



An Analysis of the Word Formation Processes in “Captain Marvel” Movie

Sarah Kamagi¹(✉), Cynthia Maria Siwi², and Christina Devita Rantung¹

- ¹ Prodi Bahasa dan Sastra Inggris, Universitas Negeri Manado, Tondano, Indonesia
sarahkamagi@unima.ac.id
- ² Prodi Ilmu Administrasi Negera, Universitas Terbuka Manado, Manado, Indonesia

Abstract. This research aims at analyzing the word formation processes used in “Captain Marvel” Movie. It was conducted not only to identify the types of word formation but also to reveal the processes of word formation occurred in “Captain Marvel” movie. In conducting the research used qualitative method combine to quantitative one, where data are collected through watching the movie and reading the script. The technique of analysing data following the procedures proposed by Miles and Huberman data reduction, data display and drawing conclusion, while in analysing the word formation processes, used Morphological analysis by George Yule. The result showed that there were sixty-four data included in six types of word formation processes. There were nine data in Borrowing, thirty-eight data in Compounding, five data in Clipping, two data in Conversions, three data in Acronym, and five data in Derivation. Compounding Process was dominantly used in the “Captain Marvel” movie which found thirty-eight data.

Keywords: Morphological analysis · Word Formation Process · Captain Marvel movie

1 Introduction

Humans cannot be divorced from language since they utilize it to communicate in every scenario and environment [1]–[3]. According to references language is often considered as a vehicle for thinking, a system of communication that facilitates the transmission of idea from one individual to another. Thus, language has become an essential instrument for communicating ideas, views, emotions, and facts with others. Typically, communication occurs in a community, in which each community member or society may discuss anything or develop a relationship with one another. Morphology is the field of linguistics that investigates the fundamental structure of words. Morphology is the examination of the underlying structure of words according to citation [4]–[6]. Therefore, morphology involves not only the study of the fundamental shape of words, but also their interior structure. According to [6]–[8], “Morphology refers to the brain mechanism involved in word development or the area of linguistics that studies words, their inner structure, and how they are generated.”

2 Research Methodology

2.1 Research Design

Since the purpose of the study is to identify and describe type of word formation found in the movie entitled Captain Marvel, this study is categorized as a content analysis. Furthermore, the data collected were quantified, therefore, the study is classified as quantitative content analysis [9, 10]. This study falls into the category of quantitative content analysis because it deals with type and proportion of each type of word formation.

2.2 Data Collection

The data was collected by the researcher as first, the researcher watched the movie and listened to the conversation carefully. Second, read the script of the movie from transcripts.fandom.com available at [https://transcripts.fandom.com/wiki/Captain_Marvel_\(2019\)](https://transcripts.fandom.com/wiki/Captain_Marvel_(2019)). Third, identify the word formation by giving a mark using color markers.

2.3 Data Analysis

Two questions arose from the study that needed to be addressed. The first one is, using George Yule's theory, what different kinds of word-forming processes are present in the film "Captain Marvel?" To get the answer, we tallied the frequency with which different sorts of words were formed. This led to a percentage-based quantitative analysis of the data. The following equation was used in the analysis:

$$\frac{\text{Each type of word formation}}{\text{Total Word formation}} = x \times 100\%$$

3 Findings and Discussion

The source of data in this study is the movie 'Captain Marvel'. The film was first transcribed and the word formations in the transcription were identified and collected afterward. The data collected are presented in Fig. 1.

Having collected the data, the data were then classified based on the types of word formation found in the story. It should be noted that there were 144 word formations identified. These data were then classified into 6 types of word formations, namely derivation, compounding, borrowing, clipping, conversion, and acronym. The proportion of each type is depicted in Fig. 2.

As shown in Fig. 2, word formation in the novel was dominated by derivation with 87 data 60.4%, followed by compounding with 38 or 26.4% in the second position, borrowing in the third position with 9 data or 6.3%, in the fourth, clipping with 5 data or 3.5% in the fifth, acronym with 3 data or 2.1%, and conversion with 2 data or 1.4%. Thus, derivation is or the most dominant type, followed successively by compounding, borrowing, clipping, acronym and conversion. The following is the explanation of each type. (147).

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Borrowing	Description
Pegasus	Pegasus (or Pegasos) is a flying horse from Greek mythology. He was born from the neck of something like the Gorgon Medusa, who was killed by Perseus. Pegasus was fathered by Poseidon. In Greek mythology, there is only one horse named Pegasus that can fly. The Greek term pegai, from which we get the English word “springs” or “water;” is whence we get the name “Pegasus.”.
Déjà vu	Déjà vu means feeling of having previously experienced a present situation. This word is from French <i>Déjà vu</i> which born in 1903 literally “already seen”. The phenomenon also known as ‘promnesia’.
Cuckoo	The name cuckoo was borrowed into English about the 13th century from its French origin, coucou. Both phrases sound like the distinctive male’s cry when he first arrives in Europe in the spring from Africa.
Halloween	Etymologically, <i>Halloween</i> or <i>Hallow-e’en</i> , <i>Hallow e’en</i> , also known as <i>Allhalloween/All Hallows’ Eve</i> or <i>All Saints’ Eve</i> , 1745 come from Scottish, which means “Saints’ evening”. The <i>Halloween</i> word that was originated with the ancient Celtic festival of Samhain,
Ketchup	In 1692, a sauce named “Ke-stiap” was described as a mixture of cured meats and spices in China; one hundred years later in the West, vegetables were introduced to the sauce, turning it into the wildly popular condiment known simply as “ketchup.”
Venus	Venus means “love, sexual desire, loveliness, attractiveness, charm, or an item that is adored” in Latin, and Venus was the queen of beauty and love in ancient Roman mythology.
Tesseract	Tesseract means four-dimensional (cube) which come from Greek. <i>Tesseract</i> classified as a borrowing word.
Hellion	Etymologically, the word <i>hellion</i> of aphelion and perihelion is based on the Greek word ‘hēlios’ which means ‘sun’.

3.2 Compounding (38)

There are thirty-eight data were categorized as compounding word.

Compounding word	Description
Anything	The word <i>anything</i> is a compound word, from any (Adj) and thing (N), which refers to a thing, no matter what’.
Without	The word <i>without</i> is a compound word, from <i>with</i> (Prep), and <i>out</i> (Adv), which means ‘in the absence of’.
Inside	The word <i>inside</i> is a compound word, from in (Prep), and side (Adj) which means ‘the inner side or surface of something’.
Handsome	The word <i>spacship</i> is a compound word, from hand (N), and some (Adj) which means ‘a good-looking of a man’.

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Compounding word	Description
Stronghold	The word <i>stronghold</i> is a compound word, from strong (Adj), and hold (V) which means 'a place that has been fortified so as to protect it against attack'.
Throughout	The word <i>throughout</i> is a compound word, from through (adv), and out (Adv) which means 'in every part of a place or object'.
Takeoff	The word <i>takeoff</i> is a compound word, from take (V), and off (Adv) which means 'the action of becoming airborne'.
Airplane	The word <i>airplane</i> is a compound word, from air (N), and plane (N) which means 'a powered flying vehicle with fixed wings and a weight greater than that of the air it displaces'.
<i>Dogfight</i>	The word <i>dogfight</i> is a compound word, from dog (N), and fight (V) which means 'a close combat between military aircraft'. The word <i>dogfight</i> is from two different words that are joined and become a new word.
Somewhere	The word <i>somewhere</i> is a compound word, from some (Adj), and where (Adv) which means 'in or to some place'.
Lightspeed	The word <i>lightspeed</i> is a compound word, from light (N), and speed (N) which means 'the spacecraft travels at the speed of light'.
Shithole	The word <i>shithole</i> is a compound word, from shit (N), and hole (N) which means 'an extremely dirty, shabby or otherwise unpleasant place'.
Lifeform	The word <i>lifeform</i> is a compound word, from life (N), and form (N) which means 'any living thing'.
Motorcycle	The word <i>motorcycle</i> is a compound word, from motor (N), and cycle (N) which means 'a two-wheeled vehicle that is powered by a motor and has no pedals'.
Overtake	The word <i>overtake</i> is a compound word, from over (Adj), and take (V) which means 'catch up with and pass while travelling in the same direction'.
Airport	The word <i>airport</i> is a compound word, from air (N), and port (N) which means 'a complex of runways and buildings for the takeoff, landing and maintenance of civil aircraft, with facilities for passengers'.
Earthman	The word <i>earthman</i> is a compound word, from earth (N), and man (N) which means 'a human native or resident of the planet Earth'.
Overtake	The word <i>overtake</i> is a compound word, from over (Adj), and take (V) which means 'catch up with and pass while travelling in the same direction'.
Fingerprint	A fingerprint is "an imprint or mark formed on a surface by a person's fingertip particularly as used for people in history from the specific pattern of ridges and lines," according to the Oxford English Dictionary..

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Compounding word	Description
Paperclip	The word <i>paperclip</i> is a compound word, from paper (N), and clip (N) which means 'a piece of bent wire or plastic used for holding several sheets of paper together'.
Aircraft	The word <i>aircraft</i> is a compound word, from air (N), and craft (N) which means 'an airplane, helicopter or other machine capable of flight'.
Undercover	The word <i>undercover</i> is a compound word, from under (Adj), and cover (N) which means '(of a person or their activities) involved in or involving secret work within a community or organization especially for the purposes of police investigation or espionage'.
Jump-point	The word <i>jump-point</i> is a compound word, from jump (V), and point (N) which means 'the position from which the jumper falls or begins to fall'. The word <i>jump-point</i> is from two different words that joined and became a new word.
Stowaway	The word <i>stowaway</i> is a compound word, from stow (V), and away (Adj) which means 'a person who hide on a ship, aircraft or other vehicle'.
Shortcut	The word <i>shortcut</i> is a compound word, from short (Adj), and cut (V) which means 'a shorter alternative route'.
Overtime	Overtime is a hyphenated noun that indicates "time in excess to what is typical, like time worked beyond one's planned working hours." It comes from the words "over" (adjective) and "time" (noun).
<i>Ugly-ass</i>	The word <i>ugly-ass</i> is a compound word, from ugly (Adj), and ass (N) which means 'really hideous'..
Understand	The word <i>understand</i> is a compound word, from under (Adj), and stand (V) which means 'perceive the intended meaning of words, language or speaker'.
Spaceship	The word <i>spaceship</i> is a compound word, from space (N), ship (N) which means 'a spacecraft especially one controlled by a crew'.
Prolong	The word <i>prolong</i> is a compound word, from pro (N), long (Adj) which means 'extend the duration of'.
Anymore	The word <i>anymore</i> is a compound word, from any (Prep), more (Adj) which means 'to any further extent or any longer'.
Scramjet	The definition of a scramjet is "a ramjet in which combustion takes place in a stream of gas flowing at supersonic speed," and the name is derived from the prefix <i>scram</i> and the suffix <i>jet</i> (N).
Lunchbox	The noun <i>lunchbox</i> implies "a container in order to carry a packed meal," and it is derived from the two nouns <i>lunch</i> and <i>box</i> .
Pinball	Pinball is a made-up term that combines the nouns <i>pin</i> (a pointing device) and <i>ball</i> (a kind of ball) to describe a game in which players try to earn points by directing tiny metal balls toward a series of objectives on a slanted playing surface.

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Compounding word	Description
Arm-wrestle	The term “arm-wrestle” is a combination of the noun “arm” and the verb “wrestle,” and it describes a game in which two individuals hold hands while one of them rests their elbow on a table.
Dropship	The term “dropshipping,” a combination of the verb “drop” and the noun “ship,” refers to the practice of transporting items directly from a producer to a merchant, bypassing the traditional distribution network.
Postman	The word <i>postman</i> is a compound word, from post (N), and man (N), which means ‘a person who is employed to deliver or collect letters and parcels; a mail carrier’.
Goodbye	The word <i>goodbye</i> is a compound word, from good (Adj) and bye (N), which means ‘used to express good wishes when parting or at the end of a conversation’.

3.3 Clipping (5)

There are found five data categorized as clipping word.

Clipping	Description
Comms	The word <i>comms</i> is a clipped word of <i>communications</i> , which means ‘the imparting or exchanging of information or news’.
Tech	For technical, just use tech. Technical refers to someone who is well-versed in a certain field, such as an engineering or scientific consultant, or who specializes in that field. In the film, technology was employed to establish a connection between the scientist and her work on the light-speed code.
Doc	‘Doc’ is short for ‘doctor,’ which implies ‘a trained medical professional’ or ‘a physician’ in its full sense.
Lab	Meaning “a room or building fitted for scientific experimentation, research, or teaching, or for the synthesis of medications and chemicals,” Lab is derived from the term laboratory.
Heli	When referring to an aircraft that gets its lift and power from a series of horizontally rotating overhead rotors, the abbreviation “heli” is used. The last syllable of the word “copter” is removed in the clipping process.

3.4 Conversion (2)

There are found two data categorized as conversion word.

Conversion	Description
Fuel	The word <i>fuel</i> (N) is a material such as coal, gas, or oil that is burned to produce heat or power. But the word <i>fuel</i> here is a verb because the phrase in the dialogue is “with your past which <i>fuels</i> them”. Fuel used as a verb here means to supply or power something with fuel (N) and it calls the process of changing the function of a word without any reduction.
Fire	The word <i>fire</i> (N) is a combustion or burning in which substances combine chemically with oxygen from the air and typically give out bright light, heat, and smoke. But the word <i>fire</i> here is a verb (V) because the phrase in the dialogue is “Permission to <i>fire</i> ?” and the meaning of fire as a verb is to discharge a gun or other weapon in order to explosively propel (a bullet or projectile). The word <i>fire</i> here is changing the function of the word (from noun to verb) without any reduction is called conversion.

3.5 Acronym (3)

There are found five data categorized as acronym word.

Acronym	description
MIG	MIG is an acronym (initialization) from the word <i>Mikoyan I Mikhail Gurevich</i> . The ‘i’ in the middle of the word MIG is the Russian word which means ‘and’. Mikoyan & Gurevich are Russian aircraft designers. MIG is a Russian aerospace and defence company headquartered in Begovoy District.
ASIS	ASIS is an acronym (initialization) from the word <i>Aviation Safety Inspectors</i> . ASIS is a global community of security practitioners. It works to ensure the safety of aircrafts including its parts, processes and its aircraft operators. The <i>ASI</i> was the name of an aircraft that Geheneris HalaSon Mahr Vehl (Philip Lawson/Mar-Vell) designed.
Shield	SHIELD is an acronym (initialization) from the word <i>Strategic Homeland Intervention, Enforcement and Logistics Division</i> . SHIELD is an American extra-governmental military counter-terrorism and intelligence agency, tasked with maintaining both national and global security.

3.6 Derivation

The number of terms that were derived from another word was 86. The act of coining a new term is known as “derivation.” The new term, developed from the old one, is connected to the original in some way but has a different meaning and frequently belongs to a different category. To create a new term in English, it is usual practice to attach a root word morpheme to an existing word’s base. There are 85 terms in the data set that are derived from other words.

These derived words are clasified to word classes namely: noun, adjective and adverbs. These derived words were created by affixing a derivational morpheme to a base, particularly at the end of the base. The derivational morpheme that added at the end is called suffix.

3.7 Noun Formation

Suffixes	Derivational Data: Noun formation
Noun formation by adding –ion to the base	distraction expansion civilization caution elevation location explosion information identification congratulation infiltration communications description invasion questions investigation simulation operation deception impression conversation permission transfusion infestation modification precautions destination diversion
Noun formation by adding –ence / ance	Intelligence clearance
Noun formation by adding –ment	Equipment engagement judgment
Noun formation by adding –ity /- ety	Electricity identity security safety
Noun formation by adding –ness	Goodness likeness
Noun formation by adding –ship	spaceship
Noun formation by adding –ist, -or, -er	Terrorists communicator believer Killer accusors commander
Noun formation by adding -ure	Signature failure
Noun formation -th	strength

The data indicated that the above-mentioned nouns were formed by adding suffixes such as –ion, -ence/-ance, -ment, -ity/-ety, -ness, -ship, -ist, -or, -er, -ure, and –th. These suffixes are commonly used for noun formation in English.

3.8 Adjective Formation

AS noun formation, in English adjectives are formed following similar process in which affix is added to the end of a word or base, serving to form an adjectives.

Suffixes	Data Derivation: Adjective formation
Adjective formation by adding –ous to the base	<i>dangerousinsidious subconscious unconscious</i>
Adjective formation by adding -able	<i>fallible unstoppable</i>
Adjective formation by adding -ive	<i>attractive operative</i>
Adjective formation by adding -ful	<i>Beautiful wonderful shameful powerful</i>
Adjective formation by adding -ional	<i>delutional emotional personal universal testimonial signal</i>
Adjective formation by adding -y	funny
Adjective formation by adding -less	<i>helpless</i>
Adjective formation by adding -ent	<i>excellent</i>

The data just mentioned indicated that the adjectives in “Captain Marvel movie” were formed by adding suffixes such as –ous, –able, –ive, –full, –ional, –y, less, and –ent.

4 Discussion

The data mention in 4.1 indicated that there were 144 word formation data in Captain Marvel written script. These data consisted of six types of word formation, namely derivation, compounding, borrowing, clipping, conversion, and acronym. Of these six types of word formation, derivation was in the first position with 87 data, successively followed by compounding in the second position with 38 data, borrowing in the third with 9, clipping in the fourth with 5 data, acronym in the fifth with 3 data, and conversion in the last position with 2 data. Thus, derivation was the most dominant word-formation process found in the movie script.

Numerous research have focused on how words are created. According to [9], who studies autistic children in SLB Padang as active communicators using word creation processes, the most common method of word construction used by autistic children is derivation. Derivational terms for nouns were found to be the most popular choice for the headlines of the top ten educational articles published in the Jakarta Post [11]. According to Aulia Rahmi’s (2020) research on the English translation of the Holy Qur’an by Maulawi Sher ‘Ali, the most prominent method of composition in Surah Al-Qalam is derivation. Out of a total of 125 data, 39 were present. Our results show that derivation is the most common method of word generation in the literature we examined.

In his research work on the subject, [12]–[14] argued that “Vocabulary is not an aim in itself.” Having a large vocabulary makes it simpler to communicate effectively in listening, speaking, reading, and writing. Having a firm grasp on how words are constructed is crucial in this setting. There are a wide variety of processes that contribute to the construction of words and the development of their meanings, and educators would do well to familiarize themselves with them. When learning a new language, students often utilize compounding to create new meanings from existing terms (free morphemes). Waterfall, for instance, is constructed from the two free morphemes water and fall. Thus, educators may help students acquire a second language more effectively and rapidly by identifying the students’ existing vocabulary of single-syllable terms and instructing them on the proper use of morphemes to form compound words [13, 15, 16].

Teachers should first begin with familiar, easy terms before moving on to more complex ones and explaining the procedures for deriving meaning from them, because derivation is so central to written language. They must illustrate the connection between the derived terms and their base-level counterparts. The antonym of represent is misrepresent, and the term dependable describes someone who can be counted on. With this strategy, students of a foreign language may make up their own terms that they’ve never encountered before. Therefore, it’s important that teachers of foreign languages encourage students to use imaginative word choices.

5 Conclusion

The analysis of how new words are created in the film Captain Marvel reveals that many of them are derived from existing ones through the addition of affixes and suffixes,

or sometimes both. Actually, there are many characteristics of the derivation process, such as nouns being derived from verbs and adjectives from nouns, among many others; however, the writer found that among derivation words with three kinds of derivation process, 21 words included of adjective derivation, 48 words included of noun derivation, and 17 words included of adverb derivation. This study found that noun derivation was the most prevalent kind of derivation employed in the Captain Marvill film, followed by adjective and adverb. Borrowing (nine words), Compounding (38 words), and other methods of word production were also detected. Eliminating five (5) words Two-word “convert” and three-word “acronym”.

References

1. Y. Yamamoto and R. Nitta, “Action-Oriented Approach to Curriculum Development in CLIL Courses : A theoretical and methodological framework,” vol. 2, pp. 122–135.
2. Nur Amalia Atikah, Siti Zalifah Ramli, Nur Ain Najihah Ibhari, Siti Aishah Zahari, and Muhammad Asyraf Abdullah Zawawi, “Learn Idioms Using Augmented Reality,” *Int. J. Multimed. Recent Innov.*, vol. 3, no. 1, pp. 11–16, 2021, doi: <https://doi.org/10.36079/lamintang.ijmari-0301.209>.
3. N. S. I, K. F. Aryati, I. P. A. E. Susanta, and W. A. A. I, “The Development of Syllabus and Lesson Plan Based on English for Occupational Purposes,” *Int. J. Psychosoc. Rehabil.*, vol. 24, no. 04, pp. 290–300, 2020, <https://doi.org/10.37200/ijpr/v24i4/pr201009>.
4. T. Y. P. P. S. P. B. I. Adi Iwan Hermawan, Nouval Rumaf, “Analisis Abbreviation Bahasa Game Online Pada Permainan Mobile Legend (Kajian Morfologi),” *J. Keilmuan Bahasa, Sastra, dan Pengajarannya*, vol. Volume (1), no. 1, pp. 8–18, 2020.
5. K. . E. S.-B. and R. H. B. Denistia, “Semantic Vector Model on the Indonesian Prefixes pe- and peN-,” *Proc. 11th Int. Conf. Ment. Lex.*, pp. 1–4, 2019.
6. N. K. R. Erawati, “The relativity strategy of old javanese,” *J. Lang. Teach. Res.*, vol. 8, no. 6, pp. 1100–1108, 2017, doi: <https://doi.org/10.17507/jltr.0806.10>.
7. B. Thompson and M. Post, “Paraphrase Generation as Zero-Shot Multilingual Translation: Disentangling Semantic Similarity from Lexical and Syntactic Diversity,” *5th Conf. Mach. Transl. WMT 2020 - Proc.*, pp. 561–570, 2020.
8. Z. Juhász, E. Dudás, A. Vágó-Zalán, and H. Pamjav, “A simultaneous search for footprints of early human migration processes using the genetic and folk music data in Eurasia,” *Mol. Genet. Genomics*, vol. 294, no. 4, pp. 941–962, 2019, doi: <https://doi.org/10.1007/s00438-019-01539-x>.
9. L. A. Gelles, S. M. Lord, G. D. Hoople, D. A. Chen, and J. A. Mejia, “Compassionate flexibility and self-discipline: Student adaptation to emergency remote teaching in an integrated engineering energy course during covid-19,” *Educ. Sci.*, vol. 10, no. 11, pp. 1–23, 2020, doi: <https://doi.org/10.3390/educsci10110304>.
10. Fatoni *et al.*, “University students online learning system during Covid-19 pandemic: Advantages, constraints and solutions,” *Syst. Rev. Pharm.*, vol. 11, no. 7, pp. 570–576, 2020, doi: <https://doi.org/10.31838/srp.2020.7.81>.
11. I. G. Torre, B. Luque, L. Lacasa, C. T. Kello, and A. Hernández-Fernández, “On the physical origin of linguistic laws and lognormality in speech,” *R. Soc. Open Sci.*, vol. 6, no. 8, 2019, <https://doi.org/10.1098/rsos.191023>.
12. B. K. Fatma and Y. Y. Mehmet, “The frequency of using idioms in writing for the students learning Turkish as a foreign language,” *Educ. Res. Rev.*, vol. 13, no. 16, pp. 602–608, 2018, doi: <https://doi.org/10.5897/err2018.3585>.

13. S. Bulqiyah, M. A. Mahbub, and D. A. Nugraheni, "Investigating writing difficulties in essay writing: Tertiary students' perspectives," *English Lang. Teach. Educ. J.*, vol. 4, no. 1, p. 61, 2021, doi: <https://doi.org/10.12928/eltej.v4i1.2371>.
14. M. A. Hamid, D. Hilmi, and M. S. Mustofa, "Pengembangan Bahan Ajar Bahasa Arab Berbasis Teori Belajar Konstruktivisme Untuk Mahasiswa," *Arab. J. Arab. Stud.*, vol. 4, no. 1, p. 100, 2019, doi: <https://doi.org/10.24865/ajas.v4i1.107>.
15. F. Hamdi and N. Juita, "Reduplikasi Morfemis dalam Bahasa Mentawai di Kecamatan Siberut Barat Kabupaten Kepulauan Mentawai," *J. Bhs. dan Sastra*, 2019.
16. H. Asma and S. Dallel, "Cognitive Load Theory and its Relation to Instructional Design: Perspectives of Some Algerian University Teachers of English," *Arab World English J.*, vol. 11, no. 4, pp. 110–127, 2020, doi: <https://doi.org/10.24093/awej/vol11no4.8>.

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