

Morphosyntactic Analysis of Selected Scientific Reports on COVID-19 Pandemic by Nigeria Centre for Disease Control (NCDC)

Dauda, Ahmadu Mohammed, Jawur, James Jafaru & Salisu, Amina

Abstract

This study examines and analyses selected scientific report on COVID-19 pandemic by NCDC from a morpho-syntactic perspective. The report was downloaded online from the internet. The study is limited to 2021 reports from NCDC which were purposively selected for data. The analysis was both quantitative and qualitative, using Aronoff's Word Based Approach and Beard's Item and Arrangement Model. The words are identified, categorized and analysed based on their morphological forms, syntactic functions, morpho-syntactic types, and syntactic compositions. The analysis shows that most of the words are nouns/nominals. Such nominals name certain scientific concepts/processes/conditions. Elaborations of such morphemes are made in the rest of their syntactic contexts and in emphatic repetitions/recurrence of such morphemes. Such syntactic contexts are mostly of non-technical or conventional language. The syntactic aspect of the data facilitates the overall semantic role of the morphemes in two main ways: (i) connecting each morpheme to the rest of its syntactic context, and (ii) connecting the internal components of compound words [both roots/stems and affixes] with each other. It has been observed that a morpheme is morphologically and lexically categorized as a morpheme/word, but its internal composition may also show it as a GROUP. Also, such compound morphemes contain certain semantic components that could be syntactically deciphered as clauses or sentences. Such compounds enable scientific reports to capture lengthy or many messages in brief forms.

Introduction

Language is a medium of communication through which we express our feelings and emotions for communicative purpose. Chomsky (1965) stated that all languages claim common primary features. However, Finch (2000) asserts that languages like English deal with word order. Linguistically, morphology refers to the study of word formation, including the ways new words are coined in the language, and the way forms of words are varied depending on how they are used in sentences" (Lieber, 2009).

Fromkin et al. (2014) state that the part of grammar that represents a speaker's knowledge of sentences and their structures is called syntax. From this opinion, it can be observed that the main study of syntax also includes how a person explains his mind using sentences. Syntax also has several important roles in understanding

sentence structure or in other words how the language is arranged and the meaning in it.

During the outbreak of COVID-19, new expressions were invented. Immediately when the virus was discovered, scientists went ahead to investigate the sources of the virus and determine how to prevent it from being a pandemic in the world; these investigations and efforts were reported through the use of language. That is to show how vital language is in science.

According to NCDC (2019), the first case of coronavirus disease was confirmed in Nigeria, on the 27th February, 2020. The case was confirmed by the Federal Ministry of Health (FMH) in Lagos Nigeria. According to the Ministry, the case was brought to Nigeria by an Italian citizen who worked in Nigeria and returned from Milan, Italy to Lagos on 25th of February 2020. The victim was tested and confirmed positive by virology laboratory of the Lagos University Teaching Hospital, The Federal Ministry of Health (FMH) in collaboration with Nigeria Centre for Disease Control (NCDC) and the Multisectoral Coronavirus Preparedness Team (MCPT) led by NCDC activated its national emergency operations centre to respond to this case and implement strong control measures. NCDC urged all Nigerians to be conscious enough of their health and maintain respiratory hygiene to protect people and this paper focuses on the English morpho-syntactic aspect of the report.

Literature Review

A number of studies have been carried out on morphology and COVID-19 by different scholars using different approaches. This studies related works on literature. Different related works are reviewed below.

Weili (2001) investigates the morpho-syntactic interface in a Chinese phrase structure grammar. The aim of the research is to reveal the issues of morpho-syntactic interface especially those issues of natural language processing (NLP) disambiguity in Chinese's word identification, Chinese productive word formation and borderline phenomena between morphology and syntax.

The researcher also reveals the alternate use of separate verb forms, tenses and the use of affixation in Chinese language and most importantly the phrase structure grammar. Finally this research is aimed at “providing secured approach to solving problems at the interface of chinese morphology and syntax”.

Akut (2020) in a research on morphological analysis of the neologism during the COVID-19 pandemic seeks to reveal the neologism that exist during the coronavirus pandemic, Based on this research, it becomes obvious that there were many neologism that emerged during COVID-19 pandemic. It also revises the general morphemic structure of English vocabulary. There are neologisms found during COVID-19 pandemic and most of the neologisms are nouns and the common

morphological process are affixation that is, prefixes, suffixes and circumfixation, blending and compounding also play a vital role in COVID-19 pandemic. The work is limited to five (5) internet articles and the articles were published in the early first three (3) months of 2020 March, April and May. The descriptive qualitative and design approach is used in analyzing the morphological structures of COVID-19 neologism. Based on the findings free and bound morphemes are predominantly found in compound structure. Therefore in conclusion covid-19 pandemic reveals some neologism in English vocabulary.

Budiharto (2014) carried out a research on how academic writing can be carried in a morpho-syntactic point of view. The major focus is to enlighten students on writing skills and how to acquire general knowledge of academic writing and understand the forms and syntactic ability or knowledge on how to construct correct sentences. Furthermore, the researcher analyses the sentence types found in the data. Data were randomly selected from theses. The researcher finds out that complex sentences were predominantly used in Madura students' thesis proposal such as the use of adverbial, adjectival and noun clauses thus in the students' proposals, the researcher finds out two major errors in their sentences, subject and verb agreement. The Madura students found it difficult to construct complex sentence between Madurese languages and English due to the different word-order in their sentences.

All the works reviewed above are more or less related to this study, because they showed similarity in terms of morphological processes and forms. This study is mainly concerned with the morphological perspective on COVID-19 terminologies. However, it differs in terms of theory, selection of data and objectives. This brings the need to investigate the morphological terminologies that amount to scientific/technical term of each report.

Theoretical Framework

Morphological processes have two approaches: Item-And- Arrangement (in which both roots and affixes are treated as morphemes), or Item-And-Process (in which roots are morphemes, but affixes are treated as rules) (Hockett 1954, Di Sciullo and Williams 1987, Halle and Marantz 1993 and Maxwell, 1991, 1994 and 1998). The theoretical framework adopted for this research is a combination of Aranoff's (1976) Word Based Approach to word formation rules and Beard's (1995) Item and Arrangement Model. The Word-Based Approach can cover all linguistic perspectives. It is basically suitable for illustrating the genuineness of morphemes that make up a word and it offers the best clarification for the description of word and gives more convincing details for linguistic experience associated with the process types than other approaches, particularly the Item and Arrangement Model (IA). (Beard 1995).

Methodology

This study adopts purposive random sampling to collect the data from the internet. There were a number of domestic and foreign health agencies reporting the COVID-19 pandemic in 2021. One foremost among them was selected as source: the NCDC (domestic). From the report, one was randomly selected for data. This source was accessed via the internet. The data are presented according to the most commonly used words found in the report. The presentation and analysis of data are done simultaneously.

The data obtained are presented and analyzed morpho-syntactically. The morphological processes and forms are found in the data analyzed. The data are categorized into their process types. The morphemes identified in the data are analyzed into process types, process analysis and morphological forms. This research uses a quantitative and descriptive qualitative methods of analysis. The descriptive data in the form of written words is observed. The process enables us to relate ideas, perceptions, opinions that cannot be measured by numbers but are represented in words.

Data Analysis

The data are simultaneously presented and analyzed. The presentation and analyses are divided into four columns, Table 1 captures the morphological analysis of the data.

Table 1: Morphological analysis of 2021 NCDC COVID-19 situation report

	Morpheme	Process analysis	Process type
1.	cases	case + s	affixation
2.	encouraged	en + courage + d	affixation
3.	deaths	death + s	affixation
4.	confirmed	confirm + ed	affixation
5.	operations	operate + ion + s	affixation
6.	decreased	decrease + d	affixation
7.	reported	report + ed	affixation
8.	states	state + s	affixation
9.	patients	patient + s	affixation
10.	increased	increase + d	affixation
11.	cumulatively	cumulative + ly	acronymy/ clipping/ compounding
12.	fatality	fatal + i + ty	affixation

	Morpheme	Process analysis	Process type
13.	travelers	travel + er + s	affixation
14.	compared	compare + d	affixation
15.	globally	glo + bal + ly	affixation
16.	resulting	result + ing	affixation
17.	supported	support + ed	affixation
18.	monthly	month + ly	affixation
19.	samples	sample + s	affixation
20.	tested	test + ed	affixation
21.	active	act + ive	affixation
22.	erroneously	erroneous + ly	affixation
23.	COVID-19	corona + virus + disease + 2019	acronymy/ clipping/ compounding
24.	following	follow + ing	affixation
25.	educator	educator + s	affixation
26.	carried	carr + ied	affixation
27.	tests	test + s	affixation
28.	returning	return + ing	affixation
29.	samples	sample + s	affixation
30.	doctors	doctor + s	affixation
31.	centers	center + s	affixation
32.	communication	communicat + ion	affixation
33.	information	inform + a + tion	affixation
34.	opinions	opinion + s	affixation
35.	experts	expert + s	affixation
36.	officials	official + s	affixation
37.	confirmed fatalities	confirm + ed + fatal + ity + es	compounding/ affixation
38.	survival	surviv + al	affixation
39.	conducted	conduct + ed	affixation
40.	nigerians	nigeria + n + s	affixation
41.	informed	inform + ed	affixation
42.	decisions	decision + s	affixation

	Morpheme	Process analysis	Process type
43.	COVID-19	corona + virus + disease + 2019	acronymy/ clipping/ compounding
44.	protecting	protect + ing	affixation
45.	themselves	them + selves	affixation
46.	others	other + s	affixation
47.	continued	continue + d	affixation
48.	working	work + ing	affixation
49.	given	give + n	affixation
50.	rapidly	rapid + ly	affixation
51.	evolving	evolv + ing	affixation
52.	production	product +ion	affixation
53.	training	train + ing	affixation
54.	devastating	devastat + ing	affixation
55.	impacts	impact + s	affixation
56.	NCDC	Nigeria + Centre + For + Disease + Control	acronymy/compounding
57.	lives	live + s	affixation
58.	livelihood	live + li + hood	affixation
59.	currently	current + ly	affixation
60.	trainers	train + er + s	affixation
61.	experiencing	experience + ing	affixation
62.	NCDC	Nigeria + Centre + For + Disease + Control	acronymy
63.	highlights	high + light + s	compounding/affixation
66 to 96	commenced	commence + d	affixation

It can be seen in the table above that the process types found in this report are: affixation, acronym, acronymy/affixation, compounding/affixation and acronymy/ clipping/compounding. The most occurring process is "AFFIXATION". It can be noticed that most of the morphemes used in the report are acronyms. The reason is that, all medical professionals used a wide range of acronyms in their write up. This makes it difficult and sometimes impossible for non-medical personnel to be able to comprehend the contents of their write up.

From the table above, what is notable is that affixations are predominantly

made up of suffixes rather than prefixes. This can be observed by looking at the morphemes used in the report. The most frequent suffixes used in the report are: {ion}, {s} and {ed}. The predominant suffixes are not used in the report accidentally rather are used as a *noun, nominal or head of a nominal group* in order to donate the scientific terms used in the report, such as:

- i. {ion} = confirmation, investigation, information, situation and infection
- ii. {s} = deaths, cases, patients organizations and concerns
- iii. {ed} = immunity-related, population-based and published

The language of the report is morphologically and syntactically complex, because looking at the analysis above one can deduce that there are complex process types and syntactic functions. For instance, the complex process type that occurred frequently in the report are ACRONYMY + CLIPPING + COMPOUNDING + AFFIXATION, this occurred six times in the report. Another complex structure is ACRONYMY + CLIPPING + BLENDING COMPOUNDING + AFFIXATION occurred two times in the report which function as the *subject of the predicator* “has been monitoring” and “explores” in analysis above. However, despite the complexity of the report, morphology was able to illustrate and analyse the wording system which explicitly exposed the terminologies of language of science linguistically.

Morphologically, most of the process types found in the table above are affixation, such process types are used as names of certain scientific concept in the report.

Internal morphological composition of the morphemes

This table below highlights the morphological forms and compositions of all the morphemes presented in tables 1, the first column of this table indicates the number of each morpheme. For instance, data number 1.1.5 here corresponds to the morpheme ‘WHO’. Same system of correspondence applies to the other data numbers.

Table 2: Internal Morphological composition of the morphemes

Data number	Morphological form
1.1.1	root + suffix
1.1.2	prefix + root + suffix
1.1.3	root + suffix
1.1.4	root + suffix
1.1.5	root + suffix + suffix

Data number	Morphological form
1.1.6	root + suffix
1.1.7	root + suffix
1.1.8	root + suffix
1.1.9	root + suffix
1.1.10	root + suffix
1.1.11	root + suffix
1.1.12	root + suffix + suffix
1.1.13	root + suffix + suffix
1.1.14	root + suffix
1.1.15	root + suffix + suffix
1.1.16	root + suffix
1.1.17	root + suffix
1.1.18	root + suffix
1.1.19	root + suffix
1.1.20	root + suffix
1.1.21	root + suffix
1.1.22	root + suffix
1.1.23	root + root + root + root
1.1.24	root + suffix
1.1.25	root + suffix
1.1.26	root + suffix
1.1.27	root + suffix
1.1.28	root + suffix
1.1.29	root + suffix
1.1.30	root + suffix
1.1.31	root + suffix
1.1.32	root + suffix
1.1.33	root + suffix + suffix
1.1.34	root + suffix
1.1.35	root + suffix
1.1.36	root + suffix
1.1.37	root + suffix + root + suffix + suffix

Data number	Morphological form
1.1.38	root + suffix
1.1.39	root + suffix
1.1.40	root + suffix + suffix
1.1.41	root + suffix
1.1.42	root + suffix
1.1.43	root + suffix
1.1.44	root + suffix
1.1.45	root + suffix
1.1.46	root + suffix
1.1.47	root + suffix
1.1.48	root + suffix
1.1.49	root + suffix
1.1.50	root + suffix
1.1.51	root + suffix
1.1.52	root + suffix
1.1.53	root + suffix
1.1.54	root + suffix
1.1.55	root + suffix
1.1.56	root + root + root + root + root
1.1.57	root + suffix
1.1.58	root + suffix + suffix
1.1.59	root + suffix
1.1.60	root + suffix
1.1.61	root + suffix
1.1.62	root + suffix
1.1.63	root + root + suffix
1.1.64	root + suffix
1.1.65	root + suffix
1.1.66 to 1.1.96	root + suffix

Computation of results

The analysis of the data presented above has revealed interesting symmetry of morphological types, their occurrences and overall impact on the COVID-19 reports. The study has captured and analyzed 96 morphemes that constitute the “landmarks” of these reports.

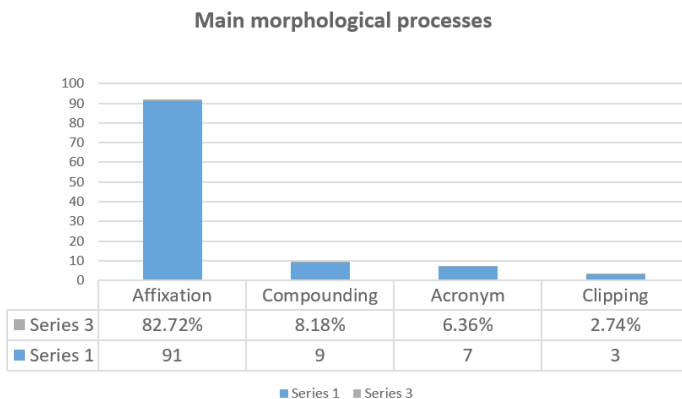
Table 3: Frequency of occurrences of the morphemes found in the data

Data	Frequency	Percentage
1	96	100%

The table above shows the number of morphemes found in the data.

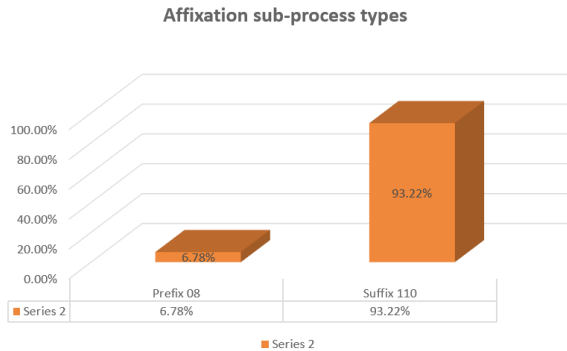
Those 96 salient morphemes subsume 110 main morphological processes and 118 sub-processes, as outlined below:

Table 4: Frequency of occurrences of the main morphological processes



The table above shows the frequency of occurrences of the Main morphological processes in the Data, of the total of one hundred and five (110) morphemes, affixation had ninety one (91), equivalent to eighty two point seven percent (82.72%), compounding had nine (09), equivalent to eight point eighteen percent (8.18%), acronymy had seven (07), equivalent to six point thirty six percent (6.36%), finally, Clipping had three (03), equivalent to two point seventy four percent (2.74%).

Table 5: Frequency of occurrences of affixation sub process types



The table above shows the frequency of occurrences of the sub processes of the Main process (affixation) in the Data, of the total one hundred and eighteen (118) sub processes, prefix had eight (08), equivalent to six point seventy eight percent (6.78%) and suffix had one hundred and ten (110), equivalent to ninety three per cent twenty two (93.22%).

Table 6: Frequency of occurrences of internal morphological forms

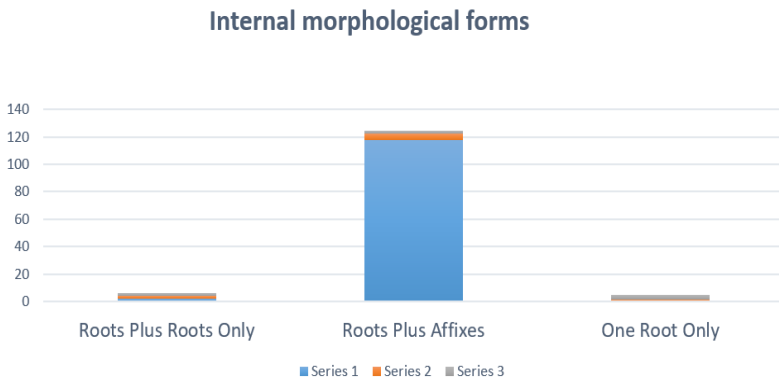


Table shows the frequency of occurrences of internal morphological forms found in the Data, of the total of one hundred and twenty (120) forms, roots plus roots only had two (02), equivalent to one point sixty seven percent (6.67%), roots plus

affixes had one hundred and eighteen (118), equivalent to ninety eight point thirty three percent (98.33%), finally, one roost only had zero (00), equivalent to zero point zero percent (0.00%).

Interplay of Morphology and Syntax in the Report

The interplay of Morphology and Syntax in morphemes has been extensively exhibited in most of the data analyzed in this chapter. For instance, as observed above, a morpheme is morphologically and lexically categorized as a *morpheme/word*, but its internal composition may also show it as a *group*. Also, such compound or acronymic morphemes contain certain *semantic* components that could be syntactically deciphered as clauses or sentences. For example:

COVID-19: A coronavirus disease that broke out in 2019; A viral disease that is of the Corona type discovered in 2019.

Such acronymic compounds enable scientific reports to capture lengthy or many messages in brief forms. Hence, compounds and acronyms are predominantly used in the report.

Another feature of such an interplay can be seen in dominant use of affixes especially (suffixes) to form nouns/nominals that name certain medical processes or conditions. Such nominal tend to imply certain verbal actions or states without stating the verbal agent. For instance:

- i. Infection - someone/something *infects/infected*
- ii. Transmission - someone/something *transmits/transmitted*.
- iii. Management - someone *manages/managed*.

This nominalizing technique via suffixation makes the reports more objective (Kueffer and Larson, 2014) by omitting the subjectivity that may otherwise be read in a stated agent of a verb.

According to syntactic category, of all the morphemes analyzed, comprise only one noun/nominal (N) each, consists of more than one noun/nominal each, and have no noun/nominal in their individual compositions. Thus, the syntactic categories of all the morphemes analyzed are dominantly nominal.

Of all the syntactic functions of the morphemes realized morphemes functioning as heads of nominal groups are, then the functions of object of preposition are, modifiers of nominal heads are, subjects of predicators/sentences are, complements of predicators are, predicators are, and qualifiers of nominal heads are also. Therefore, even in syntactic functions, nominal functions are the dominant ones.

Morphological Landmarks in the Reports

In this paper we analyzed and discussed the NCDC COVID-19 reports. From what had been analyzed in the report. We found out that the report is medical based report, written by medical professionals in their various fields. It is noted that the language used in the report is a unified organized medium of communication and expression of medical terminologies which manifest a higher level of consistency in their use of medical language. Most of the scientists are known for illegibility of their writing. This makes it difficult and sometimes impossible for non-medical personnel to be able to comprehend the contents of their write up. The medical terminologies used in the reports can only be understood by the context of the profession.

Compounding/compound words

The first process is compounding whereby two or more roots or free morphemes are combined to produce a new word. It can be seen from the table that there are new words formed by combining two or three free morphemes into one terminology. For example, Sample Collection Centers (SCC), it is a center which was established during the first and second waves of the global pandemic to provide swift oxygen therapy to residents who require it and easy access to COVID testing for citizens who needed to test for COVID infection. Structurally, it is an example of a compound consisting of a complex stem. During the COVID-19 pandemic, the term SCC (Sample Collection Centers) underwent some form of semantic shift and has been used in the traditional sense of the word as explained above. The term Sample Collection Centers has therefore become a common vocabulary used in day-to-day conversations.

Blending

Blending is a process where two words are brought together to create a new word which combines their meanings. However, in blending, only parts of the words are used usually after undergoing some processes. Blending can be created through the creation of the beginning of one word can be combined with the end of another word for example. Certain words in the reports have been created using this strategy. For instance, the term COVID -19 itself is a blending derived from Corona Disease -2019, giving us a completely new term or word. The term COVID-19 combines the first two letters of three different words and then adds a numeral and uses a hyphen as a linking element. Other examples of blended terms after COVID include: *infodemic* is a blend word of “information” and “epidemic.” The term *infodemic* refers to the speedy and extensive spread of correct and incorrect information about something, such as a disease to the extent that its clarification

is made more difficult. It also involves the fast spread of misinformation. According to the etymological theory, infodemic is an example of a word already exist in a language but has developed a new meaning recently; in this case, it is motivated by the pandemic. In this period of COVID-19, there has been an overload of information about the pandemic. Some are true and some are false. Making it impossible to distinguish between facts and fiction about the pandemic. Information overload has several effects on people. It can slow down people's productivity and their ability to make timely decisions.

Acronymy and abbreviation

An acronym is a word or an abbreviation that formed from the first letters of different words and pronounced as a word on its own right. Examples of acronyms are: WHO which stand for World Health Organization and NCDC Nigeria Center for Disease Control. The two acronyms are used to denote an agency or organization associated with COVID-19 reports used for this study. Another example of an acronym associated with COVID-19 are SARS-COV-2, (Severe Acute Respiratory Syndrome Corona Virus-2), PHSM (Public Health Social Measures), VOCs (Variants Of Concerns), SHEs (State Health Educators) among others. The term SARS-COV-2, (Severe Acute Respiratory Syndrome Corona Virus-2) is a highly transmissible and pathogenic coronavirus that emerged in late 2019 which occur through direct, indirect, or close contact with infected people through infected secretions such as saliva and respiratory secretions or their respiratory droplets, which are expelled when an infected person coughs, sneezes or talks.

Affixation

Affixation is another morphological process utilized during COVID-19 pandemic. Morphologically, there are five main process types and only two sub processes found in this work as can be seen above. Affixation is a morphological process whereby an affix is attached to a base or root word to form a new word. Sometimes the new word takes on a whole new meaning, and sometimes it simply gives us more grammatical information. Affix is a type of bound morpheme, this means they cannot stand alone and most appear alongside a base word to get their meaning. For example, *preparedness, deaths, cases, hand gloves, plain face marks, infection, workers, published, management, reinfection, antibodies and WHO's* among others.

Suffixes used for creation words in English are mostly of Latin and Greek origin. In the analysis above COVID-19, derived words formed by affixation are less numerous. The majority of these words which appeared during coronavirus are formed by the application of suffixes to bases related to coronavirus, while we found only

two circumfixes that are used in this word formation process, reinflection and antibodies.

Syntactic Functions of Internal Morphemes

The analysis was conducted on 4 reports to investigate the frequency of occurrences and descriptions of their syntactic structures and to study in more profound detail of their syntactic patterns, forms and functions. It can be seen that the majority of the syntactic functions found are in the form of Nominal Heads followed by Prepositional Object. Since Nominal Heads outnumber other syntactic patterns in the reports, we may be able to conclude that they are the most predominant linguistic choice for the purpose of turning the language of the reports into scientific ones. Nominal Heads used in the reports simply engage the readers with a lot of information from strings of words. It is not surprising then that Nominal Heads are mainly used in order to represent a big concept within a concise space of COVID-19 reports. They are intended to make an impact on the message of the reports. In terms of the syntactic forms of Nominal Heads, the majority of the Nominal Heads consist of Roots plus Affixes. It is found that most of the Roots plus Affixes are the names of the organizations, place or list of items for example, WHO, NCDC, MDAs (ministry, department, agency) SCC (sample collection centers), eyeglasses, plain facemasks among others. This is probably to make the reports easy to remember.

Moreover, the study reveals that a range of degree of adjectives are used as modifiers to the Nominal Group. The use of such adjectives certainly aims at creating a more interesting, more engaging information of the country and at the world at large. There are two noun phrases that employ a linguistic tactic to make the reports more attractive to catch readers' attention. These nouns are COVID-19 and SARS-CoV-2. However, they are used to stress the thematic line and beauty of the reports which makes the reports more interesting and known to readers.

The analysis pinpoints that the syntactic structure with highest number of occurrences is the one with more than one root are used more often than the other types of structures. Basically, more than one roots are used to fulfill an informative function. According to this, it could be considered that More Than One Root in COVID-19 reports are used to give complete information to the audience and invite them to accept the given information. Its hope that this structure should be an appropriate choice for those who have to come up with attractive report.

Conclusion

The morphosyntactic investigation of the reports covering the COVID-19 pandemic revealed that the newly created terms are content words, namely nouns and nominals. These neologisms provide specific terms to refer to the actions or experiences of the people during the COVID-19 pandemic. Moreover, the common morpholog-

ical processes involved in the creation of these lexical items include compounding, acronyms, blending and affixation. These processes manifest the change of a language as new words are added into the vocabulary through various methods. From the results of the analysis, the dominant morphological process has been revealed as Affixation, then Acronymy. Nominal syntactic functions have also been highlighted as the dominant syntactic function of all the syntactic functions, with nominal head taking the lead with Such nominals are shown to be naming key scientific processes or concepts or conditions. Such scientific “landmarks” in the reports are seen to have been partially elaborated by the rest of the syntactic contexts in which they occur. Overall, such complex morphemes are shown to have been deliberately formed and deployed in scientific reports as these ones under study in order to capture lengthy messages in brief forms.

REFERENCES

- Akut K. B. (2020). “Morphological Analysis of the Neologism During COVID-19”: Bukidnon State University, Malaybalay City, Buladnon Philippines.
- Aronoff, M. (1976). *Word Formation in Generative Grammar: Linguistic Inquiry Monograph One*. Cambridge, MA: MIT Press
- Aronoff M. and K. Fudeman (2011). *What is Morphology?* 2nd Edition. UK: Blackwell
- Beard, R. (1995) *Lexeme-Morpheme Base Morphology*. Albany: State University of New York Press.
- Booij, G. (2010) *Construction morphology*. Oxford University Press.
- Booij, G. (2012) *The Grammar of Words. An introduction to Morphology*. 3rd edn. OUP.
- Booij, G. and R. Lieber (2004) On the Paradigmatic Nature of Affixal Semantics in English. *Linguistics* 42: 327-357.
- Budiharto, R. A. (2014), A morphosyntactic analysis on the university students’ thesis proposal in Madura. 3rd UAD International Conference, Ahmad Dahlan. Amsterdam / Philadelphia: John Benjamins Publishing Co.
- Chomsky, N. (1957). *Syntactic Structures*. The Hague/Paris: Mouton
- Chomsky, N.. (1965). *Aspects of the Theory of Syntax*. Massachusetts: M.I.T. Press
- Di Sciullo, Anna-Maria and Williams, E (1987). *On the Definition of Word*. MIT Press.
- Fromkin et al. (2014). *An Introduction to Language*. Michael Rosenberg.
- Halliday, M.A.K. and Matthiessen, C.M.I.M. 2004. *An Introduction to Functional Grammar*. London: Arnold
- Halliday, M.A.K. (1970). *Language Structure and Language Function*. Lyons, J. (ed) (1970). New Horizons in Linguistics. London.

- Halle, M. and Marantz, A. (1993). "Distributed Morphology and the Pieces of Inflection." *The view from building 20*, edited Kenneth Hale and Sylvian Bromberger. Cambridge, MA: MIT Press. 111-176
- Hockett, C. (1954). "Two Models of Grammatical Description." *Word* 10: 210-231. Reprinted in Jos (1957), Pages 386-399
- Khwaileh, T. et, al. (2015). Morphosyntactic Processing of Arabic Plurals in Aphasia: Dissecting Lexical Meaning from Morphosyntax within Word Boundaries. *White Rose Research Online*, The University of Sheffield.
- Lieber, R. and P. Stekauer (2009) *The Oxford Handbook of Compounding*. Oxford: Oxford University Press.
- Maxwell, M, (1991). "Phonological Analysis and Opaque Rule Orders." Proceedings of the Second International Workshop on Parsing Technologies. Pittsburgh: SIGPARSE Group of the Association for Computational Linguistics.
- Maxwell, M, (1994). "Parsing Using Linearly Ordered Phonological Rules." *Computational Phonology: First Meeting of the ACL Special Interest Group in Computational Phonology*. Somerset, NJ: Association for Computational Linguistics.
- Maxwell, M, (1998). "Two Theories of Morphology, One Implementation." *SIL Electronic Working Papers*, Summer Institute of Linguistics, Inc
- Peter L. (1965) *Communication in Business*. Longmans.
- Plag, I. (2003). *Word Formation in English*. Cambridge University Press
- Quirk, R and Green B, S. (1973). *The Grammar of English*. Hong Kong: Longman.
- Quirk, R., Sidney Greenbaum, Geoffrey Leech and Jan Svartvik (1985). *A Comprehensive Grammar of English*. London: Longman.
- Weili Y. (2021). *The Morpho-syntactic Interface in a Chinese Phrase Structure*. Dept. of Linguistics, School of Chinese Academy of Social Science, China. Canada: National Library of Canada
- World Health Organization. Coronavirus Disease 2019 (COVID-19) Situation Report. <https://www.who.int/docs/default-source/coronaviruse/situation-reports/2...> (2020)
- Zhang YZ, Holmes EC. A Genomic Perspective on the Origin and Emergence of SARS-CoV-2. *Cell*. 2020;181 :223-227. – PMC - PubMed