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Morphology of COVID-19 Neologisms in Modern Standard Arabic

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Abstract

This study investigates the morphological behavior of Modern Standard Arabic (MSA) in terms of developing neologisms related to the new requirements imposed by the outbreak of COVID-19. The data of the study was collected from the news reports of Al-Mamlakah TV, as being the most viewed channel in Jordan during the COVID-19 crisis. The findings of the study revealed that a majority of the collected neologisms were nouns, which provided further support to the theory of onomasiology (Štekauer, 1998). Compounding, borrowing (loan-translation, Arabicization, and hybridization), and semantic extension formed the major word-formation processes for creating such neologisms. Compounds fell into three categories depending on their internal structures: N+Adj, N+N, and more elaborate complex compounds. The first two types were discussed in terms of their headedness and internal syntactic structure with a special reference to the cross-linguistic criteria that were used to identify such compound constructs, whereas the analysis advanced for the third type was inspired by Carstairs-McCarthy (2017). The data analysis revealed interesting aspects in the morphology of COVID-19 neologisms, most noticeably, the higher productivity of (N+N) compounds than (N+Adj) compounds, which goes against the putative assumption that the latter is much commoner in Arabic, identifying new compound types in MSA, namely, N+A metaphoric compounds and N+N hybridized compounds, and the possibility of having newly created three-member complex compounds (i.e., compounds within compounds).

Keywords: COVID-19; neologisms; compounding; borrowing; semantic extension

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INTRODUCTION

The increasing rate of people infected by COVID-19 around the globe evoked public concerns as people wanted to avoid being infected with the risky virus (Sahu, Mishra, & Lal, 2020). This rang alarms all over for the world authorities including the World Health Organization (WHO). The Coronavirus epidemic did not only affect the world health systems, but it also had noticeable linguistic impacts where new words and phrases were adopted across the world. Updates have been made by lexicographers to cover the language of COVID-19, e.g. The Oxford English dictionary (OED) attempted to include the newly created words that were related to the epidemic. According to Bernadette Paton (The Oxford dictionary's executive editor), it is *"a rare ex*perience for lexicographers to observe an exponential rise in usage of a single word in a very short period of time, and for that word to come overwhelmingly to dominate global discourse, even to the exclusion of most other topics" (The Guardian, 2020).

The pandemic has led to the emergence of many words, phrases and terms in different languages. For example, the words 'COVIDiots' and 'quarantine' are now widely spread across different social media platforms in most English-speaking countries. More importantly, the speed of the linguistic change that is associated with COVID-19 is unprecedented. This might be related to the fact that the virus has spread at a super-fast pace and to its dominance in the media in its different forms. Since human language is a dynamic entity which keeps growing day by day, the users of any language can create novel lexical items according to the requirements they face, sometimes by taking the help of existing words in the language (Khan, 2013). As new information is being generated by global events, we need to coin new words and names for the new things and ideas that come into existence suddenly. neologism is "...a unit of the lexicon, a word, a word element or phrase, whose meaning, or whose signifier-signified relationship, presupposing an effective function in a specific model of communication, was not previously materialized as a linguistic form in the immediately preceding stage of the lexicon of the language" (Rey, 1995).

Under the umbrella of neologisms, new editions can be made by virtue of different word-formation processes. As in the case of COVID-19 discourse in Arabic. The aim of the present study is to investigate the formation of neologisms in MSA during the outbreak of COVID-19. More specifically, the present study explores the morphology of novel linguistic items related to COVID-19 in MSA and provides an overview of the internal structures of such neologisms. The significance of this study stems from the fact that it is the first study that tackles the morphology of COVID-19 neologisms in MSA. Accordingly, the findings of this study form a substantial addition to the literature of morphology in general and that of Arabic morphology in particular, and provides researchers with better insights into this field.

In terms of presentation, the paper is organized as follows: The next section sets the stage for the current study and highlights the major tenets of word-formation processes as discussed in literature. After that, the methodology in terms of data collection and data analysis is highlighted, followed by the results of the study. The last section encompasses the discussions and conclusions as well as some recommendations for future research.

LITERATURE REVIEW

COVID-19 is a shortening of coronavirus where 'corona' is a Latin word that means 'crown'. It is so-named due to its shape that looks like a crown (Collins English Dictionary). As a result of the COVID-19 outbreak, novel linguistic items, i.e., words, compounds, and phrases started to be used in mass media and social media. From the beginning of the virus outbreak in 2019 till these days in 2021 many words have been created for the purpose of describing and naming the virus in the world as a whole and in the Arab world in particular, such as: [fayrus ku:ru:na:] 'coronavirus', [ku:fi:d naynti:n] 'COVID-19', [ku:ru:na:] 'corona', [tha:t r-ri?ah] 'Pneumonic'. Many words related to the virus which exhibited social and medical impacts were also attested in MSA. Examples of such words include: [sulsulat l-ʕadwa:] 'chain of infection', [manaṣat s-safar] 'travel platform', and many others that are all frequent in this context.

The existing words in a language can be considered as neologisms when they denote a new sense according to the novel context or need. "A neologism is a new word or sense of a word" (Peprnik & Jaroslav, 2006), which always sheds light on recent perspectives in the social context. For example, in case of the previous instances, e.g., both [sulsulat] 'chain' and [l-ʕadwa:] 'infection'

already existed in MSA, but they now denote a new sense as a compound. Creating new words helps us to study the variations or changes that take place in language (Khan, 2013). New phenomena often carry new expressions that normally evoke linguists' attention. Angeli (2012), Balteiro (2017), Wallis and Nerlich (2005), Jeon and Yu (2016) and many others, for example, have dealt with different global infectious disease outbreaks such as SARS, MERS, and Ebola to examine the metaphorical expressions generated during these outbreaks. Moreover, other researchers have dealt with other issues including euphemism and dysphemism in Jordanian Arabic in the context of COVID-19 (Olimat, 2020), as well as with linguistic strategies (i.e., persuasive strategies) that were employed by the Jordanian government in fighting COVID-19 (Alkhawaldeh, 2021).

A study by Saleh (2021) investigated the linguistic behavior of newly created English words that emerged during the COVID-19 crisis. The study focused mainly on the word-formation processes that took part in the emergence of these newly created expressions in the English language. Similarly, Akut (2020); Asif, Zhiyong, Iram, and Nisar (2021); Khalfan, Batool, and Shehzad (2020) investigated the nature of the English neologisms emerged during the crisis. Some recent studies have examined the ability of English to accommodate new events and crises (i.e., created by COVID-19) by analyzing the neologisms that were created as a response to the new happenings. A study by Bharati (2020) analyzed and explored the newly emerged words in English which were accompanied by the spread of the pandemic. The study was established on the theory of neologism as debated by several scholars such as Plag (2018) and Yule (2020). It classified COVID-19 related neologisms according to the word-formation processes used to create them plus tracing their origins. Mweri (2021) examined the nature of neologisms coined or introduced into English via several morphological processes such as acronymy, blending, or semantic change. The study shed light on the way such neologisms were socially used in the context of the crisis. It accounted for the changes that took place in the language use depending on MAK Halliday functional theory.

Wang and Huang (2021) attempted to explore the evolution of linguistic expressions (i.e., neologisms) during the COVID-19 crisis in English and Chinese in two Chinese cities. It focused on the newly created English and Chinese words that were used in public health posters during the pandemic. The study showed how some original Chinese terms were gradually substituted by the English neologisms motivating new loan translations in Chinese. Another study was conducted by Khalfan et al. (2020) to investigate COVID-19 related neologisms in the light of the language-mind relationship. It examined a list of COVID-19 neologisms used on social media in order to explore the motive behind their creation. It was observed that the user's perception influenced the creation of the newly created linguistic expressions. This means language was influenced by the perception in both usage and discourse. Lei, Yang, and Huang (2021) in their study of COVID-19 neologisms, concentrated on the strategies followed to create newly coined linguistic items, the relationship of such strategies with the priority of use. Three strategies were identified in the creation of COVID-19 neologisms, namely, synthesis, avoidance, and categorization. The study investigated the neologisms' life cycle and illustrated the engagement between the novel happenings and novel linguistic items.

Haddad and Montero (2020) conducted a corpus-based case study that attempted to investigate English COVID-19 related neologisms and their Arabic equivalents, particularly the competency of the use of the term 'coronavirus' in Arabic and English media. Precisely, the study shed the light on the formation of the Arabic equivalents of the neologisms associated with the pandemic that were loan words from English such as [ku:ru:na: fayrus] 'coronavirus', [ku:ru:na:] 'corona', and [ku:fi:d -19] 'COVID-19'. According to Haddad and Montero (2020) these loans did not preserve the genuine metaphoric image created in English. This motivated the Arabic speakers to have their own adequate original terms that expressed the Arabic cultural and conceptual image. A recommended Arabized version of the neologism was [l-fayrus-shshawki:] 'the spinous virus' which described the spinous ends of coronavirus. The existence of such Arabized version along with the English loans can simplify the global interaction and communication especially at scientific and technical terms level. Moreover, it assisted to keep the Arabic language updated. A similar Arabized version of such neologisms was found by the researchers of the present study and used in MSA which was [l-fayrus-tta:ji:] 'corona virus' that describes the shape of the virus similar to the crown.

Štekauer (1998) had offered an inventive approach to the complicated problems of English word-formation. This was termed as onomasiology model which focused on the process of creating novel naming items. This approach took the naming demands or needs of speech communicated as its point of departure. Newly created linguistic items (i.e., neologisms) in language were mainly coined in order to provide names for the new concepts (i.e., objects or ideas) within a specific speech community. Thus, onomasiology dealt with how speakers of a given language lexicalized existing concepts in their speech communities . When speakers of a given speech community faced new concepts, objects, or ideas, they asked for their names. An example of an onomasiological question is 'what is the name for a novel concept, object, idea, or social behavior in the context of COVID-19?' When speakers tried to name novel entities, they resorted first to the existing words or decided to create a novel linguistic item.

A neologism (from Greek 'néo-' which means "new" and 'lógos' with the meaning "utterance or speech") is a comparatively new word or phrase which may be under processing to enter common use (Anderson, 2006). David (1992) stated that neologism is the formation of new words as a result of the changing circumstances in the external globe. The idea of novelty can be conveyed by the newly coined lexical items. The new items in language are continuously increasing to express new notions and concepts. On the contrary, the old words decrease by the time. To further elaborate, a neologism is a linguistic unit that is used to define novel notions, objects, phenomena or ideas (Mostovy, 1994); as mentioned in Onyedum (2012). It is clear that this definition is aligned with the new words used in the context of COVID-19. Neologisms can enter a language through different ways, i.e., loan words, loan translations, or newly coined words. Newly created or coined words refer to either existing words with a new meaning (semantic content), which may be a case of semantic extension, or totally newly created words (morphologically new words) (Khan, 2013). A neologism must become common to the public through its usage in a given context (Banjar, 2011).

It is also important to mention that some words which are listed as neologisms are not totally new. Rather, they were shifted from being technical and specialized terms in particular fields to come in common use, or vice versa, and provide some instances of *semantic extensions*. Many specialized terms which are nowadays used in the context of COVID-19, fall under this category. For example, although [fatrat l-ḥaḍanah] 'Incubation period' can be considered as a medical term, it is nowadays widely used due to its heavy usage on print, social media, and mass media. It is worth indicating that MSA started to absorb numerous foreign elements due to the interaction with other world languages. This permitted the users of the language to create novel expressions and these elements were commonly used by mass media. Actually, media helped a lot in introducing such newly coined expressions.

MSA makes use of various morphological processes in order to generate new words such as borrowing, compounding and semantic extension. Borrowing is one of the ways that neologisms can be coined with, through copying a linguistic item which is initially part of one language into another language. Loan words, loan translations or calques, and Arabicization are included under the umbrella of borrowing. A calque is a kind of borrowing where the elements of the borrowed word or phrase are translated one by one into their equivalents in the new language (Crystal, 2008). Examples of Arabicized words and loan translations are respectively [ku:ru:na:] 'corona' and [t-taba:ˤud l-ʔijtima:ˤiy] 'social distancing'. Moreover, compounding is one of the commonest morphological processes that helps to create words in a given language by joining at least two elements and the result will be an independent word or a free form. An example of compounding from MSA is [qa:nu:n-u d-difa:ˤ] 'the defense law'.

The process of joining words that belong to two different languages or codes is defined as *Hybridization* (Khan, 2013). It is used in MSA to coin new words, e.g., [l-mutaḥawwir dilta:] 'the delta variant', where the word [dilta:] 'delta' is a borrowed word (i.e., to be more precise an Arabicized word) from English while [l-mutaḥawwir] 'the variant' is an original Arabic word. An example of semantic extension is [ʔama:n] 'safety', which is nowadays an application used in Jordan and alerts users if they come into contact with a person infected with the virus.

It is clearly notable, by reviewing the literature, that the internal structure of novel linguistic items (i.e., neologisms) related to COVID-19 in MSA has not yet been analyzed linguistically. Therefore, the present study attempted to build an accurate morphological categorization of the COVID-19 neologisms in MSA.

METHODOLOGY

- *Research Design:*

The framework of the present research was based on several components of neologism, i.e., compounds (unusual collocations), semantic extension, and borrowing which included Arabicized words, loan translations, and hybridization. The qualitative data was collected from the news reports of Al-Mamlakah TV for the purpose of the analysis. Quantitatively, the frequency of neologisms was indicated for each category (i.e., word formation process) to show their distribution.

- *Data Collection Methods:*

In order to analyze neologisms related to COVID-19 in Modern Standard Arabic, the researchers collected the data from the news reports of Al-Mamlakah TV during the crisis from March 10, 2020, to July 15, 2021. Al-Mamlakah TV was selected as being the most viewed channel in Jordan during the crisis according to the research agency Ipsos Jordan (Al-Mamlaka TV, 2020). The channel website had designed a special segment for COVID-19 news (Al-Mamlaka TV), which helped researchers to compile the required instances. The validity of the linguistic data used in the present study stemmed from the fact that most of the neologisms collected and used in the present study had been used on the Arabic website of (WHO, 2021) as adequate Arabic equivalents. Precisely, the source of data (e.g., Al-Mamlakah TV news reports) took COVID-19 information from the Arabic version of the WHO website. The total number of the collected instances was (56) distributed in Table:

Table 1. *The distribution of the collected data*

	Category	Frequency	Percentages (%)
Compounds	Noun + Adjective	10	17.9%
	Noun + Noun	19	33.9%
	Elaborate compounds	8	14.2%
Total		**37**	**66%**
Borrowing	Loan Translation	3	5.4%
	Arabicization	5	8.9%
	Hybridization	8	14.3%
Total		**16**	**28.6%**
Semantic extension	Semantic extension	**3**	**5.4%**

- *Sampling and Procedure:*

The researchers first compiled a corpus of 187 COVID-19-related neologisms, then filtered out terms that were repeated or were irrelevant, depending on linguistic criteria inspired by the literature, e.g., the cross-linguistic criteria for identifying N+N and N+Adj compounds that were suggested by many scholars in the field of linguistics (A. R. M. S. Altakhaineh, 2016; Bauer, 1998, 2003; Borer, 2009; Fabregas, 2012; Katamba & Stonham, 2006; Lieber & Štekauer, 2009).

A filtered out list of COVID-19-related neologisms, consisting of (56) neologisms was eventually classified into different categories according to the morphological processes used to form them (e.g., compounding, semantic extension, borrowing which included Arabicized words, loan translations, and hybridization). Some instances of each category were selected for the purpose of analysis and illustration. The collected data was in Modern Standard Arabic, not Colloquial Arabic since the source of the data (i.e., Al-Mamlakah TV) used MSA in the verbal and written news reports. The collected words were picked carefully from the sources for the purpose of the study, namely, to figure out the word formation process(s) responsible for creating each one of them. Finally, these neologisms were classified accordingly. The collected Arabic neologisms were first transcribed and translated. Sub-categories of some main categories (i.e., compounding) were added according to their internal structure.

- *Data Analysis:*

The linguistic data collected was analyzed qualitatively. For this purpose, several examples were discussed with a special focus on the morphological process(s) involved in their formation plus showing their internal structure. The transliteration of the Arabic words was given first, followed by their English translation. Additional details (i.e., grammatical, and semantic information) were added when required.

FINDINGS AND RESULTS

This section presents the major findings of the present study. The processes that were extensively used to create novel words in MSA within the context of COVID-19 were classified and discussed with ample exemplification. The data analysis revealed that MSA utilized five morphological processes to create neologisms related to COVID-19, namely, compounding, semantic extension, Arabicization, hybridization, and loan-translation, where the last three were subsumed under the umbrella of borrowing.

1. Compounding

Compounding is, generally, a morphological process that involves joining more than one root or word together to create a new word with a new meaning. Although the words used to create a compound may form an original part of the language, they generate a new word with a new meaning (or notion), when joining them. To be accurate in the selection of COVID-19-related compounds in MSA, all the following listed compounds under this section have undergone different tests and criteria (i.e., cross-linguistic criteria) with special reference to Altakhaineh's definition of N+N and N+Adj compound in MSA (2016; 2019). The following section is designed to discuss the criteria that were used for choosing N+N and N+Adj compounds.

Compounding is one of the commonest morphological processes which are used to add new words to a language. The role of compounding is noticeable in creating new words related to COVID-19 context in MSA. For instance, the word [manassah] 'platform' is combined to different words to give different senses as shown in (1):

(1)

a. [manassat-u darsak]
platform your-lesson

'An educational platform developed by the Jordanian Ministry of Education during the crisis'

b. [manassat-u s-safar]
Platform travel
'Travel platform'

According to Carstairs-McCarthy (2017), "some types of compounds are much commoner than others" (p. 59). The technical and cultural changes are considered as motives that lead to create new artifacts more than the new properties or activities. Thus, such changes introduce new lexical items that are more easily answered by novel nouns than by novel adjectives or verbs (Carstairs-McCarthy, 2017). Hence, compound nouns are much commoner than the others. In the following subsections, novel compounds in MSA are presented and classified morphologically according to their internal structure. It is worth to be noted that all the compounds found and collected are compound nouns. The distribution of the different manifestations of compound nouns within the compounding category is shown in Table (2).

Table 2. *The distribution of Compounds*

	Category	Frequency	Percentages (%)
compounds	Noun + Adjective	10	27%
	Noun + Noun	19	51.4%
	Elaborate compounds	8	21.6%
Total		**37**	**100%**

i.Cross-Linguistic Criteria for Identifying Compounds

This section aims to differentiate between two similar but distinguishable constructs of MSA, namely, phrases and compounds having N+N and N+Adj combinations. Many scholars in the field of linguistics (A. R. M. S. Altakhaineh, 2016; Bauer, 1998, 2003; Borer, 2009; Fabregas, 2012; Katamba & Stonham, 2006; Lieber & Štekauer, 2009) have suggested a group of criteria that distinguishes compounds from phrases since the difference in many cases is subtle and unclear. A. R. M. Altakhaineh (2019); A. R. M. S. Altakhaineh (2016) has developed a list that compiles these criteria including syntactic, semantic, phonological, and orthographic criteria to characterize N+N compounds and N+Adj compounds showing the differences between them and similar phrasal patterns having the same N+N and N+Adj combinations.

Compound nouns consisting of N+N and N+Adj form the major category among the other collected neologisms that belong to other word-formation processes. Thus, the researchers have adopted these cross-linguistic criteria to filter out N+N and N+Adj compounds in MSA and to avoid listing phrases that have the same structure as compounds. It deserves to mention that only the most relevant and reliable criteria were selected for the purpose of distinction. Precisely, among ten criteria compiled by A. R. M. Altakhaineh (2019), only six criteria were selected due to their appropriateness for the present study, namely, the semantic criterion which is *Referentiality* and the syntactic criteria (which are: *Adjacency, Resumptive coordination, Inflection, Definiteness, and Cardinal numbers*). This refers to the fact that the excluded criteria were either not applicable (e.g., *Phonological, orthographic, and replacement of the second element by a pro-form*) or partially applicable i.e., they can distinguish phrases from non-compositional compounds (e.g., *compositionality* and *ellipsis*) (see A. R. M. Altakhaineh (2019)). These criteria were excluded because all the compounds found in the present study were almost compositional.

The semantic criterion (i.e., *Referentiality*) is a reliable test that can be used to differentiate between both types of N+N structures, which are compounds and possessive phrases. It was found that the second element (i.e., non-head) of possessive phrases is referential in MSA. On the other hand, the second element (i.e., non-head), of the two types of compounds, is non-referential. However, there is an exception in case of the second elements (i.e., non-heads) that are proper nouns or refer to unique entities. We can apply this test to differentiate between the phrase [buʔrat-u l-waba:ʔ] 'epicenter of the epidemic' and the compound [qa:nu:n-u d-difa:ʕ] 'the defense law'. In previous examples, the second element [l-waba:ʔ] 'epidemic' of the phrase refers to a particular entity in the world, whereas the non-head [d-difa:ʕ] 'the defence' of the compound does not refer to a particular [d-difa:ʕ] 'the defence'. To further illustrate, using the demonstrative [ha:dha] 'this' before the non-head of the compound produces an ill-formed structure i.e., [qa:nu:n-u (*ha:dha) d-difa:ʕ] 'the law of (*this) defense'. The demonstrative cannot refer to the second element because the second element does not have a specific referent in a speaker's mind. On the other hand, the second element of the phrase accepts the insertion of the demonstrative [ha:dha] 'this' as it refers to a specific [waba:ʔ] 'epidemic'.

The rest criteria of the are said to be syntactic or morphosyntactic. The Adjacency test was used to distinguish between phrases and compounds in the present study through examining the elements of N+N constructs whether separable or inseparable. Generally, the elements (i.e., first and second element) of possessive phrases and compounds do not accept inserting an intervening element (e.g., an adjective) between them. Nevertheless, it was found that a demonstrative like [ha:dha] 'this' can be used as an intervening element in case of phrases, but it is impossible to insert it between the two elements of compounds (see A. R. M. Altakhaineh (2019)), e.g., [buʔrat-u ha:dha l-waba:ʔ] 'epicenter of this epidemic' is acceptable, whereas [qa:nu:n-u (*ha:dha) d-difa:ʕ] 'the law of (*this) defense' is not. However, the two elements of compounds accepted the insertion of a demonstrative like [ha:dha] 'this' only if the non-head element was a proper noun or had a unique reference as mentioned earlier.

The second syntactic criterion employed by the researchers was resumptive coordination. For example, in [buʔrat-u l-waba:ʔ wa markazi-h] 'epicenter of the epidemic and its center', the resumptive pronoun [-h] in the coordinated noun i.e., [markazi-h] 'its center' refers back to the non-head [l-waba:ʔ]. In contrast, compounds do not permit such kind of coordination, e.g., [qawa:ni:n-u d-difa:ʕ (*wa ʔahka:mu-h)] 'the defense laws and (*its provisions)'. Here a resumptive pronoun like [-h] in the coordinated noun [ʔahka:mu-h] 'its provisions' cannot refer back to the non-head [d-difa:ʕ] 'defense'. The coordination can be acceptable if the resumptive pronoun refers back to head [qawa:ni:n] 'laws-FPL' as in [qawa:ni:n-u d-difa:ʕ wa ʔahka:mu-ha)] 'the defense laws and their provisions'.

The inflectional test was also employed for the purpose of distinction. The head element of compounds as well as phrases can be freely pluralized, but only the second elements (i.e., non-heads) of phrases can be pluralized, whereas the second element of compounds do not allow such pluralization. This refers to the fact that the second elements of compounds in MSA are non-referential, and the pluralization does not have any semantic contribution to the meaning of the compound (A. R. M. Altakhaineh, 2019). For instance, the non-head [l-waba:ʔ] 'epidemic' of the phrase [buʔratu l-waba:ʔ] 'epicenter of the epidemic' can be freely pluralized to be [buʔar-u l-ʔawbiʔah] 'epicenters-FPL of the epidemics-FPL' agreeing with the first element in number and

gender. In contrast, the non-head [d-difaːˤ] 'the defense' of the compound [qaːnuːn-u d-difaːˤ] 'the defense law' cannot be pluralized even if the head [qa;nuːn] 'law' is pluralized as in [qawaːniːn-u d-difaːˤ] 'the defense-MSG laws-FPL'.

It is therefore clear that the non-head [d-difaːˤ] 'the defense-MSG' does not agree with the head [qawaːniːn] 'laws-FPL' to be in its gender and number unlike phrases. It is worth mentioning that some compounds allow the plural marker to take place on the non-head, e.g., [khaliyat l-ʔazamaːt] 'Crises-FPL Cell-FSG'. However, the meaning of the compound as a whole is not affected. Thus, no matter whether the compound is [khaliyat l-ʔazamaːt] 'Crises-FPL Cell-FSG', [khalaːya: l-ʔazamaːt] 'Crises-FPL Cells-FPL', or [khalaːya: l-ʔazmah] 'Crisis-FSG Cells-FPL', the meaning of the compound will be denoted on the basis of its head, no matter whether or not the non-head is pluralized.

The following two criteria *definiteness* and *cardinal numbers* were discussed by A. R. M. Altakhaineh (2019) as being language specific criteria to differentiate compounds from phrases in MSA. It was found that the attachment of the definite article [l-] 'the' to the first element of a phrase forces the second element to be marked with the possessive marker [li-] 'for, of', e.g., [l-buʔrat-u li-l-wabaːʔ] 'the epicenter of the epidemic'. In contrast, the possessive marker [li-] 'for, of' was not permitted to be linked to the non-head of compounds when the head was marked with the definite article [l-] 'the', e.g., [*l-qaːnuːn-u l-id-difaːˤ] 'the law for the defense-GEN'. The last criterion was related to the effect of cardinal numbers. It suggests that the addition of cardinal numbers before the first element of a possessive phrase triggers the appearance of the possessive marker [li-] 'for, of' before the second element, e.g., [thalaːth-u buʔar-in li-l-wabaːʔ] 'three-M epicenters-F of the epidemic', taking the following Arabic rule in consideration: (cardinal numbers from 3-10 must disagree in gender with the nouns that follow them).

On the other hand, the possessive marker [li-] 'for, of' is not allowed to be linked to the second element of compounds in MSA even if their first elements are preceded by a cardinal number, e.g., [khams-u qawaːniːn difaːˤ] 'five-M laws-F of defense'. In this example, we can notice that the addition of the cardinal number [khams] 'five' before the noun [qawaːniːn] 'laws' has another effect on the second element which is omitting the definite article [l-] that was attached to the second element.

As for N+Adj constructs in MSA, Ryding, Press, and ProQuest (2005) considers them as phrasal constructs rather than compounds since their second element (i.e., adjective) modifies their first element (i.e., noun). Moreover, their second element agrees in definiteness, gender, and number with their first element, e.g., [l-ḥajr l-manziliy] 'home-MSG isolation-MSG. However, A. R. M. Altakhaineh (2019), suggests that some N+Adj constructs can be considered as compounds as they fulfill an important test for compoundhood which is *Adjacency*. For example, [t-taˤliːm l-waja:hiy] 'face-to-face learning' is inseparable in which it does not accept inserting an element between its first and second elements. Thus, [*t-taˤliːm l-muba:shir l-waja:hiy] 'face-to-face direct learning' is not acceptable in MSA, whereas [t-taˤliːm l-waja:hiy l-muba:shir] 'face-to-face direct learning' is acceptable. Referring back to the phrase [l-ḥajr l-manziliy] 'home-MSG isolation-MSG, we can notice that it accepts inserting an element between its first and second elements, e.g., [l-ḥajr dh-dha:tiy l-manziliy] 'home self-quarantine' as used in some news reports. Thus, inserting an adjective between the two elements of a phrase is allowed, but such insertion is certainly not acceptable in case of compounds.

However, we argue that there are other instances of N+Adj constructs that can be regarded as compounds, to be precise, we would refer to them as metaphoric compounds. For example, [wijha:t khaḍra:ʔ] 'green-FPL destinations-FPL' can be considered as a compound (i.e., metaphoric compound) rather than a phrase regardless of the agreement between its elements in number and gender. It is used during the crisis to refer to the countries that are free of Corona or that have controlled Corona, so people can travel to them or come back from them. We can notice that its meaning is Corona-specific (i.e., related to Corona). Here the adjective [khadra:ʔ] has a symbolic use expressing that 'it is allowed to pass' as in case of traffic lights. Thus, such a compound is non-compositional as its meaning cannot be predictable on the basis of the literal meaning of its parts, e.g., [wijha:t khadra:ʔ] 'green destinations' does not denote destinations that are green in color. To illustrate, we cannot modify it with an adjective like [gha:miqah] 'dark-FPL' to be [wijha:t khadra:ʔ gha:miqah] 'dark green destinations'. Such semantic behavior is followed by compounds rather

than phrases as they tend to have unpredictable meaning (McCarthy, 2017). If the compound [wijha:t khadra:ʔ] 'green-(allowed) destinations' is compared with the phrase [sayya:ra:t khadra:ʔ] 'green cars', we can distinguish between the predictable and direct meaning of the phrase and the metaphoric meaning of the compound.

ii. Compound Nouns Consisting of Noun + Adjective

English compound nouns are created on the form [X + (n.) = compound Noun] where X is: noun, adjective, preposition, or verb, e.g., *playtime*; Verb-Noun (VN), *bookstore*; Noun-Noun (NN), *green house*; Adjective-Noun (AN), *Outpost*; Preposition-Noun (PN) (McCarthy, 2017, p. 62). All the previous English instances have their head on the right-hand which is a noun. The head, which is on the right or (the second element) of the compound, is the element that determines the part of speech of the whole expression or compound.

Arabic, by contrast, follows a different pattern, where the head of compounds is the first element, contrary to English. Thus, the head of Arabic compounds is the left-hand element (A. R. M. Altakhaineh, 2019; Fehri, 2012). Accordingly, Arabic compound nouns are created on the form [(n.) + X = compound noun] where X is: noun, adjective, or verb. Note that texts in Arabic are read and written from right to left. The example compounds listed in the following table are compound nouns consisting of a Noun + Adjective.

Table 3. *Compound nouns consisting of Noun + Adjective (NA)*

No.	Transliteration	English	Components
1.	[t-taʿli:m-u l-mudmaj]	Blended learning	N+A
2.	[wijhat-un khadra:ʔ]	Green destination	N+A
3.	[wijhat-un safra:ʔ]	Yellow destination	N+A
4.	[wijhat-un hamra:ʔ]	Red destination	N+A
5.	[t-taʿli:m-u l-waja:hiy]	Face-to-face learning	N+A
6.	[t-taqassi: l-waba:ʔiy]	Epidemiologic investigation	N+A
7.	[mukha:lit lasi:q]	Close contact	N+A
8.	[l-muʔashshir-u l-waba:ʔiy]	Epidemiological indicator	N+A
9.	[l-munhana: l-waba:ʔiy]	Epidemiological curve	N+A
10.	[sanad ʔakhdar]	Green *sanad* 'document'	

Reviewing the above examples reveals that all the newly created compounds in Table (3) are compound nouns on the form (*NA*). The first element of all compounds in Table (3), is the head noun of the whole compound. It determines the basic meaning and the part of speech of the whole compound. The first compound noun [t-taʿli:m-u l-mudmaj] 'blended learning' in Table 3, for example, consists of the noun [t-taʿli:m] 'learning', which is the head noun, and the adjective [l-mudmaj] 'blended'. By applying the criterion of adjacency, we make sure that it is a compound rather than a phrase, we find that we cannot insert elements between the elements of [t-taʿli:m-u l-mudmaj] 'blended learning'. Thus, [t-taʿli:m-u l-mudmaj l-majja:niy] 'free blended learning' is acceptable, whereas [*t-taʿli:m-u l-majja:niy l-mudmaj], by inserting [l-majja:niy] 'free' between the elements of the compound, is not acceptable in MSA because they are inseparable.

This suggests that the agreement in definiteness, gender, and number between the elements of [t-taʿli:m-u l-mudmaj] 'blended learning' is purely morphosyntactic i.e., if the morphosyntactic features of the head [t-taʿli:m] 'learning-MSG' change to plural, for example, [*t-taʿli:ma:t] 'learning-FPL' and the adjective [l-mudmaj] 'blended-MSG' follow suit to be [l-mudmajah] 'blended-FPL', the result will be not acceptable e.g., [*t-taʿli:ma:t l-mudmajah] '*learning-FPL blended-FPL'. Precisely, the head noun [t-taʿli:m] 'learning-MSG' cannot be pluralized (i.e., uncountable), nevertheless, pluralizing the noun to be [t-taʿli:ma:t] '*learning-FPL' denotes a different meaning which is 'instructions-FPL'. We notice that the adjective in the previous example, which is the second element, modifies the head noun. Similarly, the same behavior is followed in [t-taʿli:m-u l-waja:hiy] 'face-to-face learning'.

The instances (2,3, and 4) in Table 3 are also inseparable in which their structures do not allow the insertion of any element between their first (i.e., head) and the second (i.e., non-head) elements. For example, the syntactic structure of instance no 4 [wijhat-un hamra:ʔ] 'destination-FSG red-FSG' does not permit the insertion of the adjective [mamnu:ʿah] 'forbidden-FSG' to be [*wijhat-un

mamnu:ˤah hamra:ʔ] 'destination-FSG forbidden-FSG red-FSG'. Similarly, the instances 2 and 3 follow the same behavior. The second element (i.e., adjectives) in (2, 3, and 4) agree with the first element (i.e., noun) in gender, number, and definiteness, however, they are regarded as compounds rather than phrases because of the following reasons: Syntactically, their elements are inseparable. Semantically, they tend to have unpredictable interpretation, e.g., [wijhat-un hamra:ʔ] 'red destination' does not denote a destination that is red in color, instead, it denotes a destination (i.e., country) that the government does not allow the people to travel to because Corona virus is out of control there. So, the symbolic meaning of colors, (e.g., red as dangerous or not allowed, green as safe or allowed), is employed here.

The researchers would refer to such constructs as metaphoric compounds as the metaphoric labels or symbols is employed in their meanings to denote a metaphoric meaning rather than a literal or direct meaning. In order to illustrate, we cannot modify them (i.e., 2, 3, and 4) with an adjective like [fa:tihah] 'light-FSG' to be [*wijhat-un hamra:ʔ fa:tihah] 'destination-FSG red-FSG light-FSG' '*light red destination'. An adjective like [fa:tihah] 'light-FSG' can modify the color with its literal meaning, but not the symbolic meaning. Such semantic behavior is followed by compounds rather than phrases as they tend to have unpredictable meaning (McCarthy, 2017). Compounds tend to have unpredictable meaning (McCarthy, 2017) or they can be interpreted depending on the context they are used in (i.e., COVID-19). The compounds 2, 3, and 4, for example, illustrate this behavior of compounds where their exact meaning is defined, according to the current context.

All the compound nouns listed in Table (3) follow the form N+A unlike their English counterparts that follow the pattern A+N (e.g., *green house)*. This is attributed to the fact that adjectives follow nouns in Arabic; adjectives are referred to as (followers) in Arabic because they follow nouns. Moreover, they follow nouns not only in the position, but also, they agree grammatically (i.e., inflectionally) with the noun they follow (Dahami & Saleh, 2012). For instance, the adjective [l-waba:ʔiy] 'epidemiologic' in (6) [t-taqassi: l-waba:ʔiy] 'investigation-MSG Epidemiologic-MSG' follows the noun [t-taqassi:] and it agrees with the noun in gender, number, and definiteness. For example, instance No 7 in Table 3 [mukha:lit lasi:q] 'close contact', when applying adjacency test, shows only one element inserted [ghayr] 'not' e.g., [mukha:lit ghayr-lasi:q] lit.'contact not-close', which is regarded as a prefix rather than a free morpheme as it cannot stand alone as meaningful unit (cf. (A. R. M. S. Altakhaineh, 2016)). Moreover, the meaning of the instance 7 is Corona-specific. Its exact meaning is defined, according to the current context, by the Center for Disease Control and Prevention (CDC). The definition suggests that "people are more vulnerable if they come within six feet of someone who tested positive for a cumulative total of 15 minutes".

Similarly, instance No 10 in Table 3 [sanad ʔakhdar] 'green *sanad* 'document' refers to a QR code should appear on a mobile application used in Jordan called *sanad*. If the user of that application is vaccinated, a green label appears. Thus, he/she can enter the public institutions. The previous instances listed in Table (3) were selected carefully among a large number of constructs that have similar structure (i.e., phrases), by applying adjacency test (cf. A. R. M. S. Altakhaineh (2016)), in addition to their different semantic behavior. The other examples of N+A constructs that formed a part of the initial collected data and failed to pass the adjacency test included [hajr dhakiy] 'smart quarantine', [ha:la:t muʔakkadah] 'confirmed cases', [l-ˤazl l-manziliy] 'home isolation', and many others.

To sum up, N+A Combinations, shown in Table (3), are regarded as compounds (i.e., phrasal compounds) as they behave syntactically (i.e., number, gender, definiteness agreement) like phrases, but they behave semantically as compounds. Such combinations can be distinguished from phrases as lexicalization has played an important role in their formation. In addition, they pass the adjacency test. In what follows, attention will be shifted to another pattern of compounds that is attested in MSA, namely, compound nouns consisting of Noun + Noun.

iii.Compound Nouns Consisting Of Noun + Noun

In this subsection, another pattern of compound nouns attested in MSA is highlighted. The internal structure of this subtype of compound nouns differs from the previous one in terms of the second element. While the second element (i.e., non-head) in the previous subtype of compound nouns involves an adjective, this subtype involves a noun in the respective position. Table 4 illustrates a few examples:

Table 4. *Compound nouns consisting of Noun + Noun (NN)*

No.	Transliteration	English	Type
1.	[fatrat-u hada:nah]	Incubation period	N+N
2.	[mantiqat-u ʿazl]	Isolation area	N+N
3.	[mana:ʿat-u l-qaṭi:ʿ]	Herd immunity	N+N
4.	[ʔamr-u difa:ʿ]	Defense order	N+N
5.	[qa:nu:n-u difa:ʿ]	Defense law	N+N
6.	[sulsulat-u l-ʿadwa:]	Chain of infection	N+N
7.	[lajnat-u l-ʔawbiʔah]	Epidemiology Committee	N+N
8.	[khaliyyat-u l-ʔazama:t]	Crises Cell	N+N
9.	[manassat-u s-safar]	Travel platform	N+N
10.	[manassat-u darsak]	*Darsak* 'your lesson' platform	N+N
11.	[manassat-u t-taṭʿi:m]	Vaccination platform	N+N
12.	[munhana: l-ʔisaba:t]	Case-curve	N+N
13.	[muʿaddal-u l-wafaya:t]	Deathrate	N+N
14.	[barna:maj-u taka:ful]	*Takaful* 'solidarity' program	N+N
15.	[barna:maj-u ʔistida:mah	*Istidamah* 'sustainability' program	N+N
16.	[firaq-u t-taqassi:]	Investigation teams	N+N
17.	[liqa:h ku:ru:na:]	Corona vaccine	N+N
18.	[waba:ʔ-u ku:ru:na:]	Corona epidemic	N+N
19.	[ja:ʔihat-u ku:ru:na:]	Corona pandemic	N+N

All the examples (1-19) reported in Table (4) are compound nouns consisting of two nouns. The first (i.e., the leftmost element) noun of these compounds is the head that determines the syntactic role and the meaning of the whole compound. The compound noun (1) [fatrat-u hada:nah] 'incubation period', for example, has a semantic head, that is [fatrat] 'period'. Semantically, it is a period that has something to do with the incubation of the virus. The rest of the compounds in Table 4 follow the same pattern. Hence, they can be referred to as compositional compounds (cf. A. R. M. Altakhaineh (2019)). However, the instance No 3 in Table 4, [mana:ʿat-u l-qaṭi:ʿ], 'herd immunity', may follow a different semantic behavior, in which the second element [l-qati:ʿ] 'herd' does not denote 'a group of animals' as it originally means in Arabic, but it denotes the community in the context of COVID-19.

All the N+N constructs listed in Table 4 are regarded as compounds rather than phrases as they achieve the cross-linguistic criteria. The second element (i.e., non-head) of Noun-Noun compounds in MSA is non-referential. Thus, the second elements of the compounds in Table (4) are non-referential. For example, the second instance in Table 4 [mantiqat-u ʔazl], 'isolation area' which is [ʔazl] 'isolation' is non-referential in the sense that it does not refer to a specific entity [ʔazl] 'isolation'. To further illustrate, [*mantiqat-u (ha:dha:) ʔazl] 'area (of *this) isolation' where the demonstrative [ha:dha:] 'this-MSG' refers to an entity denoted by [ʔazl] 'isolation' is unacceptable.

On the other hand, the first elements (i.e., heads) of all compounds listed in Table (4) are referential. We can say, for example, [mantiqat-u l-ʔazl ha:dhihi] 'this-FSG isolation-MSG area-FSG' where the demonstrative [ha:dhihi] 'this-FSG] refers to an entity denoted by the head [mantiqat] 'area-FSG'. We can find that the demonstrative [ha:dha:] 'this-MSG' or [ha:dhihi] 'this-FSG' cannot be inserted between the elements of the compounds listed in Table (4). Thus, they are inseparable as they achieve the adjacency test. They follow the same behavior of all N+N compounds in MSA, whereas N+N phrasal constructs accept such insertion.

The second elements of all instances, except instances No 7, 8, 12, and 13 in Table 4, cannot be freely pluralized as in N+N phrasal constructs. They can be pluralized by pluralizing their heads, thus, e.g. [ʔawa:mir-u d-difa:ʿ] lit. 'orders-FPL defense-MSG' is correct, whereas, [*ʔawa:mir-u d-difa:ʿa:t] lit. '*orders-FPL defenses-FPL' and [*ʔamr-u d-difa:ʿa:t] lit. '*order-MSG defenses-FPL' are unacceptable. Similarly, these compounds (7, 8, 12, and 13) behave differently in which the second elements (i.e., non-heads) are pluralized. This refers to the fact that these compounds were originally created with non-heads marked with plural markers, e.g., (13) [muʿaddal-u l-wafaya:t] lit. 'rate-MSG deaths-FPL'. Such constructs are regarded as compounds regardless of this behavior as they achieved the other cross-linguistic criteria. The instances 17, 18, and 19 in Table 4 involve

a kind of hybridization as they were created by joining two elements belonging to two different origins (i.e., languages). Precisely, the second element in instances 17, 18, and 19, which is [ku:ru:na:] is an Arabicized version of the English noun 'corona', whereas the first elements are original Arabic nouns. For further explanation of neologisms created by borrowing and hybridization.

Finally, it remains to highlight a couple of aspects related to the internal structures of COVID-19 neologisms. Though the two aforementioned combinations of the roots (N+Adj and N+N) are not by far new to the language (i.e., at the level of their form and structure), and most of the individual constituents of these compounds are already existent in the language, these roots and constituents were productively employed to come up with brand new compounds with new meanings, references, and usages during this unprecedented time. The combination (N+N) exhibited more productivity than the combination (N+Adj) which goes against the putative assumption that the latter is much commoner in Arabic (Amer, 2010, p. 13). This may refer to fact that most of N+Adj indicated compounds in the literature can be regarded as phrasal constructs rather than being compounds. It was found that the majority of newly created compound nouns in Ttable 4 (19 instances = 51.4% of all compounds) took the form (NN) rather than (NA), which formed only (27% of all the compounds; 10 instances). Arabic compounds related to COVID-19 are in line with McCarthy's (2017, p59) observation that compound nouns are more common than compound adjectives or compound verbs. However, the internal structures of such compound nouns exhibit that Noun-Noun Compounds (NN) are much commoner than other combinations of compound nouns like Noun-Adjective (NA).

iv.More Elaborate Compounds

The focus so far in previous subsections was on compounds consisting of only two elements. However, in this subsection the internal structure of some more complex compounds, i.e., compounds consisting of more than two members, is examined. The major tenets of the analysis advocated for this subtype of compounds, which are based upon McCarthy's (2017) analysis of English compounds, unfold as follows: the internal structure of such complex compounds is like the internal structure of complex words derived by means of affixation where affixes are attached to a root. More specifically, in the case of complex compounds there are words (i.e., roots) that are joined together instead of bound morphemes whereby a compound consisting of two members is treated as a sub-element in a larger compound. In short, such compounds are taken to be compounds within larger compounds. Consider the following example, followed by its bracketed representation:

(2) [raʔi:s lajnat l-ʔawbiʔah] lit. 'head-MSG committee-FSG the epidemics-FPL', 'Head of the Epidemics Committee'

By bracketing: [raʔi:s [lajnat-i l-ʔawbiʔah]] where the compound [lajnat l-ʔawbiʔah] is a compound within a larger compound which is [raʔi:s lajnat l-ʔawbiʔah].

The structure of such compounds is said to be complex. The structure of this compound can be represented in terms of branching as follows:

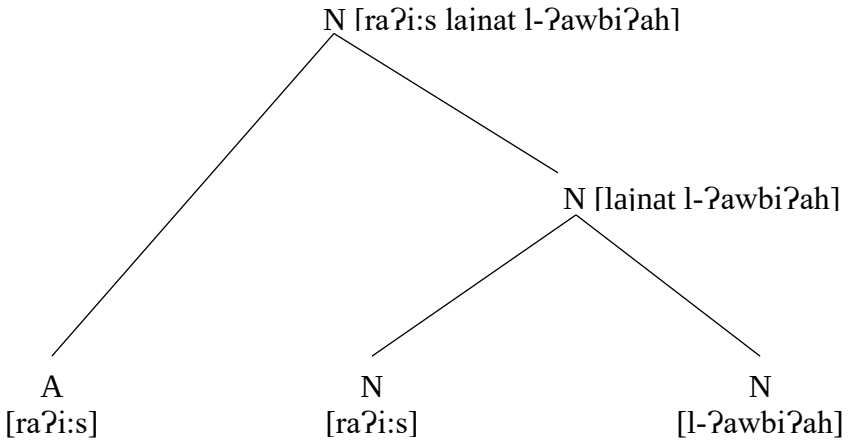

Figure 1. *Branching of [raʔi:s lajnat l-ʔawbiʔah]*

The branching of this compound shows that it consists of two immediate constituents where the two members [lajnat] 'committee' and [l-ʔawbiʔah] 'epidemics' are treated as a sub-unit of a larger compound [raʔi:s lajnat l-ʔawbiʔah]. Put differently, this compound consists of two immediate constituents, namely: the noun [raʔi:s] 'head' and the compound noun [lajnat l-ʔawbiʔah] 'the epidemics committee'. However, the first element [raʔi:s] 'head' is the head of the whole complex compound as it determines its meaning. It denotes a person (i.e., the head) who has something to do with the epidemics committee. Accordingly, this compound is a compositional compound. Such behavior refers to the fact that compositional compounds are recursive (cf. A. R. M. Altakhaineh (2019)).

The data analysis revealed that other newly created compounds have the same structure as presented in Figure 1. Consider another compound shown in Figure 2 with its bracketed and branching representation:

(3) [masʔu:l [khaliyyat l-ʔazama:t]] lit. 'officer-MSG cell-FSG crises-FPL', 'Crises Cell Officer'. A branching representation of this example is given in Figure 2 :

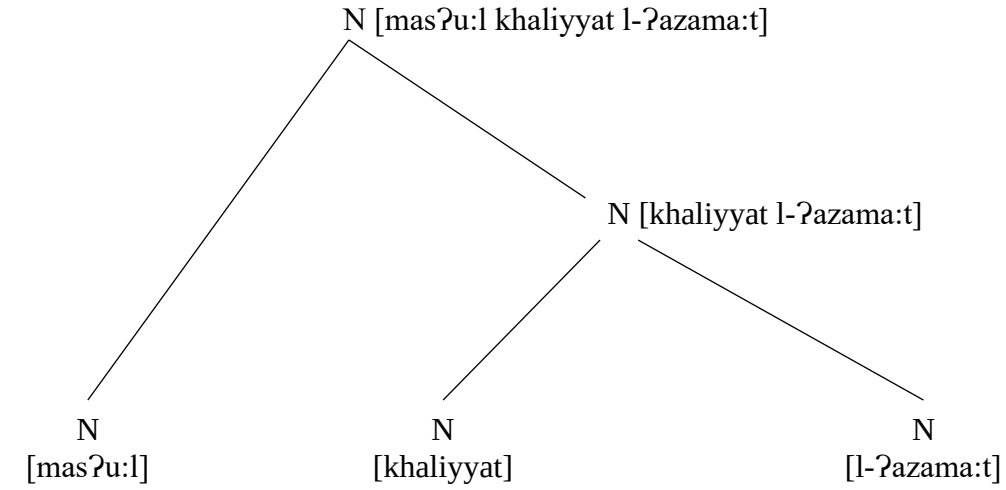

Figure 2. *Branching of [masʔu:l khaliyyat l-ʔazama:t]*

(4) [kharitat tari:q l-ˤawdah] lit. 'map-FSG road-MSG back-FSG', 'back roadmap'. A branching representation of this example is given in Figure 3:

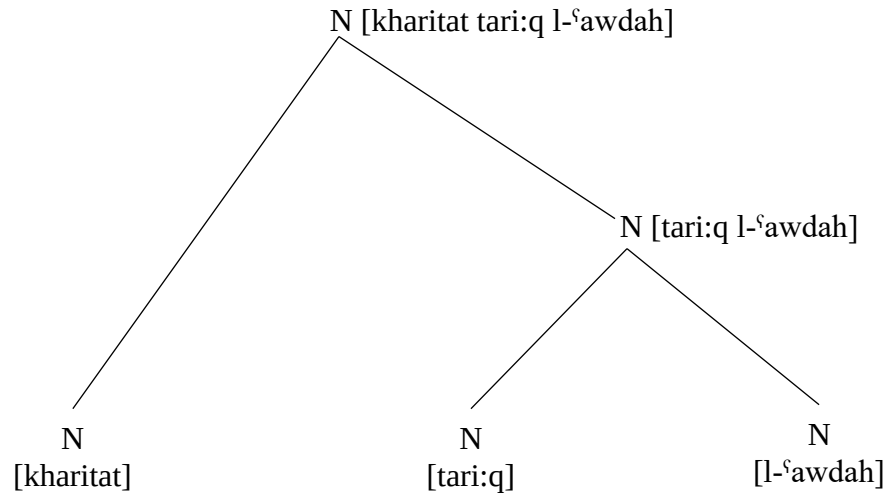

Figure 3. *Branching of [kharitat tari:q l-ˤawdah]*

The tree diagram in Figure 3 suggests that the noun [kharitat] 'map' is treated as the first sub-element of the more elaborated compound [kharitat tari:q l-ˤawdah] 'back roadmap' while the compound [tari:q l-ˤawdah] 'backroad' is the second sub-element. This refers to the fact that each compound must have only two immediate constituents (McCarthy, 2017). This elaborate compound noun refers to the preventive procedures followed by the Jordanian government when universities

and schools' students came back to the face-to-face learning after a long time of online learning. The following are further illustrative examples:

(5) [ʿudw lajnat l-ʔawbiʔah] lit. 'member-MSG committee-FSG the epidemics-FPL', 'epidemiology committee member'
(6) [mutala:zimat sh-sharq l-ʔawsat] lit. 'syndrome-FSG east-MSG middle-MSG', 'middle east syndrome'
(7) [mutahawwira:t fa:yrus ku:ru:na:] lit. 'variants-FPL virus-MSG corona-MSG', 'coronavirus variants'
(8) [luqa:h sbu:tnik layt] lit. 'vaccine-MSG sputnik-MSG light-MSG', 'sputnik light vaccine'
(9) [masʔu:l malaf ku:ru:na:] lit. 'administrator-MSG file-MSG corona-MSG', 'corona file administrator'

The instances in (5), (6), (7), (8), and (9) are complex newly created compounds in MSA as well. They are complex compounds that comprise three members; both the second and third elements constitute a compound within a larger compound. For example, in (5) [lajnat l-ʔawbiʔah] is a compound within the larger compound [ʿudw [lajnat l-ʔawbiʔah]]. Similarly, in (6) [sh-sharq l-ʔawsat] is a compound within the larger compound [mutala:zimat [sh-sharq l-ʔawsat]]. It is worth mentioning that compound (6) was used as a whole inside the phrase [[mutala:zimat sh-sharq l-ʔawsat] t-tanaffusiyyah] 'middle east respiratory syndrome' exhibiting that a lexis can form an element of a syntactic construction (cf. A. R. M. Altakhaineh (2019)).

However, the case of the compound in (7) is different. More specifically, the second and third elements of the complex compound, namely, [fa:yrus ku:ru:na:], can form a sub-element of the larger compound [mutahawwira:t fa:yrus ku:ru:na:]. It might sound appropriate to mention here that the second and third elements in (7) [fa:yrus ku:ru:na:] are borrowed from the English compound '*coronavirus'*. Borrowed words are changed to suit phonological, morphological, and syntactic patterns of the language in which they are integrated; they never possess the same version of the original ones (Palmer, 2008). Thus, the original copy '*coronavirus'* appears in MSA after borrowing as [fa:yrus ku:ru:na:]. The same compound can be used too as an instance of hybridization where the elements of the same compound belong to two different languages, namely, The English borrowed words 'corona' [ku:ru:na:] & *'virus'* [fa:yrus] and the Arabic one [mutahawwita:t] 'variants'. The whole compound is pluralized by pluralizing its head i.e., [mutahawwita:t] that carries the plural marker [-a:t] 'plural suffix-FPL'.

Similarly, compound (8) and (9) are complex compounds that comprise three members; e.g., the borrowed (i.e., Arabicized) elements in (8): [sbu:tnik layt] constitute a compound within a larger compound which is [luqa:h [sbu:tnik layt]], whereas in (9) only the third element [ku:ru:na:] is Arabicized which itself with the second element [malaf] 'file' constitute a compound within a larger compound that is [masʔu:l malaf ku:ru:na:]. It is essential to mention that four elaborate compounds, among the total number of the instances discussed under this section, were created as job titles for an executive purpose related to COVID-19 context, namely, (2), (3), (5), and (9).

Though complex compounding is already documented in the language (see, e.g., A. R. M. Altakhaineh (2019) Amer, 2010, p.13), the present study analyzed the internal structure of such newly created complex compounds in a novel way, by branching and bracketing, that is based on McCarthy's model (2017). It can be claimed that the outbreak of COVID-19 has activated such structures due to the new needs to name and describe the different aspects of this newly emerging disease. This reflects MSA's ability to cope with the newly emerging requirements and to keep up with the linguistic changes the pandemic has created.

To sum up, three types of newly created compound nouns that are related to the pandemic in MSA have been discussed in this study. These are compound nouns consisting of a noun followed by an adjective, those consisting of a noun followed by another noun, and those which were labelled as elaborate or complex compound nouns. The first two types were discussed in terms of their headedness, their internal syntactic structure, and their cross-linguistic criteria compliance, whereas the analysis given for third type was based upon Carstairs-McCarthy (2017) who states that "*a compound is a word and that compounds contain words*" (p.77). In other words, the structure of the previous newly created compounds in MSA can be used to support the idea that the structure of such complex compounds is like the structure of complex words, and they follow the same pattern. Complex words are created by attaching affixes, i.e., prefixes & suffixes, to the

root. Similarly, Complex compounds are created through joining multiple roots together where one element, i.e., the nucleus or the compound within a larger compound, functions like a root.

The above discussion indicates that most of these newly created compounds are coronavirus-oriented (i.e., they can be interpreted depending on coronavirus context). Although most of the words and terms that comprise such compounds are indeed existent in MSA, they sound novel during this time. It can thus be claimed that all these examples are pre-existing terms in MSA but they have acquired new usages at a time when most people in the Arab World are experiencing a 'stay-at-home order'.

2. Semantic Extension

Semantic extension refers to the phenomenon when a particular word acquires a new sense or a new technical meaning. This process takes place either to make this word stand as an equivalent to foreign technical terms (Al-Asal & Smadi, 2012), or to make this word express a newly added sense to the language itself. Accordingly, it can be claimed that adding new senses to existing words is the process of creating new lexemes. In the context of COVID-19, some existing lexical items of Arabic have acquired novel technical meanings. Table 5 includes three such instances:

Table 5. *Instances of semantic extensions*

No.	Words	Conventional Meaning	Novel Technical Meanings
1	[ʔama:n]	Safety	A mobile application has been developed for the Jordanian Ministry of Health (MOH). It helps keep the community and Jordan safe from coronavirus. It is used to alert users if they come into contact with a person infected with the virus. (AMAN - Aman.jo JORDAN APP COVID-19).
2	[sahtak]	Your health	A mobile application launched by the Jordanian Ministry of Health. It helps people to follow Corona news and to learn about ways to prevent the virus and how to deal with suspected cases (SAHTAK - Aman.jo JORDAN APP COVID-19).
3	[sanad]	Document	A mobile application used in Jordan allows the users to enter public and governmental institutions by showing their vaccination certificates.

Examples included in Table 5 explain how existing words of Arabic assign additional meanings (novel technical meanings) other than the conventional ones. It can be noticed that the new extensions of meaning are related in some way to the existing ones. For example, [taba:ʿud] 'distancing' is a mobile application that was developed for the Saudi Ministry of Health. This application sends notifications to the authorities when there are gatherings of more than 20 people who have installed this application onto their mobile phones. However, there are some cases of semantic narrowing that were noticed among the collected instances of semantic change which are [ja:ʔihah] 'pandemic' and [waba:ʔ] 'epidemic' that are used exclusively to refer to COVID-19, and not any other pandemic. Thus, their meanings were narrowed to be less general than their conventional meanings. In a nutshell, the motive to extend the meanings of the previous existing words is the need to name novel things or ideas in the context of COVID-19.

3. Borrowing

Borrowing is the process of duplicating a lexical item which formerly took a place in one language into a new one (Campbell, 2013). It comes as a natural result of the huge interaction among world languages. MSA is not an exception in this regard; it does borrow words from different languages especially the English language. English is perceived by most Arabs as the language of modernization, civilization, and scientific advancement (Al-Daher & Al-Haq, 2020). The data analysis revealed that some MSA words that are used in the context of COVID-19 qualify to be loan words, and thus fall under the category of borrowing. However, loan words or borrowed words can manifest in different forms in MSA: loan translations (or Calques), Arabicized words, and Hybridized words (cf. Hassan (2012)). The distribution of the different processes involved in the production of neologisms subsumed under the borrowing category is shown in Table 6.

Table 6. *The distribution of Borrowing processes*

	Category	Frequency	Percentages (%)
Borrowing	Loan Translation	3	18.8%
	Arabicization	5	31.2%
	Hybridization	8	50%
Total		**16**	**100%**

It is worth highlighting here that borrowed words do not usually maintain the original version of the source language, but they are altered to suit the patterns of the target language (Palmer, 2008). As far as MSA is concerned, a distinction can be made between borrowed words that undergo phonological modifications and those that undergo morphological modifications. If phonological changes are applied to the borrowed words, then the process of *Arabicization* is involved. If morphological changes, by contrast, are detected in the borrowed word, then the process of *Hybridization* is at play. These two subtypes of borrowed words together with calques (loan translations) are discussed separately in the upcoming three subsections.

i.*Loan Translation*

Loan translation (or Calquing) can be defined as the process of translating an expression from the source language directly or literally into the target language (i.e., the borrowing language) (Collins English Dictionary). In loan translation a multi-word expression is typically translated word-by-word. Zuckermann (2003) describes loan translation as a process that involves a semantic translation rather than being phono-semantic matching.

(10) [qina:ˤ l-wajh] 'face mask'
(11) [l-fahs s-sari:ˤ] 'rapid test'
(12) [t-taba:ˤud l-ʔijtima:ˤiy] 'social distancing'

The 10, 11 and 12 are examples of loan translations that are used in the context of COVID-19 in MSA. As for (10) [qina:ˤ l-wajh] 'face mask', notice that this expression is translated literally word-for-word: [qina:ˤ] = mask and [wajh] = face. However, the two expressions differ in terms of word order: the word 'mask' follows the word 'face' in the English version, but it precedes the word 'face' in the Arabic one. This observation can be straightforwardly accounted for in light of the structural differences between the source language (English in this case) and the target language (Arabic in this case). It is interesting to note here that there is a genuine Arabic synonym of the loan translated expression [qina:ˤ l-wajh] 'face mask' that is used in the same context, namely, the word [kamma:mah]. The word [kamma:mah] is derived according to the Arabic derivation system (root-pattern derivation). More specifically, it is derived from the root [k-m-m] on the pattern [faˤˤa:lah] that carries the semantic content (an instrument that carries out an action). Thus, it is a name of an instrument. Similarly, (11 and 12) are also regarded as loan translations, e.g., (11) [l-fahs s-sari:ˤ] is translated literally from the English expression *rapid test*. (12) [t-taba:ˤud l-ʔijtima:ˤiy] is a word-for-word translation of the English version *social distancing*.

ii.Arabicization

Conventionally, Arabicization is defined as the process of assimilating borrowed or translated words from foreign languages into Arabic (Ahmed & Nugdalla, 2017). It is also viewed as the process of transliterating foreign terminologies in order to fit the Arabic phonological and morphological rules (Al-Asal & Smadi, 2012). More precisely, Arabicization takes place when a borrowed term is used by Arabic speakers with some kind of modification in order to make it phonologically legal according to the phonological rules of Arabic. The data collected for the present study contained some instances which underwent the process of Arabicization. Table 7 lists some instances of Arabicized words that are used in MSA in the context of COVID-19.

Table 7. *Arabicized words*

No.	Transliteration	English
1.	[ku:ru:na:]	Corona
2.	[fa:yrus]	Virus
3.	[ku:fi:d]	COVID
4.	[karafa:n]	Caravan
5.	[brutuku:l]	Protocol

According to the examples shown in Table 7, these English words have been adjusted phonologically to fit the phonological system of Arabic. The phonological modifications applied to them involve two things: one, replacing some consonants of the original version of the words with their Arabic counterparts; and two, altering vowels. The first action of replacing some consonants of the original version of the words with their Arabic counterparts is since the phonemic system of Arabic lacks some consonants that are found in the phonemic system of English. This leads to replacing such missing consonants by other similar ones that are available in Arabic. The new consonants are normally like the English ones in the manner and place of articulation. They may differ in at least one dimension (e.g., voicing). For example, the English word 'virus' appears in Arabic as (2) [fa:yrus] and the English protocol appears in its Arabic version as (5) [brutuku:l]. This is ascribed to the fact that the phonemic system of Arabic lacks the voiced labiodental fricative /v/ and the voiceless bilabial stop /p/.

Thus, they are replaced by the most similar consonant in Arabic, that are, the voiceless labiodental fricative /f/ and the voiced bilabial stop /b/. The two consonants differ in voicing only. The same holds true in the English word *COVID* which is Arabicized as (3) [ku:fi:d] and *caravan* that is Arabicized as (4) [karafa:n]. It deserves to mention that COVID itself is a newly created word in English. Its usage coincided with the emergence of the pandemic. To be more accurate, COVID is an acronym which is created from the initial letters of '**co**rona**v**irus **d**isease'. It is worth mentioning that although the Arabicized version of *COVID* is represented orthographically as كوفيد [ku:fi:d] as the voiced fricative /v/ does not exist in the phonemic system of Arabic, some speakers of MSA (i.e., news presenters) pronounce *COVID* as [ku:vi:d] where /v/ in such case is a borrowed phoneme. Finally, the English word 'corona' is Arabicized as (1) [ku:ru:na:] where the alveolar approximant /r/ sound in the English word is replaced by a trilled [r] in the Arabicized version.

The second modification of altering vowels is since the vowels of the previous Arabicized words are longer than their counterparts in the original English words. For example, COVID is pronounced with long vowels in the Arabicized word (3) [ku:fi:d]. Furthermore, it can be noticed that some other vowels like the unrounded vowel schwa /ə/ in 'virus' ['vaɪrəs] are replaced by the rounded one /o/ in the Arabicized version (2) [fa:yrus]. Similarly, the diphthong /ai/ (i.e., [ay] in transliteration) is transferred legally into Arabic.

iii.Hybridization

The phenomenon of Hybridization occurs in MSA because of the immoderate borrowing of lexical items that have equivalents in MSA itself. Hybridization is defined as "an utterance that belongs, by its grammatical and compositional markers, to a single speaker, but that actually contains mixed within it two utterances, two speech manners, two styles, two 'languages,' two semantic and axiological belief systems" (Bakhtin (1981) cited in Hassan (2012)). The term Hybrid in linguistics refers to a word that is formed of different parts (i.e., morphemic, or sub-morphemic elements) that belong to two different languages. Accordingly, Hybridization is like blending in the sense that it involves joining two sub-morphemic elements. However, the difference between them is that, in the case of hybridization, one of the elements is borrowed from a foreign language.

An example of hybridization in MSA is the chemical word [khall-i:k] 'Acet-ic', where [Khal] 'vinegar' is a genuine Arabic stem and [-i:k] is an English borrowed sub-morphemic element (i.e., (-ic) part of 'acetic'). Some newly created compounds were found in the collected data and can be subsumed under this category. Table 8 lists some words and compounds that meet the criteria of being *hybrid compounds* because they are formed of words and/or word elements that belong to two different languages, namely: Arabic and English.

Table 8. *Instances of Hybridization*

	Transliteration	**English**
1.	[l-mutaḥawwir dilta:]	Delta variant
2.	[maṭʿu:m fayzar]	Pfizer vaccine
3.	[maṭʿu:m istrazinica:]	AstraZeneca vaccine
4.	[maṭʿu:m mudirna:]	Moderna vaccine
5.	[maṭʿu:m sinu:fa:rm]	Sinopharm vaccine
6.	[bru:tu:ku:l-a:t]	Protocols
7.	[fayru:s-a:t]	Viruses
8.	[karava:n-a:t]	Caravans

All the instances in Table 8 can be classified as hybridized words and compounds as they are all formed of two elements, one of which is borrowed or Arabicized, as shown in Table 8. The instance No (1) [l-mutaḥawwir dilta:] 'delta variant' is a newly created compound that is formed of the Arabic head noun [l-mutaḥawwir] 'variant' and the borrowed English word [dilta:] 'delta'. The first element of the instances (2), (3), (4), and (5), which is [maṭˁu:m] 'vaccine', is an original Arabic word, which constitutes the head of the whole compound, whereas the second elements, namely, [fayzer], [istrazinica:], [sinu:fa:rm], and [mudirna:] are borrowed words from foreign sources. Precisely, they refer to the names of manufacturers of vaccines that were used in Jordan during the crisis. The instances (6), (7), and (8) are hybridized words in which the bases [bru:tu:ku:l], [fayru:s], and [karava:n] have been borrowed from English, and then were pluralized by adding the original Arabic inflectional morpheme [-a:t] reflecting the number (i.e., plural) and the gender (i.e., feminine). It was found that such hybrid structures have been activated as a response to the new requirements to name new entities during the crisis.

DISCUSSION AND CONCLUSION

The spread of diseases and pandemics around the world is normally accompanied with the emergence of novel linguistic items. The outbreak of the Spanish flu in 1918 and Polio in 1911 as well as other epidemics have all been associated with new linguistic items in different languages. During the time of Black Death in the years 1346-1353, people started to put themselves in isolation to protect themselves from the disease, and the expression *self-quarantine* emerged. Similarly, new linguistic items related to more recent pandemics, such as SARS in 2003 and Swine flu (H1N1) in 2009, have also documented new linguistic terms. The outbreak of coronavirus (COVID-19) is not an exception in this regard in the sense that it was clearly associated with many newly created words (i.e., neologisms) which were formed through different word-formation processes.

The present study examined the behavior of MSA when exposed to new requirements and needs as a result of the world status quo (i.e., the emergence of COVID-19). More specifically, this study explored the different linguistic processes that were employed in MSA to meet such novel needs. The present study differs from other studies that investigated COVID-19 neologisms in English (e.g., (Akut, 2020; Asif et al., 2021; Khalfan et al., 2020; Saleh, 2021)). Unlike the previous studies, this study attempted to explore the morphological and semantic behavior of COVID-19-related neologisms in MSA. The findings of the current research support the idea that linguistic creativity and productivity is a universal characteristic of language that is a response to world societal changes.

The present study also focused on MSA rather than Jordanian Arabic (JA). This refers to the fact that the instances of the study were collected from the news reports of Al-Mamlakah TV, during the COVID-19 crisis, that uses MSA instead of the colloquial varieties. However, JA is not an exception in this regard where the COVID-19 crisis has many linguistic impacts on JA that should be discussed in a separate research paper. Generally, the morphological implications of the crisis on JA may not vary from these discussed in the present study where many neologisms have entered JA. We can suggest that all the instances of MSA discussed in the present study have entered JA via the same word-formation processes but with some phonological variation, for example, [manṭiqat-u ˁazl] 'isolation area' and [qa:nu:n-u difa:ˁ] 'defense law' in MSA are [manṭigat ˁazil] and [ga:nu:n difa:ˁ] in JA. Thus, there is no real difference at the level of structure or meaning. However, the phonological representation of them varies according to the phonological rules of JA, and case markers at the ends of MSA words disappear in the JA versions. Undoubtedly, JA exhibits further morphological processes when exposed to the COVID-19 crisis, like derivation. For example, [ku:ran] is a past tense verb derived from the Arabicized word [ku:ru:an:] 'corona'. It is derived following the root-pattern system of Arabic, that is a non-concatenative system, by applying the verbal pattern of Jordanian Arabic [f-u:-ˁ-a-l] on the Arabicized root [k-r-n]. Other instances of Jordanian Arabic derivational behavior such as [mku:rin] 'someone (male) who has COVID-19'.

Based on the analysis above, the word-formation processes followed to create COVID-19-related neologisms were discussed separately, However, it is worth mentioning that multi-word-formation processes take place when neologisms are created. The findings characterize two kinds of multi-word-formation processes, which are compounding + Arabicization, and hybridization +

Arabicization. As for compounding + Arabicization such as Table 4 N+N compounds (17-19) and Table 8 Hybridization (2-5) where one element of these compounds, in Tables (4 and 8), is an Arabicized version of a foreign (i.e., English) word. Although only two word-formation processes are involved in the creation of these compounds, they can be listed under multi-word-formation processes instead of dual-word-formation processes as compounding + Arabicization, which produces the so-called hybridized compounds. Hence, compounding + Arabicization = hybridized compounds whereas the second type which hybridization + Arabicization is regarded as a dual-word-formation process as shown in Table 8 (6-8) that are hybridized words created by attaching Arabicized bases to original Arabic inflectional suffixes.

The data necessary for the purposes of the current study was collected from the news reports of Al-Mamlakah TV, as being the most viewed channel in Jordan, during the crisis from March 10, 2020, to July 15, 2021. The data analysis revealed that the majority of the collected instances were nouns, a finding that gave further credit to the theory of onomasiology of Štekauer (1998) which draws on naming the novel needs of a speech community. The data analysis also showed that these novel nouns (i.e., neologisms) in MSA are created through a suite of morphological processes such as compounding, semantic extension, loan translation (or calquing), Arabicization, and hybridization (where the last three processes are all subsumed under the umbrella of borrowing).

The validity of the linguistic data used in the present study stems from the fact that most of the neologisms collected and used in the present study have been used on the Arabic website of (WHO, 2021) as adequate Arabic equivalents. Precisely, the source of data (e.g., Al-Mamlakah TV news reports) takes COVID-19 information from the Arabic version of the WHO website and similar websites that provide information and advices about COVID-19 in Arabic like (Fairfax County), in addition to COVID-19 glossaries that provide an Arabic version of COVID-19 medical terminology like (NSW Government). Thus, it is to suggest that these neologisms are accepted while they fulfill their communicative function across a language as they became a part of the scientific literature corpus and are authenticated by the WHO.

It is important to mention that COVID-19 related neologisms have been acquired by MSA gradually during the crisis (i.e., MSA has created these neologisms according to the emergence of the new requirements imposed by the pandemic). The internal morphological and syntactic structure of newly created compounds in MSA is thoroughly investigated to uncover their headedness as well as the relationship between their members. As for N+Adj and N+N compounds, they were discussed with a reference to the cross-linguistic criteria to identify such compound constructs. It was found that N+N compounds exhibited a higher degree of productivity than N+Adj compounds. Two new compound types in MSA were identified, namely, the N+A metaphoric compound in which the non-head adjectives denoted metaphoric meaning rather than a literal or direct meaning, and N+N hybridized compounds that are formed of elements that belong to two different origins (i.e., languages). The internal structure of newly created complex compounds was also discussed with special focus on the relationships between their members and their headedness, and they were analyzed on a bar with Carstairs-McCarthy (2017). Semantically, all compound types analyzed above are compositional compounds.

It is important to mention that many COVID-related terms discussed in this paper are not exclusively novel terms. They are pre-existing terms that have either acquired new resonance or collocated with other pre-existing ones to create novel linguistic artifacts (i.e., compounds) to get novel meanings. For example, the elements of Table 4 (9) [manassat-u s-safar] 'travel platform' are pre-existing terms that were joined to produce a new word (i.e., compound) with a new meaning that is COVID-related meaning. It was found that the meanings of such compounds can be interpreted based on the societal and global changes that took place from the beginning of the crisis (i.e., they have context-dependent meanings).

Although many newly created words related to the pandemic in MSA have not entered the Arabic dictionary yet, MSA has succeeded in keeping up with the linguistic changes which the pandemic created. The innovative neologisms found in MSA during this exceptional time reflect their ability to cope with the newly emerging requirements, contrary to what lots of people believed. Finally, it remains to be seen whether new words are still created in different languages daily in order to meet the new needs and events that ensue as a result of the crazy developments of COVID-19. For example, the world started lately talking about novel variants of the pandemic, new

medicines and vaccines, and expectations of new diseases. It is recommended that researchers in the field of linguistics investigate and record these newly created linguistic items, as novel linguistic artifacts will undoubtedly be created. It is also recommended to investigate the linguistic behavior of newly created linguistic items in Jordanian Arabic (JA).

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APPENDIX

Transliteration of Arabic letters

Note: *gemmination* takes place by reduplication of same sound.

l	ل		ʔ	ء
m	م		b	ب
n	ن		t	ت
h	ه		th	ث
w	و		j	ج
y	ي		ḥ	ح
a	Short vowels		kh	خ
i			d	د
u			dh	ذ
a:	Long vowels		r	ر
i:			z	ز
u:			s	س
aw	Diphthongs		sh	ش
ay			ṣ	ص
			ḍ	ض
			ṭ	ط
			TH	ظ
			ʿ	ع
			gh	غ
			f	ف
			q	ق
			k	ك