the theory of predicate and arguments of weather verbs outlined in section 2 above, dynamic weather events are encoded by arguments and predicates. One of the weather events is wind system. The terms in (7) encode events related to the wind system in Kiswahili (TUKI, 2014). However, the characteristics of these terms cannot be complete without the proper understanding of the oceanic properties of East African coast.

(7)   ARGUMENTS
        upepo   'wind, breeze'
        kaskazi   'northerly wind, north monsoon wind, northerly direction'
        kusi   'south monsoon, southerly winds'
        tufani   'hurricane, tempest, typhoon, storm'
        dhoruba   'hurricane, tempest, storm'
        kimbunga   'typhoon, hurricane, whirlwind'

        PREDICATES
        vuma   'blow'
        pepea   'blow'
        puliza   'blow'

Apart from the typical weather events above, there are important weather related oceanic phenomena which are attested in Kiswahili (8). The inhabitants of the oceanic environments make use of the oceanic events in their day-to-day activities (Ross, 1995). In Tanzania, the behaviour of the ocean contributes significantly to the understanding of the weather events (Moshy et al., 2015; Omar et al., 2018).

(8)   ARGUMENTS
bahari   'ocean'
bahari chafu   'oceanic storm, oceanic winds'
bahari shwari   'clear/low oceanic waves'
bamvua   'spring tide'
bamvua mkuu   'high tide'
bamvua mdogo   'low tide'
mweuo   'high tide'

PREDICATES
chafuka   'storm (in ocean)'
kupua   'spill, pour out'
kujaa   'fill, pour in'

The Indian Ocean had been the heart of the Kiswahili speakers who settled along the coast of East Africa, mainly in Kilwa, Lamu, Mombasa, Pemba and Zanzibar (Nurse & Spear, 1985). Traditionally, the Kiswahili settlements were established as farming and fishing villages. Even today, fishing is conducted depending on wind system. Research by Omar et al. (2018:5595) found that "in all villages a combined cue of Wind and Lunar cycle is employed. Generally, fishing schedule is concentrated during or shortly before the new moon (Waxing Crescent) and throughout the new moon period." The notion *bamvua* 'spring tide' is central in understanding the expression of oceanic events in the tradition society of Zanzibar.

Another research has shown that "women and men work at different tasks, with men deep sea fishing and women doing the vast majority of the farming and seine fishing or shellfish collecting near shore" (Dean, 2013:23). The fishing task is learnt since childhood because the male youth join fishing crews in their early teens. The fishermen work under the age category of *mwambao* 'the coast' (Dean, 2013). As a result, the speakers of Kiswahili are aware of the characteristics of oceanic winds. For instance, Moshy et al. (2015:532) report that

"strong winds during the Southerly Monsoon make fishers vulnerable to safety and income shocks."

Narrations of the weather events in the Indian Ocean manifest Kiswahili texts. For instance, (9) illustrates the use of the predicate *chafuka* 'become dirty (storm)', while (10) indicates the use of the *kusi* 'south monsoon wind'.

(9)   *Bahari   i-ka-chafuk-a   zaidi.*
        9.sea   SM9-PFV-be.dirt-FV   much
        'The sea stormed.'

(10)   *Kusi   zi-me-anz-a   mapema*
        9.south.wind SM10-PFV-begin-FV early
        'The south monsoon winds have begun earlier.'

The example (9) indicates metaphorical interpretation of the oceanic events. The verb *chafuka* 'be dirty' is metaphorically used to refer to oceanic storm. The typical wind system may be realised by the argument-type (10). The weather arguments *kusi* 'south monsoon wind' and *kaskazi* 'north monsoon wind' are used.

Also, other economic activities depended on the wind system in East Africa. Trade between the people of the East African coast and the people from Arabian Peninsula and Persian Gulf depended on the Indian Ocean. The oceanic winds were at the core of the trade. Nurse and Spear (1985:1) point out that Arabs and Persians sailed depending on the annual northeast monsoon winds, "returning home after the monsoon winds shifted around to the southeast." The trade was conducted between Muqdisho in the north to "Kilwa, located nearer to the gold fields at the southern limits of the monsoon trade." (Nurse & Spear, 1985:3).

Tourism in Zanzibar is associated with wind conditions. With regard to wind, the argument-predicate type of strategy is adopted. The sea breeze is encoded using the argument *upepo* 'wind' and the predicate *vuma* 'breeze', as illustrated in (11). The example (12) indicates that the modification of the argument results into the change of the meaning of the weather event encoded. The phenomenon in (12) is similar to the storm which is encoded in the argument *kimbunga* 'hurricane' in (13).

(11)   *U-pepo   u-na-vum-a   pande   za   Kaskazini.*
        11-wwind SM11-HAB-breeze-FV 10.side ASSOC.10
        9.north

'The wind breezes in the northern parts.'

(12) *U-pepo   m-kali   u-li-vum-a   juzi.*
      11-wind   11-fierce   SM10-PST-storm-FV   yesterday
      'The strong wind stormed yesterday.'

(13) *Ki-mbunga   ki-li-vum-a   Unguja.*
      7-hurricane SM10-PST-storm-FV   Unguja
      'The hurricane stormed in Unguja.'

The phenomenon is common amongst people engaged in tourism industry. Gössling et al. (2006:421) point out that "the results show that differences in wind velocity and cloudiness had a significant influence on the tourists' comfort perception." Also, they show that "the heat of summer is seasonally often cooled by windy conditions, resulting in pleasant sea breezes, particularly on the North and East coasts" (ibid: 422).

It has become obvious that the wind system is encoded primarily by the argument-predicate type. However, this is not the only mechanism attested. The argument-type is also found with the nouns for wind system. These nouns may realise indirectly a different weather condition. For instance, the verb 'blow' in Kiswahili realises several notions depending on the context of use. While example (11) above shows 'breeze', the examples (12-13) show the use of the predicate *vuma* 'blow' to encode a storm.

Encoding of Precipitation
Precipitation is central in the livelihoods of the coastal people in East Africa. The primary weather argument and predicate include *mvua* 'rainfall' and *nyesha* 'to rain'. The events of beginning, culmination, and ending of the RAIN season are central in both farming and fishing activities along the coast of East Africa (Porter & Flay, 1998; Nivet et al., 2018).

Linguistically, the key terms *mvua* 'rainfall' and *nyesha* 'to rain' are dynamic in nature. The realisation of these key weather events are represented by the terms in (14).* The precipitation terms in the

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*There are supplement terms of precipitation in Kiswahili. TUKI (2014) provides these other Kiswahili weather terms related to precipitation:
masika   'long rainy season'
kipupwe 'cold windy season'
kifuku   'long rains'
kiangazi 'the hot/dry season'

Kiswahili system come from the dictionary by TUKI (2014). Their characterisation is offered consonant to the climatic conditions. Notice that though the predicates *anza* 'begin' and *isha* 'end, finish' are used here, they are not categorically related to precipitation; rather they work well with static weather events.

(14) ARGUMENTS
      mvua   'rainfall'
      manyunyu 'drizzles, light rain'
      rasharasha 'drizzle, light rain'
      barafu   'snow, skate, ice'
      theluji   'snow'
      ukungu   'fog, mist, dampness'
      unyevu   'fog, mist, dampness'
      mvua ya mawe 'hail, sleet'
      mvua ya upepo 'storm'

      PREDICATES
      nya   'rain'
      nyesha   'rain'
      dondoka   'drip, fall'
      tanda   'spread, extend, overcast'
      anza   'begin'
      isha   'end, finish'

The primacy of RAIN as a type of precipitation is not confined to East Africa; rather it unfolds in the hinterlands of Bantu speaking people. The regular rain is called *mvua* in Kiswahili, which is commonly called *pula* or *imvula* in Bantu languages (see Mojapelo, 2003; Eriksen et al. 2010; Andrason & Visser, 2017). Speakers of Kiswahili reckon of *storm* and *sleet* as *mvua ya mawe* (Lit: rain of stones), and hail as *mvua ya upepo* (Lit: rain of wind). Therefore, there is no term designated for storm and hail.

Two verbs, *nya* 'rain' and *nyesha* 'rain' had been listed in TUKI (2014:367). It appears that the *nya* construes "defacate/act/do on something/someone", as illustrated in (15) (TUKI, 2014:367). The verb *nyesha* 'rain' appears to have been generalised from *nya*, with the causative extension *ny-**esh**-a* 'cause to rain'. In fact, TUKI (2014:370) does not show the causative extension, which is a

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vuli   'short rainy season'

testimony that it is grammaticalised into the internal structure of the verb.

(15)   *A-i-sifu-ye   mvua   i-me-m-ny-e-a.*
       SM1-OM9-praise-PFV   9.rain   SM9-PFV-OM1-defacate-APPL-FV
       'He who praises something has had an experience of it.'
       (Lit: He who praises rain, it has defecated on him.'

(16)   *Mvua   i-me-nyesh-a.   leo.*
       9.rain   SM9-PFV-rain-FV   today
       'Rain has rained today/It rained today.'

(17)   *Mvua   i-me-anz-a   ku-nyesh-a   sasa.*
       9.rain   SM9-PFV-begin-FV   INF-rain-FV   now
       'Rain has begun raining now/It started raining now.'

(18)   *I-me-ach-a.   ku-nyesh-a   mvua.*
       SM9-PFV-stop-FV   INF-rain-FV   9.rain
       'It stopped raining rain/It stopped raining.'

The data in (15-18) shows some ways that Kiswahili speakers may use to encode rain. Therefore, Kiswahili grammar reveals many strategies to express rain. This corroborates the findings for Digo as presented by Eriksen et al. (2010). Also, the data above show that both argument-type (16) and argument-predicate type (17-18) can be used to encode rain in Kiswahili.

The notion *snow* is traditionally absent in the lexicon of Kiswahili perhaps because it is not experienced along the East African coast. Loans of Arabic and Persian origin have been incorporated to express snow. The typical predicate for snow is *anguka* 'drop, fall' (19); rather than *nyesha* 'rain' as has been suggested by Eriksen et al. (2012).

(19)   *Theluji   i-na-anguk-a   Kilimanjaro.*
       9.snow   SM9-PRES-fall-FV   Kilimanjaro
       'Snow falls in Kilimanjaro/It snows in Kilimanjaro.'

(20)   *Theluji   i-me-anz-a   ku-anguk-a   Kilimanjaro.*
       9.snow   SM9-PFV-begin-FV   INF-fall-FV   Kilimanjaro
       'Snow has begun to fall in Kilimanjaro/It began snowing in Kilimanjaro.'

In both examples (19-20), the argument-predicate type is adopted to encode snow in Kiswahili. This is another set of findings which does not corroborate with the findings provided by Eriksen et al. (2012) who suggested the argument-type to be predominant.

Some more language specific variation arises on the meaning of snow. The Arabic loan *theluji* 'snow' has reference to the mountain snow, as exemplified in (21). Alternatively, the other Persian loan *barafu* 'ice, skate' also has reference to the mountain snow, as illustrated in (22).

(21) *Theluji ya   m-lima   Kilimanjaro i-na-pungu-a.*
      9.snow   ASSOC.9   3-mountain Kilimanjaro SM9-PRES-
       decrease-FV
      'The snow of Mount Kilimanjaro is decreasing.'

(22) *Barafu ya   m-lima   Kilimanjaro i-na-pungu-a.*
      9. snow ASSOC.9   3-mountain Kilimanjaro SM9-PRES-
       decrease-FV
      'The snow of Mount Kilimanjaro is decreasing.'

Speakers of Kiswahili make use of argument-predicate type to encode other types of precipitation. The examples (23-24) illustrate the presence of the argument *mvuakubwa* 'heavy rain' and predicates *nyesha* 'rain' and *tanda* 'spread out'. In (23) the predicate-type is used, while in (24) the argument-predicate type is used. The difference is attested in the examples (25-26) which illustrate the presence of the argument *ukungu mdogo* 'little and predicates *nyesha* 'rain' and *tanda* 'spread out'. In (25) the argument-type is used, while in (26) thepredicate-type becomes ungrammatical.

(23) *Mvua   kubwa   zi-li-nyesh-a   Tanga.*
      10.rain 10.large SM9-PST-rain-FV   Tanga
      'Heavy rain rained in Tanga.'

(24) *Mvua   kubwa   i-li-tand-a   Tanga.*
      10.rain 10.large SM11-PST-spread-FV   Tanga
      'Heavy rain spread out in Tanga.'

(25) *U-kungu   m-dogo   u-li-tand-a   m-ji-ni.*
      11-fog   11-small SM11-PST-spread-FV   18-town-LOC
      'A little fog spread out in town.'

(26)   *U-kungu   m-dogo   u-li-nyesh-a   Tanga.*
        11-fog   11-small   SM9-PST-rain-FV   Tanga

There are further evidence to substantiate possibilities to employ the argument-predicate type to express precipitation in Kiswahili. The examples (27-28) show the use of the argument *manyunyu* 'drizzle' to express the weather event. The predicate *anza* 'begin' encodes an event outside the weather event. However, the event outside is related to the weather event, i.e. *anguka* 'fall' and *nyesha* 'rain'. Based on the predicate structure theory, we obtain the structure NP___(NP). However, the postverbal NP is optional, which qualifies it to become a typical unaccusative verb.

(27)   *Ma-nyunyu ya-me-anz-a   ku-anguk-a*
        6-drizzle   SM6-PFV-begin-FV INF-fall-FV
        'Light rains have begun dropping/drizzling.'

(28)   *Ma-nyunyu ya-me-anz-a   ku-nyesh-a*
        6-drizzle   SM6-PFV-begin-FV INF-rain-FV
        'Light rains have begun raining.'

To summarize for precipitation, the discussion above revealed that Kiswahili grammar reveals the presence of the predicate-type and argument-predicate type to encode rain. It reveals argument-predicate for other forms of precipitation, mainly SNOW and SLEET and HAIL. The characterisation of Kiswahili adds to the points advanced by Eriksen et al. (2010, 2012). Nonetheless, I argue that rather than the predominance of the argument-type for SNOW and SLEET and HAIL, as suggested by Eriksen et al. (2010, 2012), I found the presence of both argument-type and predicate-type. In fact, the predicate-type predominate the expression of precipitation.

Based on Vitale (1982), the data show further that the weather verbs provide the structure NP___(NP). This does not corroborate with the typical case of unaccusative verbs presented in Sesotho by Mjapelo (2003).

Expression of Static Atmospheric Conditions
The atmospheric conditions related to temperature, day-night times, and sun and moon light are described as static weather events (Eriksen et al. 2010, 2012). The main mechanism to encode these phenomena is through nouns (argument-type). Few predicates are

also used. (29) lists the arguments and predicates for static weather events in Kiswahili.

(29)   ARGUMENTS
   baridi   'coldness'
   boto   'heat'
   jua   'sun'
   mwezi   'moon'
   miale   'rays'
   mbalamwezi   'moonlight'
   giza   'darkness'
   mwanga   'light'
   usiku   'night'
   mchana   'day'
   nuru   'light, brightness'
   mawio   'sunset'
   machweo   'sunrise'
   radi   'thunder, lightening'

   PREDICATES
   waka   'shine, light'
   zima   'light off'
   wia   'sunset'
   chwa   'sunrise'
   angaza   'shine, light'
   chomoza   'set'
   nguruma   'roar'
   mulika   'lightening, shining'
   rindima   'roar'

There are no predicates to express abstract notions of coldness and hotness. The copulative constructions are commonly adopted to encode these stative weather events. Therefore, the weather events of this type are typically argument-type in Kiswahili.

The shining of both sun and moon are encoded by the *waka* 'shine' or *zima* 'light off'. Basically, the structure realised is primarily argument-type because the essence articulated by the verb depends on the NP that precedes it. Vitale (1981) would characterise this structure as NP____, which is typically unaccusative (Mojapelo, 2003). The examples (30-31) illustrate this pattern.

(30) *Jua   li-na-wak-a.*
    5.sun   SM5-HAB-shine-FV
    'The sun shines.'

(31) *Mw-ezi   u-na-wak-a.*
    3-moon   SM3-HAB-shine-FV
    'The moon shines.'

In the presentation of weather events in Tanzania, cognate objects manifest for two static weather events in Kiswahili. The sunset is *wia* 'to set' and its cognate argument is *mawio* 'sunset'. Likewise, the sunrise is encoded as *chwa* 'to rise' and its cognate argument is *machweo* 'sunrise'. Both terms are used to express east side and west side as well (Lusekelo, 2018). Further analysis of the cognate object constructions is provided in the subsequent section.

Cognate Object Constructions in Kiswahili

The presentation in sections three and four show the dynamic weather verbs in Kiswahili, among others *dondoka* 'drip, fall', *anguka* 'fall', *nyesha* 'rain', *tanda* 'spread out', and *vuma* 'blow'. Section five has discussed the static weather verbs such as *waka* 'shine', *angaza* 'shine', *nguruma* 'rumble, roar' and *rindima* 'rumble, roar'. These weather verbs tend to generate cognate objects, as exemplified in (32-36).*

(32) *U-pepo   u-li-vum-a   m-vumo m-kubwa.*
    11-wind   SM11-PST-roar-FV 3-roar   3-large
    'The wind roared a large roar.'

(33) *Theluji   i-li-anguk-a   anguko   kubwa*
    9.snow   SM9-PST-fall-FV 9.roar   9. large
    'The snow fell a large fall/It snowed heavily.'

(34) *Radi   i-li-ngurum-a   ngurumo   kali.*
    9.thunder   SM9-PST-rumble-FV 9.roar   9.fierce
    'The thunder roared a strong roar.'

(35) *Radi   i-li-rindim-a   m-rindimo   m-kubwa.*
    9.thunder   SM9-PST-rumble-FV 3-roar   3-large
    'The thunder roared a booming sound (roar).'

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(36)   *Jua   li-li-wak-a   mw-ako   wa-ke*
         5.sun   SM5-PST-shine-FV   3-light   3-POSS
         'The sun shines its shine.'

Both dynamic weather verbs (32-33) and static weather verbs (34-36) generate the cognate objects in Kiswahili. In reading, these cognate objects appear to provide adjunctive properties. They provide further description of the event described in the verbs. Therefore, they qualify to be adjuncts (Clary, 2014).

The cognate object noun phrases qualify for passivisation in Kiswahili. Any object NP which qualifies for subjectivisation is assumed to be a typical argument (Dowty, 1991; Rugemalira, 1993). Therefore, they reveal the feature of argumentative (Clary, 2014). This is shown in the examples (37-39) below.

(37)   *M-vumo   m-kubwa u-li-vum-a jana.*
         3-roar   3-large   SM3-PST-rumble-FV yesterday
         'A large roar rumbled yesterday.'

(38)   *Ngurumo kali   i-li-ngurum-a   usiku.*
         9.roar   9.fierce   SM9-PST-rumble-FV   night
         'A large roar rumbled at night.'

(39)   *Mw-ako   wa-ke   u-li-wak-a   jana.*
         3-light   3-POSS   SM3-PST-shine-FV   yesterday
         'Its shine shined yesterday.'

Kiswahili weather verbs which generate cognate objects include the following: *angaza* 'shine', *anguka* 'fall', *nguruma* 'rumble, roar', *rindima* 'rumble, roar', *tanda* 'spread out', *vuma* 'blow' and *waka* 'shine'. These inherently intransitive unaccusative verbs reveal some properties of unergative verbs because they generate cognate object NPs which can be passivized. Based on Vitale (1981), they reveal the structure NP____(NP).

Some weather verbs in Kiswahili restrict generation of cognate objects. They include *dondoka* 'drip, fall' and *nyesha* 'rain'. The examples in (40-41) were judged ungrammatical because the cognate objects are disallowed.

(40)   **Mvua   zi-li-nyesh-a   mnyesho   mkubwa.*
         10-rain   SM10-PST-rain-FV   rain   large

(41)   **Theluji i-li-dondok-a   dondoko kubwa*
        9.snow   SM9-PST-fall-FV fall   large

These dynamic weather verbs *dondoka* 'drip, fall' and *nyesha* 'rain'
qualify for the inherently unaccusative category because they do not
permit cognate objects. Based on Vitale (1981), they reveal the
structure NP____.

Weather Events Encoded by the Copulatives

Two assumptions are advanced in this section, vis-à-vis the copula
introduces the existential sentences (Eriksen eta al., 2010; Andrason,
2019); and the empty *pro* does not introduce the expletive in
Kiswahili, as appears to be possible in Sesotho (Mojapelo 2019).

The copulative constructions in Bantu languages are introduced by
similar elements (Gibson et al., 2019). Copulative constructions in
Kiswahili are introduced by *na* 'with, *ni* 'be' or a combination of *kuwa*
'be' and *na* 'with'. The examples in (42-46) show the use of these
copulas. The copula *na* 'with' is used for the weather event in (42),
while *ni* 'be' appears in (43-44). Both *na* 'with, *ni* 'be' manifest in
present tenses of Kiswahili. The combination *kuwa…na* 'be with' is
used in (45-46) for future tense and past tense respectively.

(42)   *Leo   ku-na   mvua   nyingi.*
        today INF-be 9.rain   much
        'Today there is heavy rainfall.'

(43)   *Jua   ni   kali   sana.*
        5.sun be   5.fierce much
        'The sun is scorching.'

(44)   *Sasa ni   usiku   wa   mbalamwezi.*
        now   be   14.night ASSOC.14 3.moonlight
        'Now it is a night full of moonlight.'

(45)   *Kesho   ku-ta-kuw-a   na   upepo m-kali*
        tomorrow INF-FUT-be-FV   with   11.wind11-firce
        'Tomorrow there will be storm.'

(46)   *Jana   ku-li-kuw-a   na   u-pepo   mw-anana*
        yesterday INF-PST-be-FV   with   11-much 11-nice
        'Yesterday there was nice wind breeze.'

Some observations can be made with regard to the predicate structure. Previous research has shown that the copular tends to introduce the issue of expletive *It* in English weather events, e.g. *It rains* or the existential *there,* e.g. *There is rain* (Eriksen et al. 2012; Andrason, 2019). The expletive and existential occur in the subject position. Research in Kiswahili shows that only the existential in basically realised by the copular element.

The examples (42-43) show that existential reading is possible with copula *na* 'with' and *ni* 'be' respectively. Likewise, the combinations in (45-46) would allow to construe the interpretation of the existential *there*. An ambiguous case is provided in (44). Nonetheless, it would be plausible to treat it as existential rather than expletive, as defended below.

There are possibilities that weather events in Kiswahili can be expressed by the predicate alone. The examples (47-48) indicate the dynamic weather verbs *nyesha* 'rain' and *vuma* 'blow' can directly be interpreted as encoding precipitation and wind respectively. There is no need for the subject NPs on the surface.

(47)   *I-na-nyesh-a.*
      SM9-PROG-rain-FV
      'It rains.'

(48)   *U-na-vum-a.*
      SM11-PROG-blow-FV
      'It storms/Itblows.'

In fact, with the weather verbs above, the subject agreement prefix is interpreted as being associated with the specific weather argument in Kiswahili. These findings corroborate with patterns of Sesotho in that "some weather nouns may be left out without giving any context and empty *pro* with *AgrS* (agreement subject) may suffice as subject" (Mojapelo, 2003:161).

It is obvious in examples above that the agreement patterns of Kiswahili allows specific interpretation of the subject markers. In (47), the interpretation will be rain, while it is wind in (48). In this regard, Kiswahili data does not provide the expletive reading. In fact, based on the lexical semantics (Rappaport-Hovav et al., 2010), the predicates *nyesha* 'rain' and *vuma* 'blow' assign the specific arguments. Therefore, the subject of the predicates is known and it

bears the thematic role of theme, which is commonly known for the unaccusative weather verbs (Mojapelo, 2003; Clary, 2014).

There are hardly cases in which the possibilities to interpret the actual weather event can happen in Kiswahili. The subject markers become necessary in the licensing of the proper weather event provided in the verbal clauses. In each of the examples (49-54) below, the proper weather event is identified by the subject agreement prefix even when the same verb is used. (49) refers to RAIN (class 9/10), while (50) denotes WIND (class 11/10). Likewise, (51) encodes SUN (class 5/6), while (52) expresses MOON (class 3/4). Even example (53) encodes SNOW (class 9/10) and example (54) expresses FOG (class 11).

(49)   *I-na-ngurum-a.*
         SM9-PROG-roar-FV
         'It roars.'

(50)   *U-na-ngurum-a.*
         SM11-PROG-rumble-FV
         'It rumbles.'

(51)   *Li-na-wak-a.*
         SM9-PROG-roar-FV
         'It shines.'

(52)   *U-na-wak-a.*
         SM3-PROG-roar-FV
         'It shines.'

(53)   *I-na-dondok-a.*
         SM9-PROG-fall-FV
         'It drops.'

(54)   *U-na-dondok-a.*
         SM3-PROG-fall-FV
         'It drops.'

The findings above do not corroborate with the findings in Mojapelo (2003:161) who found that "other weather nouns, however, are necessary as subjects of weather verbs. This is due to the fact that the weather verbs concerned may subcategorize other NPs as well."

The arguments DEW, HAIL and SUN can easily be interpreted from the weather verbs and subject agreement patterns in Kiswahili.

Conclusion

This paper has articulated the properties of weather verbs and nouns in Kiswahili. The findings corroborate the tripartite division of the mechanisms to encode weather events: argument-type, predicate-type and argument-predicate type. Nonetheless, some peculiar cases are paramount to Kiswahili. The predicate-type and argument-predicate type are primarily used for the dynamic weather events related to WIND and RAIN. They may also apply for STORM and HURRICANE, which have not been provided for in Eriksen et al. (2012). With these weather nouns, paramount predicates are *nya* 'rain', *nyesha* 'rain' and *vuma* 'blow, storm'. These predicates can be used to encode specific weather events without the manifestation of the arguments in the sentence. In a way, abstract but interpretable (theme) arguments can be deduced from sentences made of these verbs. Given this property of the predicates, Kiswahili grammar underscores the argument-predicate structure for the dynamic weather events.

The properties of the dynamic and non-precipitation weather events of THUNDER and LIGHTENING do not qualify them properly. First of all, both are realised through argument-type. They reveal characteristics similar to the static weather events (COLDNESS and WARMNESS) which are realised by argument-type.

Kiswahili primarily adopts the argument-predicate type for the static weather events related to the SUNSHINE, MOONLIGHT and HUMIDITY. The common arguments include *jua* 'sun', and *mwezi* 'moon' which are related to the darkness, daylight, and moonlight. The predicate *waka* 'shine' is paramount in describing either of the weather events. The weather nouns for humidity combine with the predicate *anguka* 'fall' or *tanda* 'spread out'.

The dichotomy of weather events can no longer hold for Kiswahili grammar. There are some weather events which do not get categorised in either dynamic events or static events. Table 1 captures meteorological events which are problematic to classify. Some examples for dynamic and static events are also provided. Furthermore, the interpretations of the static weather events are achieved through the use of the copulatives. The existential *there* is the primary outcome of the copulative constructions in Kiswahili.

The expletive constructions suggested elsewhere is not achieved in Kiswahili.

Two kinds of unaccusative weather verbs are identified in Kiswahili. On the one hand, there are verbs which reveal the combination of the features of unaccusative and unergative verbs, vis-à-vis *angaza* 'shine', *anguka* 'fall', *nguruma* 'rumble, roar', *rindima* 'rumble, roar', *tanda* 'spread out', *vuma* 'blow' and *waka* 'shine'. On the other hand, there are verbs which are typically unaccusative, namely *dondoka* 'drip, fall' and *nyesha* 'rain'.

The implications of the analyses in this paper emerge on the unaccusative hypothesis. The cognate objects in Kiswahili permit the intransitive weather verbs to open the structure V ____ NP, which is not regular in Kiswahili (Vitale, 1982) as well as in other Bantu languages (see Andrason & Visser, 2017). This also bears implications to the analysis of the properties of cognate objects of predicates for meteorological events even in English (Levin & Krejci, 2019).

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