A MORPHOLOGICAL ANALYSIS ON ENGLISH COMPOUND WORDS IN THE SELECTED ARTICLES OF BBC NEWS

THESIS

Written by:

Kurinta Septi Dwi Rahayu
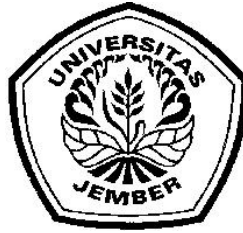
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ENGLISH DEPARTMENT

FACULTY OF LETTERS

JEMBER UNIVERSITY

2016

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Presented as one of the requirements to obtain S1 Degree

at English Department, Faculty of Letters

Jember University

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DEDICATION

This thesis is dedicated to:

1. My beloved father Sabar Santoso and my beloved mother Sri Ngatmiati who have given me full support, motivation, endless prayers and time for having shared to give some suggestions in the process of finishing my thesis. I am so thank God to have you as my parents,

2. My dearest sister Kurnia Ejuni Eko Cahyu, S.Pd for your support, understanding, and helping me to find the references for my thesis and Tri Novan Agung Kurniadi for your patience and understanding to have a sister like me. It is the grateful thing to have siblings like you.

MOTTO

"Language is infinitely modifiable and extendable. Words go on changing
meanings and new words continue to be added to language
with the changing needs of the community using it."

(Jindal, 2007:3)

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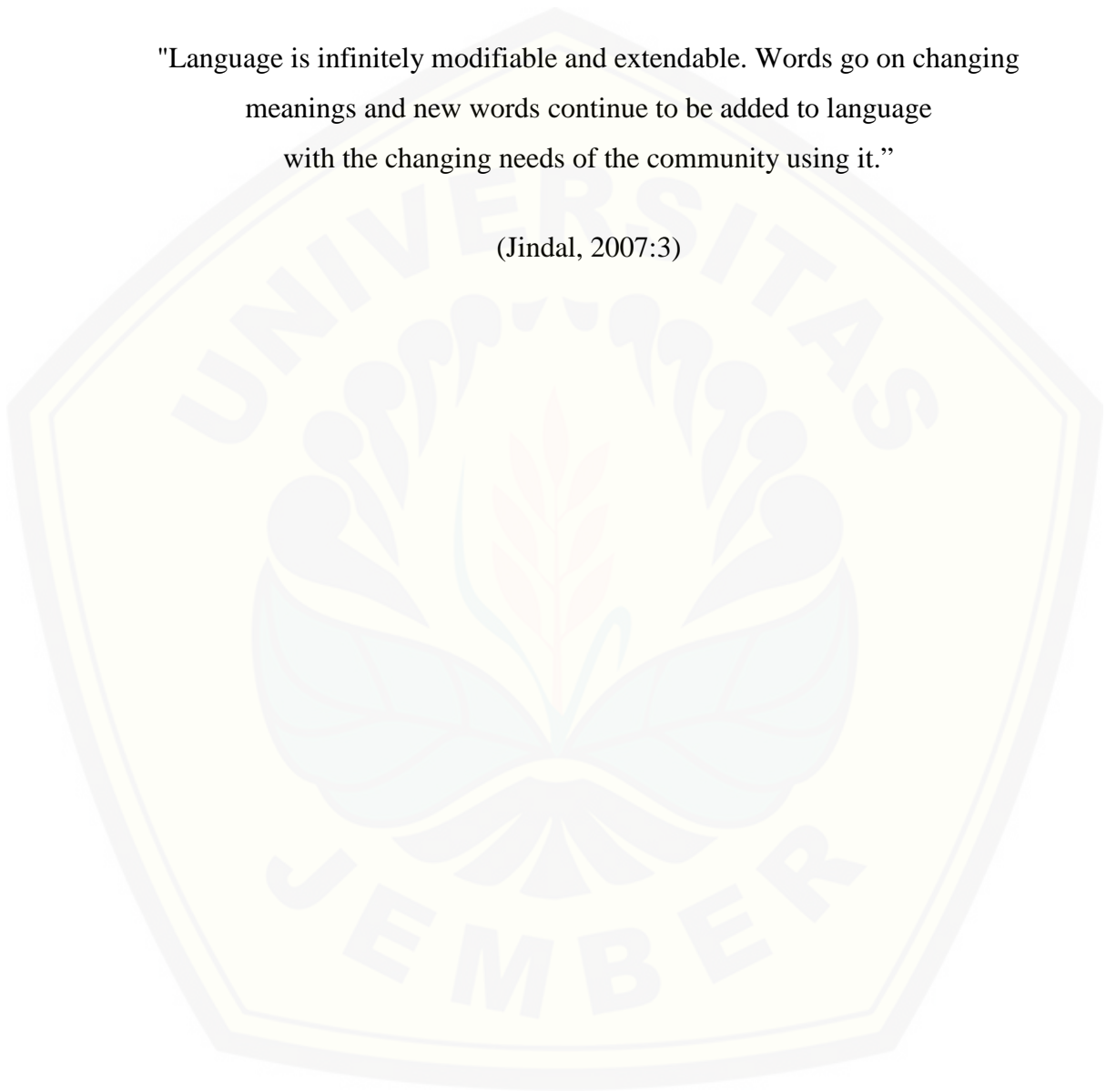
*) Jindal, D.V. 2007. *An Introduction to Linguistics, (2nd Edition)*. New Delhi:
Prentice Hall of India.

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DECLARATION

I hereby state that the thesis entitled "*A Morphological Analysis on English Compound Words in the Selected Articles of BBC News"* is an original piece of writing. I declare that the analysis and the research described in this thesis have never been submitted for any other degree or any publication.

I certainly certify to the best of my knowledge that all sources used and any help received in this preparation of this thesis have been acknowledged.

Jember, May 2016

The Researcher

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SUMMARY

A Morphological Analysis on English Compound Words in the Selected Articles of BBC News; Kurinta Septi Dwi Rahayu; 100110101066; 2016; 50 pages; English Department; Faculty of Letters; Jember University.

The joining of two words or more can express new meanings when they are written separately, as a one word, or hyphenated. A word may also have different meanings when it is added by some affixes. This process happens in word-formation processes. Yule (2010) classifies word-formation processes into ten: coinage, borrowing, compounding, blending, back-formation, conversion, acronyms, derivation, and multiple-processes. This research discusses compounding as a part of word-formation processes. This topic is chosen because English compound words have specific characteristics in their morphological aspects, such as the types of compounds, the orthographic features of compounds, and the meanings of compounds. The selected articles are chosen because a lot of formations of English compound words are not written in simple way but more complex.

To investigate the data, the researcher uses qualitative research. There is one tool to collect the data. It is documentary study. The basic data of this thesis is English compound words. English compound words are taken from the selected articles of BBC news from *www.bbcnews.com* website. This research is specifically focused on the morphological analysis of compound words by analysing the compounds from the patterns of the constituents and their internal structures of the words. First of all, the researcher classifies the types of compounds. In total, there are 201 compounds from five selected articles. There are five types of compounds from eight types of compounds based on Bauer's theory (1983). They are 171 compound nouns, eighteen other form classes, six compound verbs, three compound adjectives, and three neo-classical compounds.

The result shows that most of compounds in the selected articles have grammatical heads in the right hand elements and modifiers in the left hand elements. The right hand elements mostly determine the word classes of the whole compounds.

Next, the compounds are described about their orthographic features and the meanings of English compound words in the selected articles of BBC news. There are 141 compounds are written separately, forty two compounds are written as a one word, and ten compounds are hyphenated. When the compounds are complex and longer, the compounds tend to be written separately rather than as a one word or hyphenated. There are 155 compounds with endocentric meanings and forty six compounds with exocentric meanings. Compounds with the grammatical heads in the right hand elements are classified as endocentric compounds. When the first and the second elements do not specify the meaning of the whole compounds, they are classified as exocentric compounds. Compounds which are written as a one word tend to be classified as exocentric compounds. Whereas compounds which are written separately, tend to be classified as endocentric compounds. The learners should consider the elements in constructing the compounds itself from the patterns of the types, the orthographic features, and the production of meanings of compounds to comprehend English compound words.

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CHAPTER 1. INTRODUCTION

There are several ways for understanding some morphological aspects of English compound words. One of them is by analysing the formation of the words in the articles. This chapter explains further about the topic of this study which concerns with the analysis of English compound words in the selected articles of BBC news. It also presents some parts that cover the introduction of the study, the background of the study, the scope of the study, the research problem, the research questions, the goals of the study, the significances of the study, and the organization of the study.

1.1 The Background of the Study

Morphology as one of the most important studies in linguistics is very important for students as English learners. It studies about how the words are built up from the smallest pieces. Understanding the formation of those words is very useful for the learners since English is considered as the foreign language in Indonesia. The learners learn the words and try to know how to use and organize them. This process is a part of morphological process in English. The morphological process of English teaches English learners the rules for forming new word such as verb, noun, adjective, adverb becoming other word classes. Through this morphological process, the formation of new word from another word classes is done by putting affixation to the existing word, for example the noun form of *friend* becomes the adjective form *friendly* by adding suffix *-ly*.

Moreover, in Morphology, the term word-formation is used when new words are created and become part of the language. Word-formation is a process which produces a new word with a new meaning. There are ten types of word formation in English (Yule, 2010:58). Those are coinage, borrowing,

compounding, blending, back-formation, conversion, acronyms, derivation, and multiple-processes. Knowing those help the learners to have better understanding in English language. However, this study only concerns with English compound words.

According to O'Grady and Guzman (1996:143), one type of morphological processes in language is termed compounding. "It is defined as combination of some lexical categories such as adjectives, nouns, verbs, or prepositions in purpose of constructing a larger unit of word". This study analyses English compound words based on their morphological aspects. The morphological aspects are the types of compound words, the orthographic features of compound words, and the meanings of compound words. The compound words are also identified from the internal structure of the constituents.

Hundreds of examples of English compound words can be found both in spoken and written materials. The spoken and written materials are the sources of word formation process in which compound words are easily found, such as dialogues, speeches, newspapers, magazines, and others. This study uses the written material as the source of the study by selecting articles of BBC news from its website. BBC news from its website is one of the most popular sites in the world. The website is very up-to-date to the most recent incident or event around the world. The written language in the website has been adapted for the readers who have high proficiency in English. As the readers of BBC news in Indonesia, the articles will be a good learning source for English learners to find and comprehend English compound words deeper.

In this study, the selected articles are chosen because a lot of formations of English compound words are not written in simple way but more complex. When English learners want to find English compound words in the selected articles, they also have to concern with the producing of a single meaning from the joining of two words. Hence, this study will give benefit for English learners to have better understanding both in the various formations of English compound words and also the whole selected article.

1.2 The Scope of the Study

This study deals with the morphology study especially the morphological analysis of English compound words. This study is categorised in the word-formation scope because word-formation itself explains the formation of derivation and compound words. Compound words deal with production of new words more than one root. This topic is worth researching especially in the selected articles of BBC news to understand the morphological aspects of English compound words when some English learners read the selected articles.

1.3 Research Problem

BBC news from its website is one of learning sources for English learners that can be accessed easily. Reading the articles give some benefits for English learners. One of the benefits is enriching their vocabularies. The selected articles in this study contain a lot of formations of English compound words which are written in complex structures. The complex structures are analysed based on the types, the orthographic features, and the meanings of English compound words.

1.4 Research Questions

Based on the background of the study, this study intends to answer the following questions:
1. What types of English compound words can be found in the selected articles of BBC news?
2. How can the orthographic features and the meanings of English compound words be described in the selected articles of BBC news?

1.5 The Goals of the Study

The goals of this study are explained as follows:
1. To find out the types of English compound words in the selected articles of BBC news,
2. To analyse the orthographic features and the meanings of English compound words in the selected articles of BBC news.

1.6 The Significances of the Study

Based on the problems of the research and the goals of the study mentioned above, the significances of this study are:

1. The result of this study proposed as the additional knowledge for those who are interested in studying English compound words,

2. The result of this study is expected to be a reference in applying English compound words in the learning process of English (speaking and writing).

1.7 The Organization of the Study

This study contains five chapters. The first chapter is the introduction that consists of the background of the study, the scope of the study, the research problem, the research questions, the goals of the study, the significances of the study, and the organization of the study. The second chapter is the literature review and the theoretical framework which consist of the review of the previous researches and the review of the related theories, also the theoretical framework. The third chapter is the research design and methodology which consists of the type of the research, the research strategy, the data collection, the data processing, and the data analysis. Then the fourth chapter is the research findings and discussion of this research, and the last chapter is the conclusion of the research.

CHAPTER 2. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

The analysis of this study needs some theories and references as the basis for operating the selected articles. This chapter contains the explanation of the theories and the references applied in this study. It reviews some previous researches which discuss about word-formation processes. Because the focus of the study is morphology, this chapter explains precisely some terms related to the morphology. This chapter describes the definition, the types, the orthographic features, and the meanings of the English compound words. This chapter also presents the framework of the study to analyse the formation of English compound words in the selected articles.

2.1 The Review of the Previous Researches

There are three previous researches that support and contribute to this study. Those researches are about word-formation as a part of morphology study. The first research was conducted by Jovanovic (2005). The research investigated the main formal characteristics of English compound words in the adjectival positions, systematized, and based on the language corpus. The data were taken from two novels and works in the literary criticism, psychology, sociology, and history. The theory of modern English word-formation by Adams (1976) was used in this research. The research showed that the typical English adjectival compound would be the one with a noun as the first and past participle as the second element of the compound.

The second research was done by Rakic (2009). The research observed the structure, the type frequencies and the spelling of English compound nouns on the basis of a corpus extracted from LDCE (2000). The theory of the spelling of

English compound words by Jespersen (1942) was used in this research. The research found that the compound types which are easier to process are more often spelled solid. According to the proposed analysis of English compounds, solid compounds seem to differ from open compounds in four important features: spelling, morphological structure, type frequency and productivity.

The third research was conducted by Hadiati (2011). The research examined English compound words, precisely endocentric compound in the selected short story from Tolstoy (1828-1910). The theory of English compounding by Katamba (1993) and O'Grady (1996) were used in this research. The research showed that endocentric construction was more productive than exocentric. The data showed sixty compounds were endocentric compounds.

Those previous researches give great contributions to this research in terms of morphology theories and some references related to the word-formation processes which can help to do the current research easier. All the previous research discuss about English compound words and this research does too. The first and second previous research use the corpus analysis but this research does not use corpus for analysis. The first previous research observes English compound words in the adjectival position whereas the second previous research focuses on the English compound nouns. However, this research focuses on all the types of English compound words. If the third research only describes the meaning of English compound words based on the endocentric construction, this research focuses on the endocentric and exocentric constructions also the source of the data is different. This research takes the data from the five selected articles of BBC news not from the short story. In the end of the research, the learners hopefully can comprehend English compound words well by considering three morphological aspects of compounds. The morphological aspects are the types, the orthographic features and meanings of compound words.

2.2 The Review of the Related Theories

This sub-chapter has an important role in conducting the study because it consists of the theories that support the investigation of the study. It provides

several theories related to the morphology studies, including some definitions of morphology, some terms related to morphology, the definition of compounding, the types of English compound words, the orthographic features of English compound words and the meaning of English compound words.

2.2.1 The General View of Morphology

As a part of linguistic study, morphology has a lot of definitions from some linguists. According to Bauer (1983:13), "morphology as a sub-branch of linguistics deals with the internal structure of word-forms". Some other linguists like Katamba (1993:3) says that "morphology is the study of the internal structure of words". While, Nida (1949:1) says that "morphology is the study of morphemes and their arrangements in forming words".

In addition, based on some quotations above, it can be concluded that morphology is a part of linguistic study that concerns with how the words are formed. It studies how words are put together from the smallest meaningful units and the rules governing this process. The main point of studying morphology is identifying morphemes and their distributions and combinations in forming words.

Morphology is divided into two main branches; they are inflectional morphology and word-formation. Inflectional morphology deals with forms of individual lexemes. The other branch of morphology is word-formation. According to Bauer (1983:34), "word formation deals with the formation of new lexemes". Word-formation is generally divided into two main groups; they are the predictable and unpredictable formations (Bauer, 1984:201-240). The predictable formations include affixation (derivation), compounding, back-formation, and conversion whereas the unpredictable formations include clipping, blending, acronyms, word manufacture, and mixed formations.

2.2.2 Morphemes

A morpheme as the smallest part of words cannot be broken down into small part again. According to O'Grady and Guzman (1996:133), "a morpheme is

the essential unit in word construction, the smallest meaningful component of language which conveys message containing meaning or function". Morpheme is used to refer to the smallest invisible unit of semantic content of grammatical which word is made up of, for examples :

a. The word *books* consists of two morphemes *book + -s* which indicate a noun and the plural marker,

b. The word *lovely* consists of two morphemes *love + -ly* which indicate an adjective form from a noun base of "love",

c. The word *talks* consists of two morphemes *talk + -s* which indicate a verb and *-s* is the marker that the subject is the third singular person in the simple present tense.

Morphemes are usually subdivided into some categories again. The categories are presented in the figure 2.1 below.
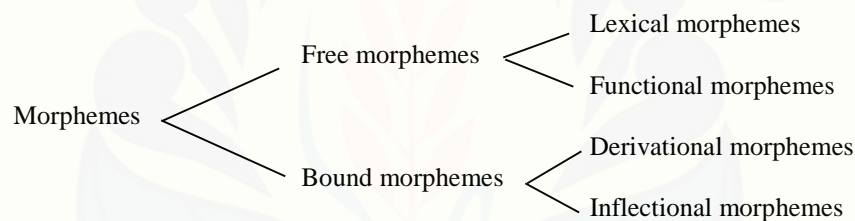
Figure 2.1 The different categories of morphemes by Yule (2010)

2.2.2.1 Free and Bound Morphemes

McCarthy (2002: 18-20) states that there are two kinds of morphemes; they are bound morphemes and free morphemes. "Morphemes that can stand alone on their own are called free morphemes, and ones that cannot are bound morphemes". In the form *whiteness*, the free morpheme is *white* and the bound morpheme is *-ness*.

2.2.2.2 Lexical and Functional Morphemes

According to Yule (2010:68-69), free morphemes divided into two types; lexical and functional morphemes. "Lexical morphemes are set of ordinary nouns, adjectives and verbs that as the words they can carry the content of the messages, for examples *boy, loud, follow, etc*". Other types of free morphemes are called

functional morphemes. These morphemes consist of the functional words in the language such as conjunctions, prepositions, articles and pronouns, for instances *and, on, near, above, in, the, that, it, them*, etc.

2.2.2.3 Inflectional and Derivational Morphemes

According to Yule (2010:69), bound morphemes divided into two types; inflectional and derivational morphemes. "Derivational morphemes are a set of bound morphemes used to make new words or to make words of a different grammatical category from the stem". For example, the addition of the derivational morpheme *-y* changes the noun *cat* to the adjective *catty*.

Other types of bound morphemes are called inflectional morphemes. These morphemes are used to indicate aspects of the grammatical function of a word. Inflectional morphemes are used to show if a word is plural or singular, if it is past tense or not, and if it is a comparative or possessive form. According Yule (2010:69-70), English has only eight inflectional morphemes (or inflections): nouns + *-'s, -s*, verbs + *-s, -ing, -ed, -en*, adjectives + *-er, -est.*

2.2.3 Roots, Stems, and Bases

In Morphology, there are three elements of word that need to be known. The three elements are root, stem, and base. All terms are used to remain when all affixes have been removed. According to Bauer (1983:20), "a root is a form which is not further analysable, either in terms of derivational or inflectional process". This term remains when all inflectional and derivational affixes have been removed. The word of *untouchables* as a noun is used here to find the root, stem, and base. *Untouchables* is the lowest caste in India (*http://www.thefreedictionary.com/untouchables*). In the form of *untouchables*, the root is *touch*, first the suffix *-able*, then the prefix *un-*, and finally the suffix *-s* have been added (see Figure 2.2).
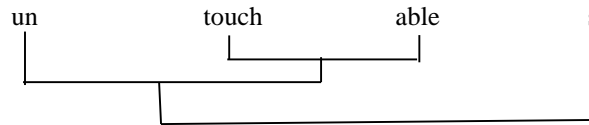
Figure 2.2 The way how to form the word *untouchables*

Still in Bauer's, he notes that a stem only deals with inflectional morphology (1983:20). Inflectional (but not derivational) affixes are added to it. This term remains when all inflectional affixes have been removed. In the form of *untouchables*, the stem is *untouchable* (see Figure 2.3).
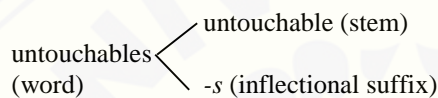
Figure 2.3 The way how to find the stem from the word *untouchables*

Then, "it is labelled as a base when any form to which affixes of any kind can be added. Any root or any stem can be termed as a base, but the set of bases is not formed by the union of the set of roots or set of stems" (Bauer, 1983:21). In the form of *untouchables*, the bases are *touchable*, *untouchable* (see Figure 2.4).
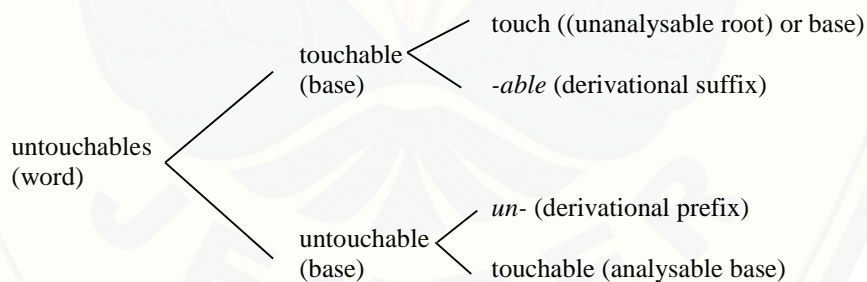
Figure 2.4 The way how to find the base from the word *untouchables*

2.2.4 English Compound Words

There are many ways of creating new words in English. They are coinage, borrowing, compound, blending, back-formation, conversion, acronyms, derivation, and multiple-processes (Yule, 2010:58). One of the ways is compounding. According to Plag et al. (2009:99), "all words which are formed by

combining two or more words to form a new word termed as compounding". Following are the examples of compound words;

Compound words	Word-class of elements	Word-class of the whole compound
glasshouse	noun + noun	noun
colour-blind	noun + adjective	adjective
small talk	adjective + noun	noun
deep-fry	adjective + verb	verb

From those examples above, it shows that the word-class of the compound is the same with the word-class of the right hand element. The right hand element not the left hand element determines the word class of the whole compound. In short, compounds have one element that is semantically and grammatically more important than other elements called the head of a compound (Plag et al., 2009:102). In English compound words, the head is usually the right-hand element as in the examples above.

Before going further to the next section, following is the distinction between phrases and compound words.

Table 2.1 The examples of distinction between phrases and compounds

No	Phrases	Compound words
1	*black board*	*bláckboard*
	(board that is black)	(board for writing on)
2	*hair nét*	*háirnet*
	(net made of hair)	(net for covering hair)
3	*white hóuse*	*(the) Whíte House*
	(house that is white)	(residence of the US President)

Source: McCarthy (2002)

First, there is the difference in the sound corresponding to the difference in meaning. The stress vowel is indicated by an accent. Compound words are regularly stressed on the left-hand element. However, there are also some compounds that are stressed on the right-hand elements. For example, compounds whose first element indicates a location or material (as in *Boston hárbour, silk shírt*) are often stressed on the right-hand element. (Plag et al., 2009:100). The second criterion used for distinguishing compounds from phrases is semantic. A

compound tends to have a meaning that is more or less idiosyncratic or unpredictable.

There are three steps to analyse the English compound words. The first step classifies the types of English compound words. The second step categorises the orthographic features of English compound words. The third step describes the meanings of English compound words. All steps are explained in the following section.

2.2.4.1. The Types of English Compound Words

Following Bauer (1983:202-216), compound words can be divided into eight types namely compound nouns, compound adjectives, compound verbs, compound adverbs, other form classes, rhyme-motivated compounds, ablaut-motivated compounds, and neo-classical compounds.

a) Compound nouns

Compound nouns have a noun as the rightmost element. Most English compound nouns are right-headed, but not all, as in the patterns 3, 4, 8, 9. The complete patterns of English compound nouns by Bauer are presented in the following table.

Table 2.2 The patterns of English compound nouns

No	Patterns	Examples
1	noun + noun	boy-friend, manservant, woman doctor
2	verb + noun	cut-throat, kill-joy, pickpocket
3	noun + verb	nosebleed, sunshine, birth control
4	verb + verb	make-believe
5	adjective + noun	fast-food, hard-stuff, software
6	particle + noun	afterheat, in-crowd, off-islander
7	adverb + noun	now generation
8	verb + particle	cop-out, drawback, throughput
9	phrase compounds	love-in-a-mist, bubble-and-squeak.

Source: Bauer (1983)

b) Compound adjectives

All the compounds in the patterns number 1 - 4 are right-headed. There are also a few compound adjectives that are not right-headed as in the patterns 5 - 8. The complete patterns of English compound adjectives by Bauer are presented in the following table.

Table 2.3 The patterns of English compound adjectives

No	Patterns	Examples
1	noun + adjective	capital-intensive, childproof, leadfree
2	verb + adjective	fail safe
3	adjective + adjective	double-helical, open-ended, ready-made
4	adverb + adjective	over-qualified, uptight
5	noun + noun	coffee-table (book), glassteel (sky-craper)
6	verb + noun	break-bulk, roll-neck
7	adjective + noun	broad-brush, grey-collar, red-brick
8	particle + noun	before-tax, in depth
9	noun + verb	-
10	verb + verb	go-go, pass-fail, stop-go
11	adjective/adverb + verb	high-rise, quick-change
12	verb + particle	see-through, tow-away, wrap-around

Source: Bauer (1983)

c) Compound verbs

Compound verbs have a verb as the rightmost element. Most English compound verbs are right-headed, but not all, as in the patterns of English compound verbs by Bauer number 2, 6, 7. The complete patterns of English compound verbs by Bauer are presented in the following table.

Table 2.4 The patterns of English compound verbs

No	Patterns	Examples
1	noun + verb	blockbust, carbon-date, colour-code
2	verb + noun	shunpiker
3	verb + verb	make do, dare say
4	adjective + verb	double-book, fine-tune, soft-land
5	particle + verb	outachieve, overachieve, overbook
6	adjective + noun	brown-bag, bad-mouth
7	noun + noun	to breath-test

Source: Bauer (1983)

d) Compound adverbs

The most common way of forming compound adverbs is by suffixation of -*ly* to a compound adjective. Other examples are double-quick, flat-out, flat-stick.

e) Rhyme-motivated compounds

In these compounds, the rhyme between the two elements is the major motivating factor in the formation. Rhyme is correspondence of sound between words or the endings of words, especially when these are used at the ends of lines of poetry (http://www.oxforddictionaries.com/definition/english/rhyme). The examples are gang-bang, stun-gun, brain-drain.

f) Ablaut-motivated compounds

These compounds involve ablaut. Ablaut is alteration in the vowels of related word forms, especially in Germanic strong verbs (e.g. in sing, sang, sung) (http://www.oxforddictionaries.com/definition/english/ablaut). Another examples are flip-flop, zig-zag, riff-raff.

g) Neo-classical compounds

The vocabulary of English, especially in scientific and technical areas, includes compounds that are made up of bound roots. It is known as combining forms, for instances anthropology, sociology, cardiogram, electrocardiogram, retrograde, retrospect, plantgrade. For most of these, the meaning of the whole is clearly determinable from that of the parts: for example, anthrop(o)- 'human' plus -(o)logy 'science or study' yields a word that means 'science or study of human beings'.

h) Other form classes

Other form classes include compound prepositions, compound pronouns, and compound conjunction. The examples of those compounds are compound prepositions include onto, into, and because of, compound pronouns are -*self* forms and somebody, anyone, etc, and compound conjunction include whenever, so that.

2.2.4.2 The Orthographic Features of English Compound Words

One of the important features of English compound words is their variable orthography. According to Plag et al. (2009), there are three ways of spelling English compound words. Some compounds are written as one words (as in *ashtray, windmill*). Others are written separately (as in *income tax increase, education minister*) and one group of compounds are written with a hyphen (as in *fast-food, icy-cold*). However, there are no specific rules of compound orthography in English.

More in Plag et al. (2009), "one important determinant of the spelling is frequency of occurrence. Compounds that are infrequent are unlikely to be spelled as one word or to be hyphenated."

2.2.4.3 The Meanings of English Compound Words

Based on the semantic criteria, there are two types of compound words. They are exocentric and endocentric compounds (McCarthy, 2002:64-65). The same idea is stated by O'Grady and Guzman (1996:154-155). The complete explanation is described as follows:

1. Exocentric compounds

The meaning of compound does not follow from the meaning of its parts in this way (in a smaller number of cases). The word class of these headless compounds is not determined by any element inside them (that they have no internal centre), for examples:

a) greenbottle is not a type of bottle; rather, it is a fly of the genus lucilia,

b) redneck is not a type of neck but an ultraconservative, white working-class person.

2. Endocentric compounds

This compound usually identifies the general class which the meaning of the entire word belongs (in most cases). The headed compounds would be regarded as having an internal centre, for examples:

a) a greeenstone is a kind of stone.

b) an armchair is a kind of chair.

2.3 Theoretical Framework

This sub-chapter becomes an important role in conducting the research because it provides all the basic theories for the study. There are two research questions proposed here: (1) What types of English compound words can be found in the selected articles of BBC news?, (2) How can the orthographic features and the meanings of English compound words be described in the selected articles of BBC news?. Before finding the answers of the research questions, it is necessary to describe the theory used.

To answer the research question number (1) the data are analysed using the theory of the types of English compound words by Bauer (1983). The types of English compound words are divided into eight types namely compound verbs, compound adjectives, compound nouns, compound adverbs, other form classes, rhyme-motivated compounds, ablaut-motivated compounds, and neo-classical compounds. The research question number (2) are analysed using the theory of the orthographic features of English compound words by Plag et al. (2009). The orthographic features of English compound words are classified into three categories. Those are connected writing of elements, elements written separately, or the use of the orthographic symbol of hyphen. Then, the meanings of English compound words are described based on McCarthy's theory. Those are exocentric compounds and endocentric compounds. In short, the theoretical framework of this study is presented as in the following fishbone framework.

Figure 2.5 The fishbone framework of the study

The theory of the orthographic features of English compound words by Plag et al. (2009) and the meanings of English compound words by McCarthy (2002)

The theory of the types of English compound words by Bauer (1983)

Conclusion

Englsih compound words based on the types, the orthographic features, and the meanings.

2. How can the orthographic features and the meanings of English compound words in the selected articles of BBC news be described based on the morphological analysis?

1. What types of English compound words can be found in the selected articles of BBC news?

Research Question 2

Research Question 1

CHAPTER 3. RESEARCH DESIGN AND METHODOLOGY

To determine the success of the whole research, it is needed the certain method and design of the research. This chapter provides the methodology used in the research. It consists of the type of the research, the research strategy, the data collection, the data processing, and the data analysis.

3.1 The Type of the Research

According to Denscombe (2007:247-250), there are two kinds of research in the social research. Those are quantitative and qualitative research. Both of them have some specific distinctions. Quantitative research tends to be associated with numbers as the unit of analysis, with an analysis, with a large-scale study, with a specific focus, with the researcher detachment, also with a predetermined research design. Whereas qualitative research tends to be associated with words or images as the unit of analysis, with a description, with a small-scale study, with a holistic perspective, with the researcher involvement, and also with an emergent research design. Therefore, qualitative research is used to do this research. Qualitative research uses qualitative data. Qualitative data takes the form of words (spoken or written) as the data analysis.

3.2 The Research Strategy

There are several kinds of research strategies especially in the social research. Denscombe (2007) mentions eight kinds of the research strategies such as surveys, case studies, experiments, ethnography, phenomenology, grounded theory, mixed methods, and action research. The research strategies aim at putting the social researcher in the best possible position to gain the best outcome from the research.

In achieving the goals of the research, this study applies case studies as the research strategy. According to Denscombe (2007:35), case studies focus on one or just a few instances of a particular phenomenon with a view providing an in-depth account of events, relationships, experiences or processes occurring in that particular instance. In this research, the case occurs on the various formations of English compound words found in the five selected articles of BBC news.

3.3 The Data Collection

There are two subdivisions of the data collection. They are the type of the data and the technique of collecting data.

3.3.1   The Type of the Data

The data of this research are qualitative data. The data are in the form of words which are categorised as English compound words. The source of the data of this research are taken from five selected articles of BBC news which are printed from BBC's website (http://www.bbc.com).

3.3.2   The Technique of Collecting Data

This study uses document as the technique of collecting data. Documents are using written materials as a basis for the research (Blaxter et al., 2006:154). The documents are taken from BBC's website. However, there are some evaluations of internet documents and web pages as the source of the data of the research (Denscombe, 2007:234). Those evaluations are the authoritativeness of the site, the trustworthiness of the site, how up-to-date the site is, and the popularity of the site. From all the evaluations, BBC news' from its website can be used as the source of the data of the research since it is one of the trustworthy and popular site in the world.

The population of this research are all articles in the BBC's website. This research uses the purposive sampling to get the data for analysis. Many articles with various topics are accessed easily from the website, but this research only takes the five selected articles as the source of the data. Therefore, the purposive sampling is chosen because this research intends to get many variations

of English compound words by choosing different topics of the five selected articles.

The five selected articles are mentioned as follows. The topic of the first article is about the issue of money laundering in the FIFA corruption which is entitled "*FIFA corruption: Swiss banks reported possible money laundering*". The topic of the second article is about the political crisis in Yemen which is entitled "*Yemen crisis: Islamic State claims Sanaa mosque attacks*". The topic of the third article is about the business issue of the new Airbus in Paris Air Show which is entitled "*Paris Air Show: the printed plane nears take off*". The topic of the fourth article is about the financial issue in Greek debt crisis which is entitled "*Greek central bank warns of painful euro and EU exit*". The last article is about the issue of sexual abuse at Australia's asylum camp which is entitled "*Australia asylum: Nauru review hears 'credible' sex abuse claim*".

To collect the data, the first step to do is underlined the patterns of English compound words from the five selected articles. After that, the English compound words are rewritten to get the clear data. Then, the data are sorted based on the definition of compounding by Plag et al. (2009). It is predicted that there will be 150 patterns of English compound words as the data to be analysed further.

3.4 The Data Processing

The processing data of this research can be represented as follows:

1. Preparing data.

   In this case, the data that have been rewritten and sorted are ready to be classified.

2. Interpreting data (developing codes, categories and concepts).

   The types of English compound words are classified based on Bauer's theory (1983). The orthographic features of English compound words are analysed based on Plag et al.'s theory (2009). The meanings of English compound words are classified based on McCarthy's theory (2002).

3. Verifying data.

   To make sure all the investigated data from the five selected articles are right, more additional information are taken from the online dictionaries and the internet source. The online dictionaries are Oxford Online Dictionary, Cambridge Online Dictionary, and the free dictionary. The internet sources are *www.businiessdictionary.com*, *www.allbussiness.com*.

4. Representing data.

   As the result, the whole data of the research present in the data analysis completely.

3.5 The Data Analysis

The descriptive analysis is used in this research. McMillan (1992:12) states that descriptive method can be conducted as the procedure to solve the problems of the research by using current facts and phenomena, and this method describes the facts and explains the phenomena. This study shows the types of English compound words proposed by Bauer (1983). The orthographic features of English compound words are analysed based on Plag et al.'s theory (2009). Based on the semantic criteria, the meaning of compound words are analysed using McCarthy's theory (2002). After all the data have been analysed, the importance of understanding on English compound words for English learners in the five selected articles of BBC news are described by reviewing literature review about English compound words.

Following is the example of the data analysis. One of the sentences containing English compound words is taken from the selected articles of BBC news entitled "*Greek central bank warns of painful euro and EU exit*":

(3.1) About €30bn was *withdrawn* from Greek *bank deposits* between
   October and April, the *central bank* added.

Sentence (3.1) has three compound words. They are *withdrawn, bank deposits,* and *central bank*. *Withdrawn* classified as English compound verb. The pattern of this compound is Particle + Noun. *Withdrawn* is written as a one word.

It classifies into exocentric compound and means removed money from circulation in Greek bank deposits. *Bank deposits* and *central bank* classified as English compound nouns. These compounds have pattern of the constituents as Noun + Noun combination. The internal structure of *bank deposits* consists of (Stem + (Stem + Suffix)) structure. The inflectional suffix -*s* indicates plural form. This compound is written separately. It has endocentric meaning and means an amount of money in cash or check from or sent via a wire transfer that is placed into a bank account. *Central bank* consists of (Stem + Stem) structure of the internal structure of the compound. This compound is written separately. It has exocentric meaning and means autonomous or semi-autonomous organization entrusted by a government to administer certain key monetary functions, such as (1) issue, manage, and preserve value of the country's currency, (2) regulate the amount of money supply, (3) supervise the operations of commercial banks, and (4) serve a banker's bank and the local lender of the resort.

Figure 3.1 The example of data analysis using fishbone framework
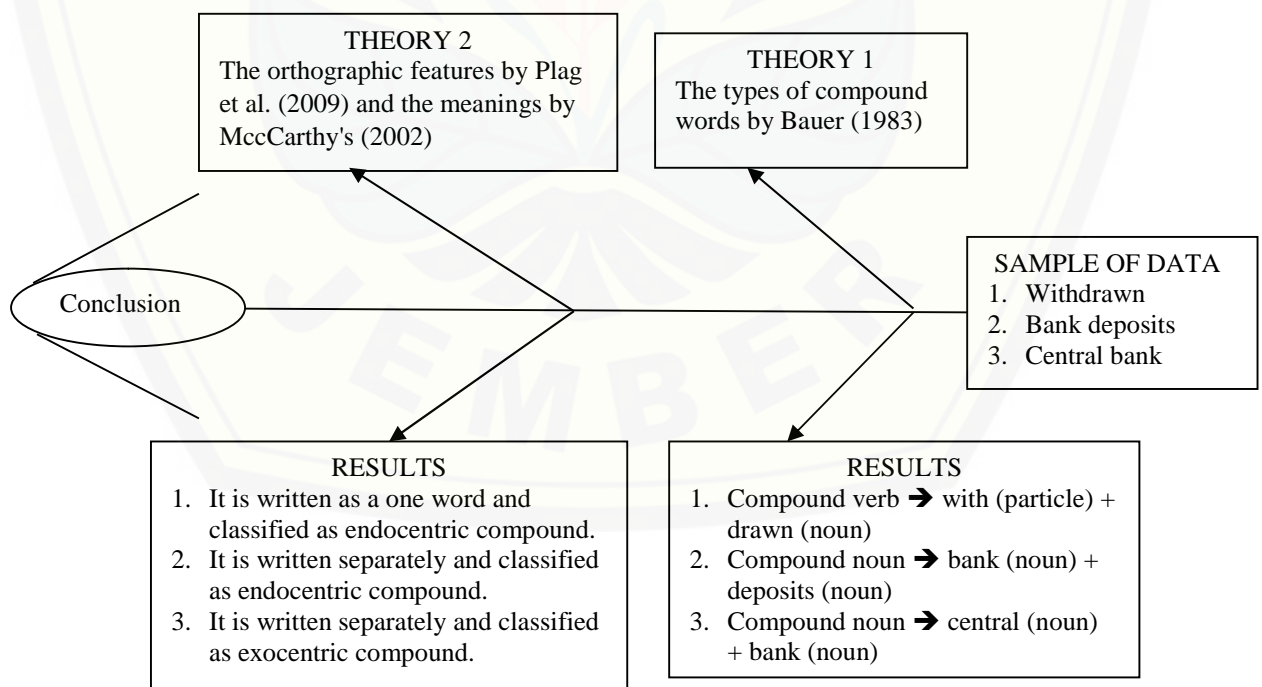
CHAPTER 5. CONCLUSION

This thesis discusses the morphological analysis on English compound words which are taken from five selected articles of BBC news. The selected articles contain a lot of formation of compound words which are written more complex. Therefore, to get to know what morphological aspects of compound words occur in the selected articles, it needs to be analysed in term of morphological analysis in order to be more understandable.

There are two research questions in this thesis. The first question is what types of English compound words can be found in the selected articles of BBC news. The answer to the first question is that there are five types of compound words found from five selected articles of BBC news as the source of the data. In total, there are 201 compounds from five selected articles. The types of compounds are compound nouns, other form classes, compound verbs, compound adjectives, and neo-classical compounds. These five types of compounds become the central discussion of this thesis. By these classification, it is found that there are 171 compound nouns, eighteen other form classes, six compound verbs, three compound adjectives, and three neo-classical compounds. Furthermore, each type of English compound words are explained about the roles in the sentences, the patterns, the grammatical heads and the modifiers. By these explanations, it is found that most of compounds in the selected articles have grammatical heads in the right hand elements and modifiers in the left hand elements. The right hand elements mostly determines the word classes of the whole compounds.

The second question is how the orthographic features and the meanings of English compound words can be described in the selected articles of BBC news. First of all, from 201 compound words, there are 146 compounds are written separately, forty four compounds are written as a one word, and eleven

compounds are hyphenated. When the compounds are complex and longer, the compounds tend to be written separately rather than as a one word or hyphenated. Each type of compounds has many variations in the structures of the constituents. Some of them consist of both simplex nouns, one of components is also a compounds, or both of components are compounds. When the compounds have compounds in their components, the additional of affixation are found. Prefixation and suffixation are mostly added in the second constituents of the compounds. There are 155 compounds with endocentric meanings and forty six compounds with exocentric meanings. Compounds which are had the grammatical heads in the right hand element, they are categorised as endocentric compounds. When the first and the second elements do not specify the meaning of the whole compounds, they are classified as exocentric compounds. Compounds which are written as a one word, tend to be classified as exocentric compounds. Whereas compounds which are written separately, tend to be classified as endocentric compounds.

In conclusion, to comprehend compound words, the learners should consider the elements which construct the compounds itself from the patterns, the orthographic features, and the production of meanings of compounds to comprehend English compound words.

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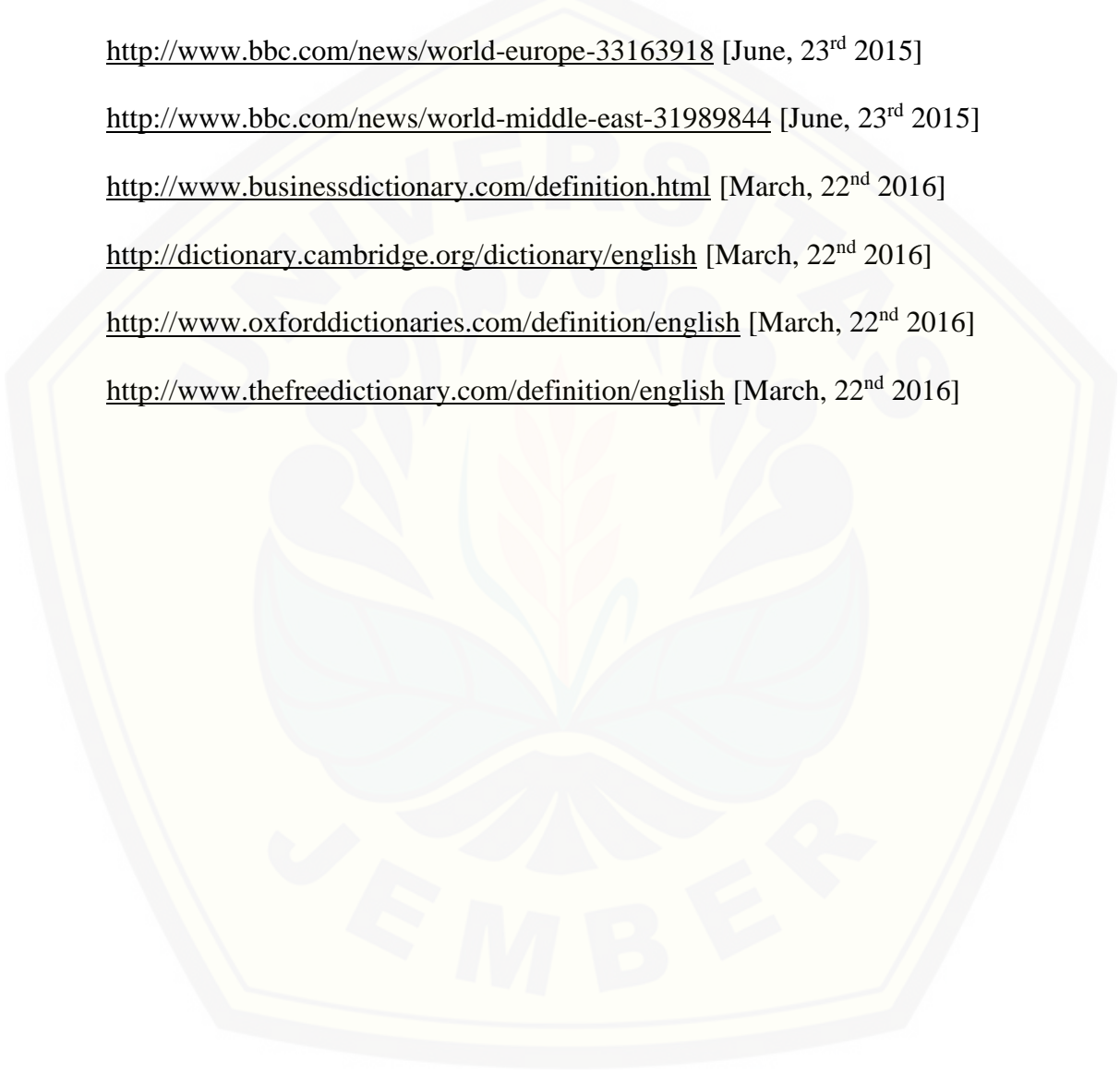
APPENDICES

A. The List of the Titles of the Articles

Articles	The Titles of the Articles
1	FIFA corruption: Swiss banks reported possible money laundering
2	Yemen crisis: Islamic State claims Sanaa mosque attacks
3	Paris Air Show: the printed plane nears take off
4	Greek central bank warns of painful euro and EU exit
5	Australia asylum: Nauru review hears 'credible' sex abuse claim

B. The Types of English Compound Words

B1. English Compound Nouns

No	Patterns	Articles	English Compound Nouns
1.	noun + noun	1	Fifa corruption, Swiss banks, money laundering, Swiss prosecutors, World Cups, Attorney General, Fifa data, Swiss investigation, chief ethics investigator, investigatory chamber, Fifa investigators, staff numbers, Swiss police, US justice department, Fifa officials, three-year inquiry, news conference, banking relations, bank accounts, anti-money-laundering framework, Fifa president, football, Fifa corruption inquiry, sports marketing, broadcasting, broadcasting executives, vice-president, development officer, vice-president Conmebol
		2	Yemen crisis, Islamic State, mosque attacks, suicide bombings, Yemeni capital, port city, suicide bombers, Friday prayers, broadcast, footage, broadcast footage, prayer hall, blood donors, air strike, spokesman, propaganda efforts, jihadist militant group, suicide attacks, warplanes, government buildings, security officers, mass protest, power-broker
		3	Paris Air Show, Airbus, engineering firsts, aircraft, joint venture, mainstream, 3D-related firms, Paris show, conference briefings, sidelines, fusing layer, aerospace giant, aircraft wings, 3D-printed main oxidiser valve, manufacturing process, printing machine, airframe, on-demand supply, aircraft lands, managing director, injection moulding, fuel efficiency, cooling system, rocket maker, cost advantages, 3D-printed thermoplastics parts, aircraft designs, plane makers, aircraft components, thermoplastic, thermoplastic material, civil aircraft, regulatory approval, interior use
		4	Greek central bank, eurozone, Greek government, economic reforms, bailout, bailout funds, bank deposits, central bank, Greek default, euro area, European Union, Greek worker, mid-morning, mid-morning trade, Greek stock exchange, benchmark, bank shares, last-ditch bid, Greek president, euro zone finance minister, Greek prime minister, Eurogroup, Eurogroup council, emergency bank assistance, Greek banks, capital controls, loan repayment, reform proposals, Greek public, Greek

			debt, pension payments, public sector wages, poverty line, EU officials, surplus target, electricity bills, Greece complains creditors, tax evasion, Greek ministers, sales tax, prime minister, borrowing costs, treasury bills, six-month treasury bills, debt auction, Greek unemployment rate
		5	Australia asylum, Nauru review, sex abuse, asylum camp, integrity commissioner, charity workers, immigration minister, asylum seekers, Pacific island, rights groups, Greens Senator, media outlets, 86-page report, Children staff members, claims women, claims cigarettes, Nauruan guards, camp staff, Nauru police, sexual harassment policy, investigation mechanisms, female detainees, media scrutiny, press conference
2.	verb + noun	3	cost-overruns
3.	noun + verb	-	-
4.	verb + verb	-	-
5.	adjective + noun	1	wrongdoing
		2	bloodied blankets, stronghold, White House
		4	slowdown, short-term
		5	indecent assault, sexual harassment, physical assault
6.	particle + noun	2	offshoot
		3	in-house
7.	adverb + noun	-	-
8.	verb + particle	4	bailout, standoff
9.	phrase compounds	-	-

B2. English Compound Verbs

No	Patterns	Articles	English Compound Verbs
1.	noun + verb	-	-
2.	verb + noun	-	-
3.	verb + verb	-	-
4.	adjective + verb	-	-
5.	particle + verb	2	overwhelmed, uprooted
		3	underlined
		4	withdrawn
		5	under-reported
6.	adjective + noun	-	-
7.	noun + noun	5	to self-harm

B3. English Compound Adjectives

No	Patterns	Articles	English Compound Adjectives
1.	noun + adjective	-	-
2.	verb + adjective	-	-
3.	adjective + adjective	1	deep-rooted
4.	adverb + adjective	-	-
5.	noun + noun	-	-
6.	verb + noun	-	-
7.	adjective + noun	1	widespread
8.	particle + noun	-	-
9.	noun + verb	3	computer-generated
10.	verb + verb	-	-
11.	adjective/adverb + verb	-	-
12.	verb + particle	-	-

B4. Neo-Classical Compounds

No	The patterns	Articles	Neo-classical compounds
1.	*Poly-* + theist	2	Polytheist
2.	*Thermo-* + plastics	3	Thermoplastics
3.	*Super-* + jumbo	3	Super-jumbo

B5. Other Form Classes

No	Types of Other Form Classes	Articles	Other Form Classes
1.	Compound prepositions	1	in addition
		2	into
		3	within,
		4	instead of, without
		5	because of
2.	Compound pronouns	2	itself
		3	somewhere
		4	nothing, everything, elsewhere
		5	something, themselves, anything, anymore, anybody
3.	Compound conjunctions	1	however
		2	meanwhile

C. The Distributions of Internal Structures of Compound Nouns

No	The Internal Structures of the Constituents	English Compound Nouns
1.	Stem + Stem	Attorney General, Fifa data, Swiss police, Fifa president, Australia asylum, sex abuse, asylum camp, Pacific island, camp staff, Nauru police, prime minister, media scrutiny, joint venture, Paris show, aerospace giant, interior use, central bank, euro area, Greek president, finance minister, Greek public, Greek debt, poverty line, surplus target, tax evasion, debt auction, debt mountain, Yemen crisis, port city, suicide attack, air strike, militant group, framework, football, mainstream, Airbus, aircraft, airframe, Eurozone, Eurogroup, broadcast, footage, vice-president
2.	Stem + (Stem + Suffix)	Fifa corruption, Swiss banks, Swiss prosecutors, money laundering, World Cups, Swiss investigation, justice department, Fifa officials, bank accounts, news conference, integrity commissioner, charity workers, staff members, asylum seekers, media outlets, rape allegations, female detainees, press conference, fuel efficiency, rocket maker, plane makers, Greek government, bank deposits, Greek worker, Greek shares, bank assistance, Greek banks, pension payments, suicide bombings, suicide bombers, Friday prayers, blood donors, propaganda efforts, mass protests, broadcasting, sidelines, warplanes
3.	(Stem + Suffix) + Stem	immigration minister, printing machine, cooling system, sales tax, prayer hall, Greens Senator, spokesman
4.	(Stem + Suffix) + (Stem + Suffix)	banking relations, sports marketing, development officer, claims women, claims cigarettes, investigation mechanisms, engineering firsts, conference briefings, fusing layer, managing director, injection moulding, regulatory approval, electricity bills, borrowing costs, treasury bills, 5government buildings, security o6fficers,

rights groups

5.	((Prefix + Stem) + Stem)	reform proposal, anti-money-laundering
6.	(Stem + (Prefix + Stem))	Nauru review, Greek default, stock exchange, loan repayment
7.	(Prefix + Stem) + (Prefix + Stem)	-
8.	(Stem + Stem) + Noun	three-year inquiry, vice-president Conmebol, broadcasting executives, sexual harassment policy, aircraft wings, aircraft lands, 3D-related firms, aircraft design, aircraft components, bailout funds, last-ditch bid, mid-morning trade, Eurogroup council
9.	Noun + (Stem + Stem)	Fifa corruption inquiry, Paris Air Show, civil aircraft, Greek central bank, Greek bank deposits, Greek stock exchange, emergency bank assistance, Greek prime minister, jihadist militant group
10.	(((Noun + Noun) + Noun) + Noun)	US justice department, eurozone finance minister, six-month treasury bills, broadcast footage

D. The Orthographic Features and Meanings of English Compound Words

D1. Compound Nouns

The Orthographic Features	The Meanings	
	Endocentric Compounds	**Exocentric Compounds**
Writing as a one word	spokesman, warplanes, aircraft, sidelines, airframe, broadcast, footage, broadcasting, framework, thermoplastic	eurozone, Eurogroup, benchmark, mainstream, Airbus, football, wrongdoing, stronghold, slowdown, offshoot, bailout, standoff
Writing separately	Fifa corruption, Swiss banks, Swiss prosecutors, World Cups, Fifa data, Swiss investigation, chief ethics investigator, investigatory chamber, Fifa investigators, staff numbers, Swiss police, US justice department, Fifa officials, three-year inquiry, news conference, banking relations, bank accounts, Fifa president, Fifa corruption inquiry, sports marketing, broadcasting executives, development officer, vice-president Conmebol, Yemen crisis, mosque attacks, suicide bombings, Yemeni capital, port city, suicide bombers, broadcast footage, prayer hall, blood donors, air strike, propaganda efforts, jihadist militant group, suicide attacks, government buildings, security officers, mass protest, bloodied blankets, Paris Air Show, engineering firsts, 3D-related firms, Paris show, conference briefings, fusing layer, aerospace giant, aircraft wings, 3D-printed main oxidiser valve, manufacturing process, printing machine, on-demand supply, aircraft lands, managing director, injection moulding, fuel efficiency, cooling system, rocket maker, 3D-printed thermoplastics parts, aircraft designs, plane makers, aircraft	Attorney General, money laundering, anti-money-laundering framework, Islamic State, Friday prayers, Greens Senator, debt auction, tax evasion, sales tax, loan repayment, central bank, bank shares, last-ditch bid, emergency bank assistance, cost advantages, joint venture, White House

components, thermoplastic material, civil aircraft, regulatory approval, interior use, Greek central bank, Greek government, economic reforms, bailout funds, bank deposits, Greek default, euro area, European Union, Greek worker, mid-morning trade, Greek stock exchange, Greek president, euro zone finance minister, Greek prime minister, Eurogroup council, Greek banks, capital controls, reform proposals, Greek public, Greek debt, pension payments, public sector wages, poverty line, EU officials, surplus target, electricity bills, Greece complains creditors, Greek ministers, prime minister, borrowing costs, treasury bills, six-month treasury bills, Greek unemployment rate, Australia asylum, Nauru review, sex abuse, asylum camp, integrity commissioner, charity workers, immigration minister, asylum seekers, Pacific island, rights groups, media outlets, 86-page report, Children staff members, claims women, claims cigarettes, Nauruan guards, camp staff, Nauru police, sexual harassment policy, investigation mechanisms, female detainees, media scrutiny, press conference, indecent assault, sexual harassment, physical assault

Hyphenated	Vice-president, mid-morning	power-broker, in-house, cost-overrun, short-term

D2. Compound Verbs

The Orthographic Features	The Meanings	
	Endocentric Compounds	Exocentric Compounds
Writing as a one word	Underlined	Overwhelmed, withdrawn, uprooted
Writing separately	-	-
Hyphenated	-	Under-reported, to self-harm

D3. Compound Adjectives

The Orthographic Features	The Meanings	
	Endocentric Compounds	Exocentric Compounds
Writing as a one word	-	Widespread
Writing separately	-	-
Hyphenated	Computer-generated	Deep-rooted

D4. Neo-classical Compounds

The Orthographic Features	The Meanings	
	Endocentric Compounds	Exocentric Compounds
Writing as a one word	Polytheist	Thermoplastic
Writing separately	-	-
Hyphenated	Super-jumbo	-

D5. Other Form Classes

The Orthographic Features	The Meanings	
	Endocentric Compounds	Exocentric Compounds
Writing as a one word	Anything, anymore, anybody, something, themselves, somewhere, elsewhere, nothing, everything, itsef, however	Meanwhile, within, without, into
Writing separately	In addition, because of	Instead of
Hyphenated	-	-

E. The First Article

The first article was published on: June 17th, 2015.

Fifa corruption: Swiss banks 'reported possible money laundering

Swiss prosecutors are investigating 53 cases of possible money laundering in their inquiry into bidding for the 2018 and 2022 Fifa World Cups.

Attorney General Michael Lauber said the incidents had been reported by Swiss banks.

He said his office was analysing a "huge amount" of seized Fifa data in its inquiry.

The Swiss investigation is running in parallel to one being carried out by the US. Separately, Fifa's chief ethics investigator said on Wednesday that the organisation was also looking into alleged breaches by officials relating to bidding for the 2018 and 2022 tournaments.

"Should new evidence come to light, the investigatory chamber will widen the group of suspects," Carl Borbely said in a statement, adding that Fifa investigators were prepared to increase staff numbers "at any time if needed".

The 2018 and 2022 World Cups were awarded to Russia and Qatar respectively. But senior Fifa official Domenico Scala has said the awards could <u>be cancelled if evidence emerges of bribery</u>.

Both countries deny any wrongdoing.

'Complex' inquiry

Fifa is facing claims of widespread corruption after Swiss police raided a hotel in Zurich - where Fifa is based - and arrested seven of its top executives last month.

The seven were held at the request of the US justice department which has charged 14 current and former Fifa officials and associates on charges of "rampant, systemic, and deep-rooted" corruption.

The charges follow a three-year inquiry by the FBI.

Also in May, Swiss prosecutors opened separate criminal proceedings "against persons unknown on suspicion of criminal mismanagement and of money laundering" in connection with the 2018 and 2022 World Cups.

However, until now, much less has been revealed about the Swiss investigation than the inquiry being led by the FBI.

Mr Lauber told a news conference that the investigation was "huge and complex on many levels" and would take a long time.
"So far our investigative team obtained evidence concerning 104 banking relations (relationships between banks and clients). And, be aware that every banking relation represents several bank accounts," Mr Lauber said.

"We note positively that banks in Switzerland did fulfil their duties to file suspicious activity reports. Partly in addition to the 104 banking relations already known to the authorities, banks announced 53 suspicious banking relations via the anti-money-laundering framework of Switzerland."

Mr Lauber said he did not rule out interviews with Fifa president Sepp Blatter as part of his investigation.

Mr Blatter has denied any wrongdoing and announced earlier this month that he will resign.

Mr Lauber said his investigation was separate from that being carried out by the FBI and that documents and data would not be shared automatically with the US.

He added: "The world of football needs to be patient. By its nature, this investigation will take more than the legendary 90 minutes."

Fifa corruption inquiry: indicted officials

☐ Members of Fifa   ☐ Sports marketing/ broadcasting executives

Jeffrey Webb
Vice-president

Eugenio Figueredo
Vice-president

Jack Warner
Former Vice-president

Eduardo Li
Concacaf

Julio Rocha
Development officer

Costas Takkas
Concacaf

Rafael Esquivel
Vice-president Conmebol

Jose Maria Marin
Brazilian FA

Nicolas Leoz
Former member Conmebol

Alejandro Burzaco

Aaron Davidson

Hugo Jinkis

Mariano Jinkis

Jose Margulies

Source: US Dept of Justice

BBC

F. The Second Atticle

The second article was published on: March 21th, 2015.

Yemen crisis: Islamic State claims Sanaa mosque attacks

Islamic State (IS) say its militants carried out suicide bombings on two mosques in the Yemeni capital, Sanaa, which killed at least 137 people.

The attacks are the first claimed by IS - a Sunni group - since it set up a branch in Yemen in November.

Both mosques were used mainly by supporters of the Zaidi Shia-led Houthi rebel movement, which controls Sanaa.

Yemen has suffered from political instability for years and Houthi rebels control nine of the 21 provinces.

The government of internationally recognised President Abed Rabbo Mansour Hadi has fled to the southern port city of Aden.

Four suicide bombers attacked the Badr mosque, in the south of Sanaa, and the al-Hashoosh mosque, in the north of the capital, as worshippers gathered for Friday prayers.

At the Badr mosque, one bomber entered the building and detonated his explosives while other people were caught by the second bomber near the main gates.

Prominent Houthi cleric Al-Murtada bin Zayd al-Mahatwari, the imam of the Badr mosque, was among those killed, local media reported.

Two more bombers attacked the al-Hashoosh mosque, with one detonating explosives near the entrance and the other running into the mosque itself.

"Blood was running like a river," said survivor Mohammed al-Ansi.

Both mosques were packed for Friday prayers when the bombers struck

Victims were strewn across the floor by the force of the blasts

Hospitals in Sanaa were overwhelmed with the number of casualties

Rebel controlled al-Masirah TV broadcast footage from the al-Hashoosh mosque showing volunteers using bloodied blankets to carry away victims. Bodies were also lined up in the prayer hall.

About 300 people were wounded, medics said, and hospitals appealed for blood donors.

There was another suicide attack on a mosque in the northern city of Saada - a Houthi stronghold - reports said, but only the attacker was killed.

Air strike

Both al-Qaeda and IS consider Shia Muslims to be heretics and have rallied against Houthis in Yemen.

A statement from Islamic State published on Twitter promised further attacks.

"Let the polytheist Houthis know that the soldiers of the Islamic State will not rest until we have uprooted them," the statement said.

The White House "strongly condemned" the attacks, but said it could not confirm that those behind them were affiliated with IS.

Spokesman Josh Earnest said IS could be falsely claiming responsibility.

"It does appear that these kinds of claims are often made for a perception that it benefits their propaganda efforts," he told reporters.

Houthi areas of influence

Source: American Enterprise Institute — BBC
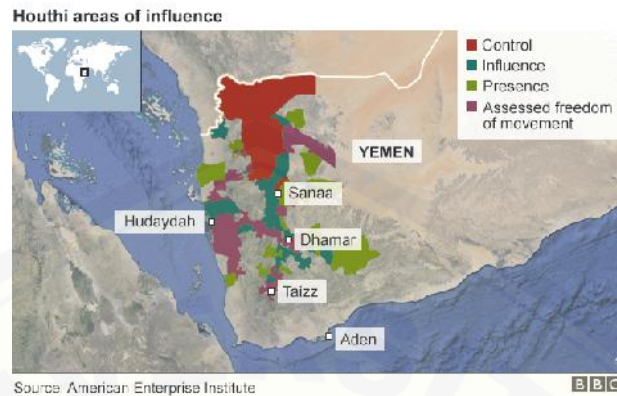
Yemen is the base of al-Qaeda in the Arabian Peninsula (AQAP), a powerful offshoot of the jihadist militant group that has carried out similar suicide attacks on Houthi supporters.

AQAP denied carrying out Friday's bombings, citing instructions from its leader Ayman al-Zawahri not to target mosques or markets.

Meanwhile, deadly clashes erupted in Aden on Thursday between forces loyal to President Hadi and those supporting his predecessor, Ali Abdullah Saleh.

Aden has been President Hadi's base since he fled Sanaa last month after being placed under effective house arrest by Houthi rebels when they took control of the capital in January.

On Friday, warplanes targeted the presidential palace in Aden for a second day but Mr Hadi's aides said he was unharmed. Officials said the planes were flown by pilots allied to the Houthis and Mr Saleh.

There were also reports on Friday that al-Qaeda fighters had taken control of the southern city of al-Houta. They reportedly took over barracks and government buildings, killing several security officers in the process.

Mr Saleh was forced to hand over power to Mr Hadi in 2011 after mass protests, but has remained a power-broker. He is currently allied with the Houthis, against whom he fought wars when he was president.

G. The Third Article

The third article was published on June 16th, 2015.

Paris Air Show: the printed plane nears take off

The Airbus A350 has a number of 3D printed parts

The new Airbus A350 XWB that is flying daily displays at the Paris Air Show can claim several engineering firsts.

One of these is that it has more 3D printed components than any other aircraft, about 1,000 on a plane that has only just gone into service.

Meanwhile, Raytheon has 3D parts on its missiles, while makers of drones are increasingly using them. And United Launch Alliance - a joint venture between Lockheed Martin and Boeing - has the parts on the rockets it sends into space.

No longer is 3D a novelty manufacturing process. It's going mainstream, underlined by the number of 3D-related firms at the Paris show and conference briefings being held on the sidelines.

And it has the potential to transform the aerospace industry's global supply chain and cost structure, producing parts faster, and which are lighter and mean less waste. It may also mean companies bringing more production back in-house.

The 3D components on the A350 XWB are mostly widgets and brackets, formed by fusing layer upon layer of resins in machines that replicate computer-generated 3D models. (Metals and even glass can also be used).

So, we're talking about small routine parts here, rather than large structures - at the moment.

But don't dismiss the significance that 3D printing is playing, says Ian Risk, Airbus Group's head of innovations in the UK, where the aerospace giant makes aircraft wings.

The SpaceX Falcon 9 rocket has a 3D-printed main oxidiser valve in one of its engines.

"These components contribute a huge amount to the manufacturing process. Often, it's the fiddly parts that create delays in production," he said.

The size of the component being made is limited by the size of the printing machine.

Mr Risk doubts there will ever be a machine big enough to turn out a whole airframe. "But we are looking at wider applications," he said. "The scale of what we do will increase."

On-demand supply

3D printing's biggest supporters talk of a future world in which machines will be sited at key locations across the globe, churning out components when needed - not stored in a factory somewhere awaiting delivery to factories.

Say, for example, an A380 super-jumbo is flying into Singapore and needs a new part. In our digitally connected world, a machine could be programmed to start printing even before the aircraft lands.

It sounds good in theory, and Mr Risk says that "agile manufacturing" will certainly reshape the industry's global supply chain and reduce lead times.

But there are plenty of hurdles, especially the issue of transmitting secure data across the world, he said.

While the holy grail of on-demand supply may be a little way off, John Schmidt, US-based managing director of aerospace and defence at consultancy Accenture, says printing is reducing lead times from months to weeks.

He says it's too far early to call the end of traditional manufacturing - machining, casting and injection moulding. But the technology and scale of 3D printing will inevitably improve, so it's only a matter of time before a tipping point is reached.

'First time, right time'

3D parts reduce weight on aircraft, and so improve fuel efficiency, he says. And making one 3D part often replaces the need to combine several smaller parts, reducing the need to carry inventory.

Part of a cooling system used by rocket maker ULA now uses 16 parts, where before it was 140. ULA also says it has cut costs on its latest Atlas rocket by $1m using 3D.

Mr Schmidt added: "3D is also ideal for industries with short production runs - like aerospace - as it maximises the cost advantages of smaller production runs." It also reduces waste, as the component is built up rather than cut from a block of material.

ULA's Atlas rocket uses 3D-printed thermoplastic parts

He predicts that one of the most significant impacts could be on aircraft design, especially as 3D offers the promise to produce more complex shapes. "It opens options to be innovative in ways that do not exist now; to build something the first time and at the right time," he said.

And wouldn't that be good news for plane makers, whose big industrial projects are frequently plagued by production delays and cost-overruns.

Sky's the limit

The US-Israeli company Stratasys makes 3D machines and supplies materials and composites used to build components.

Director Scott Sevcik predicts that within 10 years, about 40-50% of aircraft components will use printed materials. It's about 4% now. In 20 years, the vast majority of parts will have some form of 3D printed contribution.

The thermoplastic material that Stratasys supplied for ULA's rockets can operate in extreme heat and cold, as well as under intense vibration and speed. As with 3D components used in civil aircraft, they have to go through rigorous regulatory approval.

Mr Sevcik said the ULA parts are for interior use, but that if tests on Stratasys' plastic, called Ultem, go to plan then 3D parts could be used on the exterior of unmanned rockets with a couple of years.

"It is very hard now to think of anything that won't be printable at some point in the future," he said, given advances in technology and material science.

H. The Forth Article

The forth article was published on June 17th, 2015.

Greek central bank warns of 'painful' euro and EU exit

Greece's central bank has warned for the first time that the country could be on a "painful course" to default and exit from both the eurozone and the EU.

It comes as the Greek government and its international creditors blamed each other for failing to reach a deal over economic reforms.

That failure is holding up the release of €7.2bn (£5.2bn) in bailout funds.

About €30bn was withdrawn from Greek bank deposits between October and April, the central bank added.

The central bank also warned the country's economic slowdown would accelerate without a deal.

Greeks are wondering if they will have to resurrect their past, including their old currency, as James Reynolds reports

"Failure to reach an agreement would... mark the beginning of a painful course that would lead initially to a Greek default and ultimately to the country's exit from the euro area and, most likely, from the European Union," the Bank of Greece said in a report.

"Striking an agreement with our partners is a historical imperative that we cannot afford to ignore."

Greek finance Minister Yanis Varoufakis, when asked if there could be an agreement at the meeting of euro zone finance ministers in Luxembourg on Thursday, said: "I do not believe so."

He said preparatory work for the meeting had not gone far enough for a deal.

Greek shares fell sharply again. The Athens General Index closed 3.2% lower which takes its loss for the past four trading sessions to almost 19%.

'Solidarity'

Austrian Chancellor Werner Faymann was in Athens on Wednesday in a last-ditch bid to end the standoff.

"For Europe to be stronger, it must show solidarity and support to any country which needs it," he said during a meeting with Greek President Prokopis Pavlopoulos.

That came ahead of a meeting of euro zone finance ministers on Thursday although officials have played down expectations of a make-or-break decision being reached.

Greek worker: "I work 18 hours a day and it's difficult to feed my family"

The Austrian chancellor's comments followed a harsher critique from European Commission President Jean-Claude Juncker, who on Tuesday accused the Greek government of misleading voters, as Greek Prime Minister Alexis Tsipras accused the EU and International Monetary Fund (IMF) of trying to "humiliate" his country.

Greece - deal or no deal?
- Option 1: No deal: Greece defaults on IMF and ECB repayments; ECB pulls plug on emergency bank assistance leading to run on Greek banks, capital controls and potential Grexit
- Option 2: Greece agrees reform deal with creditors at last minute and avoids default, staying in euro
- Option 3: No deal reached but both sides paper over cracks and Greece stays in euro for now

Greece has two weeks remaining to strike a deal with its creditors or face defaulting on an existing €1.6bn (£1.1bn) loan repayment due to the IMF.

The country has already rolled a €300m payment into those due on 30 June.

Peston: Will ECB keep Greece afloat?

Mr Juncker said the Greek government had not told the truth about its latest reform proposals.

"I am blaming the Greeks [for telling] things to the Greek public which are not consistent with what I've told the Greek prime minister," Mr Juncker said.

Mr Tsipras has said that the lenders wanted to raise VAT on electricity.

Greek debt talks: main sticking points
- Greece will not accept cuts to pension payments or public sector wages, saying two-thirds of pensioners are either below or near the poverty line
- International creditors want pension spending cut by 1% of GDP - it accounts for 16% of Greek GDP. They say their target is early retirement not individual pensions
- EU officials say Greece has agreed to budget surplus targets of 1% of GDP this year, followed by 2% in 2016 and 3.5% by 2018. Greece says nothing is agreed until everything is agreed
- Creditors also want a wider VAT base; Greece says it will not allow extra VAT on medicines or electricity bills
- Greece complains creditors focus on increasing taxes instead of cracking down on tax evasion; IMF is concerned Athens is not offering credible reforms

Is Greece close to Grexit?

Other Greek ministers have criticised suggestions to increase sales tax on medicines.

But Mr Juncker said: "I'm not in favour, and the prime minister knows that... of increasing VAT on medicaments and electricity. This would be a major mistake."

"The debate in Greece and outside Greece would be easier if the Greek government would tell exactly what the Commission... are really proposing," he added.

Mr Varoufakis claimed that EU proposals did include VAT increases: "Juncker either hadn't read the document he gave Tsipras - or he read it and forgot about it."

Elsewhere in the eurozone, Portugal's short-term borrowing costs rose sharply on Wednesday, with yields on six-month treasury bills jumping from minus 0.002% to 0.044% at the country's latest debt auction.

The rise came despite an assurance to investors from Prime Minister Pedro Passos Coelho that Portugal would not be "the next to fall" in the event of a Greek default.

In June
Greece owes...
6.74bn euros

1.5bn to the IMF

5.2bn in short-term bills

In July
Greece owes...
5.95bn euros

452m to the IMF

2bn in short-term bills

3.5bn to the ECB

Greece in numbers
€320bn = Greece's debt mountain
€240bn = European bailout
- 177% country's debt-to-GDP ratio
- 25% fall in GDP since 2010
- 26% Greek unemployment rate

Source: ECB, IMF, Greek National Statistics Agency

I. The Fifth Article

The fifith article was published on March 20th, 2015.

Australia asylum: Nauru review hears 'credible' sex abuse claims

An inquiry into reports of sexual abuse at Australia's asylum camp in Nauru found "credible" claims of assault and harassment.

The inquiry, conducted by former integrity commissioner Philip Moss, found two allegations of rape and others of "indecent assault, sexual harassment and physical assault".

It found no evidence charity workers lied about abuse claims at the centre.

The probe made 19 recommendations, which the government said it accepted.

Australian Immigration Minister Peter Dutton said sexual assault was "not something that we would accept in Australia, and it's not something that the Nauruans accept in their community".

Australia sends asylum seekers who arrive by boat to camps in the Pacific island of Nauru and in Papua New Guinea for processing. Conditions in these camps have been strongly criticised by rights groups.

This review was ordered in October 2014, after Greens Senator Sarah Hanson-Young and media outlets reported multiple allegations of abuse against asylum seekers.

At the same time, the Australian government ordered a group of Save the Children staff to leave Nauru, suggesting they were encouraging asylum seekers to make complaints and even to self-harm.

Save the Children strongly rejected this and, in its heavily-redacted 86-page report, the review noted "that it has not obtained any information which substantiates the alleged misconduct in relation to the Save the Children staff members".

But it found:
- Two specific rape allegations had been made - one had been referred to police
- Sexual and physical assault were being under-reported for cultural reasons. There were also reported and unreported claims of abuse against minors.
- Claims women were forced to expose themselves to sexual exploitation in exchange for showers were "likely to be based on one particular incident"
- Claims cigarettes were being traded for sexual favours could not be substantiated, but it was possible Naruan guards were selling marijuana for sexual favours
- Many detainees were concerned about their personal safety and privacy
- The veracity of detainees' claims could not be established, but the interviewees "were generally credible and their accounts convincing"

It said when formal complaints had been made, camp staff "in the most part" had acted appropriately and referred them where necessary to the Nauru police. But it said processes for responding to allegations could be improved and local investigative resources were limited.

Its recommendations included better training on sexual harassment policy for staff, and improved abuse reporting and investigation mechanisms.

The government says it will address all of the report's points.

One woman's story

Shadi (not her real name), is a young Iranian woman detained in Nauru. She has been in touch with BBC Persian's Fariba Sahraei for more than a year, and in February spoke about sexual abuse and harassment.

"I've seen it more times than you can imagine," she said. "It used to be very difficult for me, but I've seen it so often now that I can't feel anything anymore. I've turned to stone."

Shadi said female detainees were targeted by guards. "The guards ask single girls for sexual favours in exchange for clothes, cigarettes or even marijuana that is smuggled into the camp."

But on some incidents, she said, people chose to keep silent.

"There are many Iranian families here… and because of their religion and worries about bringing disgrace to the family many of them don't want to talk about these things."

But Mr Dutton, the immigration minister, angrily rejected suggestions from journalists that the report, completed in early February, was released on the day former prime minister Malcolm Fraser died to avoid media scrutiny.

"I think any suggestions frankly from you or from anybody else that this relates to Malcolm Fraser's death, I just find quite an appalling question, to be honest," he told journalists at a press conference in Canberra.