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**SEMANTIC AND STRUCTURAL FEATURES OF VERB-BASED NOMINALIZATIONS IN SCIENCE POPULAR TEXTS**

BACHELOR THESIS

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# INTRODUCTION

Language is a unique device which helps not just to fulfil the need of communication, but also to gain and express knowledge. Many linguists such as Halliday and Hassan (1976), Beaugrande and Dressler (1981), Valeika (1985), Swales (1990), Downing and Locke (1992), Martin (1992), and others have studied and analysed different types of discourse in order to understand how language varies. However, language is such a complex system due to the multiple choices of creating and transforming words that sometimes it is difficult to define what transformation was used to create one or another word. Here we come with a language phenomenon called *nominalization*. According to MacArthur (1992:702) this phenomenon defines, “the process or result of forming a noun from a word belonging to another word class”. It could be generally said that nominalization is an operation of creating nouns by using words from other word classes, e.g. from verbs[[1]](#footnote-1), adjectives and other nouns.

Writers use nominalizations in popular scientific discourses because nominalizations are one of language economy devices which allow expressing an idea concisely. The purpose of science popular texts is to attract the readers by providing interesting and brief information. In order to accomplish this purpose, writers apply nominalizations, especially verb-based nominalizations, which help to compress the text.

The **object** of the present paper is the semantic and structural features of verb-based nominalizations which play an important role as being lexico-grammatical cohesive device in science popular texts.

The **aim** of this research paper is to analyse semantic and structural features of the verb-based nominalizations in science popular texts.

To achieve this aim the following **objectives** have been raised:

1. To present the theoretical material concerning the features of nominalization.
2. To discuss cohesion and coherence because nominalizations play an important role as being lexico-grammatical cohesive device in science popular texts.
3. To analyse the usage of verb-based nominalizations in science popular texts and to interpret their semantic and structural features.

**The research methods used in the present study are the following:**

1. The descriptive-theoretical literary analysis was used to review various issues concerning nominalization, cohesion and coherence.
2. The descriptive-analytical method was applied to examine and interpret verb-based nominalizations and their semantic and structural features.
3. The statistical method enabled to systemize and generalize the research results.

**The research material and the scope:**

Popular science texts concerning the topic of global warming were taken from the online English magazine *Popular science* (see the website http://www.popsci.com/). 700 examples of verb-based nominalizations were drawn and examined from 35 articles covering the period from January 8, 2012 to March 27, 2013.

**The relevance and novelty of the research:**

Nowadays, more linguists pay attention to the phenomenon of nominalization. The importance of nominalization has been studied by Halliday and Hassan (1976), Beaugrande and Dressler (1981), Valeika (1985), Swales (1990), Downing and Locke (1992), Sušinskienė (2006, 2008, 2010, 2012) in different point of views. While Halliday (2004) investigated nominalization as a grammatical metaphor, Sušinskienė (2006, 2008, 2010, 2012) investigated nominalizations as cohesive devices. Even though, writers tend to use nominalizations frequently in academic writing, but they also apply them in popular science texts. Despite the fact, that various linguists have already written many works concerning nominalization and its functions, but rather little attention has been paid to the semantic and structural features of verb-based nominalizations in science popular texts. Therefore, there is the need for more investigation in order to reveal how verb-based nominalizations operate as a lexico-grammatical cohesive device in science popular texts. Hence, the research in this field is necessary and useful.

**The structure of the work:**

The present research paper consists of the main body in which the progress of the research and the results are arranged in several sections, each divided into subsections. The first section, i.e. Introduction, defines the object, aim, objectives, research methods, material, scope, relevance, novelty and structure of the research paper. The sequent sections reveal the theoretical background of nominalizations. Another section investigates the usage and the semantic and structural features of verb-based nominalizations. The section of conclusions summarizes the research results and reveals if the objectives have been fully accomplished. The last section of references and sources shows the materials used in writing the present paper.

# THEORETICAL REVIEW OF NOMINALIZATION

## The concept of nominalization

In order to understand the uniqueness of language, we should pay attention to its main function which is to express communication. Many linguists as Halliday and Hassan (1976), Beaugrande and Dressler (1981), Valeika (1985), Swales (1990), Martin (1992) and others have analysed the importance of language as it helps to express the precise ideas that are logically linked according to lexical, grammatical and semantic relations. Every form of a language, whether it is written or spoken has ties which combine every phrase, expression or sentence into one coherent unit. The main purpose of a writer is to keep the text cohesive, due to the fact that a reader could be able to grasp and understand the gist of a text. Hence, it is significant to discuss nominalization because it plays an important role in helping to maintain the text coherent and cohesive[[2]](#footnote-2).

The concept of nominalization could be easily explained by Trask’s (2005:204) definition, “any grammatical unit which behaves like a noun or a noun phrase but which is built from something very different”is known as the nominalization. It means that nouns could be formed from other nouns, verbs and adjectives. For example: “the English word *arrive* is a verb, as in *She* ***arrived*** *at ten o’clock*, but the word *arrival* is a noun, as in *Her sudden* ***arrival*** *surprised us*” (Ibid.). Here we can see that the noun *arrival* is shaped from the verb *arrive* and it means that *arrival* is a nominalization of *arrive*. Consider another sample: “***The poor*** *are always with us*, in this sentence the adjective *poor* has been nominalized into a noun without any transformations of the word” (ibid.205). Consider these given examples: *He is so* ***vain***and *He is full of* ***vanity****.* In the first sample the word *vain* is an adjective while in the second example it is turned into a noun *vanity* by adding a suffix.

Banks (2003:129) states that there are a few options of creating nominalized forms of processes, but not every option is available for a particular verb. He distinguishes the following groups of verb-based nominalizations:

1. nominalizations which are morphologically identical with agnate verb (e.g. *haul, estimate, change*);
2. nominalizations which have no agnate verb, but which nevertheless designate a process (e.g. *occasion, preference, reading*).
3. nominalizations which have an agnate verb, but are not morphologically identical (e.g. *growth, translation, occurrence*).

Those nominalizations of the first group are morphologically alike with agnate verb but they might be pronounced differently according to the stress which indicates whether the word is used as a verb or as a noun. For instance, the word *protest*, when the first syllable is stressed the word is used as a noun while when the last syllable is stressed it is used as a verb. The second group of verb-based nominalizations expresses some kind of process but they do not have an agnate verb, the verb is only transformed into a noun. The third group of verb-based nominalizations that have an agnate verb, but differ morphologically are composed by adding various suffixes. This is the biggest source of creating not only the verb-based nominalizations but all kinds of nominalizations as well, because in the English language suffixation is the most common form of deriving words. The following suffixes are added in order to make verb-based nominalizations:

* *-ment* (e.g. *to engage engagement*);
* *-tion* (e.g. *to destruct destruction*);
* *-sion* (e.g. *to decide decision*);
* *-age* (e.g. *to pass passage*);
* *-ance* (e.g *to allow allowance*);
* *-ence* (e.g. *to persist persistence*);
* *-(e)ry* (e.g. *to bribe bribery*);
* *-ure* (e.g. *to enclose enclosure*);
* *-sis* (e.g. *to analyze analysis*);
* *-th* (e.g. *to grow → growth*) and etc.

Suffixation helps not only to create nouns from other word classes but also to avoid repetition. For instance: 1) *Mary is a very* ***clever*** *girl* and 2) *Her* ***cleverness*** *is the main reason why everyone admires her*. In the first sample the adjective *clever* is used while in the following sentence the nominalization of adjective *cleverness* is applied in order to avoid repeating the same word *clever*. Also, these examples disclose that nominalization assists in maintaining the link between two ideas.

Furthermore, Bussmann adds that, “virtually any word can be nominalized: conjunctions (*no ifs, ands, or buts*), adverbs (*the here and now*), particles (*a resounding no*), or parts of words (*an ism*)” (2006:804). It could be noted that nominalization is a unique phenomenon which helps the writer to create nouns from different word classes. Meanwhile Chomsky (1970), Fillmore (1968) and Lakoff (1970) expressed the idea that nominalization is a process which transforms a verbal phrase into a nominal form. It could be said that nominalization also serves as the noun creating device which might display different kinds of activities that are typical for the verb which is the basis of producing that nominalized noun.

One of the main functions of nominalization is that it serves as a cohesive device. Four groups of cohesive devices were distinguished by Valeika (1985:73-102):

1) grammatical (reference, substitution, ellipsis, and word order);

2) lexico-grammatical (articles, pronouns, conjunctives, conjunctive adjectives, particles, modal words, quantifiers, nominalizations);

3) lexico-syntactic (periphrasis, parenthesis);

4) lexical cohesion (lexical repetition, synonyms, antonyms, general nouns, hyponyms, meronyms, paronyms and converses).

This distinction shows that there are grammatical, lexico-grammatical, lexico-syntactic and lexical groups of cohesive devices. Nominalization is one of many cohesive devices that belong to the group of lexico-grammatical cohesive devices. Lexico-grammatical group is simply understood as the combination of vocabulary and grammar. It implies that every word consists of lexical and grammatical meanings. According to Perez (2007), lexico-grammatical devices are generally called texture. Online *Longman Dictionary of Contemporary English* (2008) *[[3]](#footnote-3)* provides a definition of a texture which is defined as, “the way the different parts of a piece of writing, music, art are combined in order to produce a final effect”. In addition to this, Stockwell (2009:1) notes that texture is actually perceived as being the experienced quality of textuality. While Eggins (2004:116) states that, “in language we use finite means to realize infinite ends”. Lexico-grammatical devices allow us to do this by providing finite expression units (i.e. sounds) which serve in realizing the infinite contents (i.e. meanings). In addition, it could be said that nominalization as being one of lexico-grammatical cohesive devices aids in creating a texture by forming a new word and incorporating a new meaning into that word. Also, nominalization is a unique method because it assists in compressing a lot of information in an economic way.

In conclusion, it can be said that nominalization is defined as a process by which the words belonging to different word classes are transformed into the corresponding nouns. The suffixation is the most productive way of deriving nominalizations which are useful lexico-grammatical cohesive devices that operate on helping to diminish the extent of a text. Moreover, the phenomenon of nominalization is perceived as being a method of transforming verbal expressions into nominal ones.

## Nominalization as the form of grammatical metaphor

It should be mentioned that such linguists as Halliday (2004), Downing and Locke (1992) stated that nominalizations can be understood as grammatical metaphors. Moreover, any situation might be expressed in a few ways. A typical way of realisation is called the congruent while the other way is a metaphorical one. These two ways are illustrated by samples:

1. *I* ***walked*** *in the evening along the river as far as Henley.*
2. *Our evening* ***walk*** *along the river took us to Hanley.*

The first example is a congruent form of realisation as the word *walk* in this sentence is interpreted as the main process and the Agent is *I*. While in the second sample the word *walk* which typically denotes a processis used as a metaphorical interpretation and becomes the Agent of a sentence. In this instance the process is realised by a nominal form instead of by a verb. What is more, there are even words in English that have already become as grammatical metaphor expressions. For example: *shopping* signifies the notion of “going to the shops and buying things” (Downing and Locke, 1992:148-149). Grammatical metaphor is a form of nominalization which provides an opportunity to express the same idea not in a typical but in a metaphorical way. As noted by Fairclough (2003:12-13), “instead of representing processes which are taking place in the world as processes (grammatically, in clause or sentences with verbs), they are represented as entities (grammatically, through nominalization i.e. transforming a clause into a nominal or noun-like entity)”. Thus, a grammatical metaphor might be grasped as a modification of a process where a clause is transformed into a nominal unit.

Downing and Locke (1992:150-152) categorized five most common types of grammatical metaphors:

1. Process realised as Thing:

*Take a deep* ***breath*** instead of ***Breathe*** *deeply.* The process *breathe* is nominalized and used as a grammatical metaphor denoting thing.

1. Attribute realised as Thing:

***The usefulness*** *of this machinery is dwindling* rather than *This machinery is becoming* ***less useful***. The attribute *less useful* is transformed into abstract noun *usefulness*.

1. Circumstance realised as Thing:

***The seventeenth century*** *saw the development of systemic scientific publication* or ***In the seventeenth century*** *scientific works began to be published systemically.* A circumstance *in the seventeenth century* is used metaphorically and functions as locative Subject *the seventeenth century.*

1. Process and circumstance as part of the Thing:

*His* ***best-selling*** *novel* instead of *His novel is* ***selling better*** *than others*. The process *selling* and a circumstance *better* are nominalized into one metaphorical expression *best-selling*.

1. Dependent situation as Thing;

***Fears of disruption to oil supplies from the Gulf*** *helped push crude oil prices above $20 a barrel* rather than ***Because people feared that oil would not be supplied as usual from the Gulf****, the price of crude oil rose to above $20 a barrel.* The situation expressed by *people feared that oil would not be supplied as usual from the Gulf* is exposed by nominal metaphor where the reader’s attention is drawn by noun *fears* instead of a situation demonstrated by a verb *feared*.

Generally it could be said that grammatical metaphor enables the writer to express the same idea in two distinct ways. Sometimes it even aids in compacting a lot of information in a few expressions. Also, grammatical metaphor assists in transforming the process, attribute, circumstance and situation into the realization of being a thing.

Ravelli (1988) adds that both the grammatical metaphor and the congruent expression have the same meaning by sharing the semantic context which is expressed in different forms. For example:

1. *They feel* ***secure*** (this is a congruent phrase) and 2) *Their feeling of* ***security*** (this is a metaphorical expression).

These two cases above have the same meaning which is expressed in distinct ways. The first example is a typical congruent saying while the second one is realized as a metaphor which signifies the same meaning but is revealed in a dissimilar form. Moreover, Ravelli argues that grammatical metaphors are formed according to derivation and agnation (1999:99). However, it is noted that sometimes, “the entire clause may be metaphorical, but often only parts of a clause are metaphorical” (Ibid.). While Tavernier (2002) provides the idea that grammatical metaphor which construes processes as nominal groups enables the two processes to be linked together within a clause. Thus, these nominal groups lead to a higher lexical density and a lower level of grammatical intricacy.

In accordance with Matthiessen (1995:678), “nominal groups may serve as metaphorical realizations of process configurations in alternate with congruent clauses”. It means that nominal groups are understood as grammatical metaphors because verbal expressions are transferred into nominal ones. Here nominalization fulfils a configuration of the process within the structure of the nominal group. Due to the fact that the grammatical metaphor is perceived as the nominalization of processes, Banks (2003) displays the idea that processes are congruently coded as verbs. When the processes are encoded as nouns then they are accepted as grammatical metaphors which have a non-congruent form.

To sum up, a nominalization is defined as a result of the metaphorization of the process. Grammatical metaphor is a useful form of nominalization because it enables a writer to reveal the same information in a few ways. Also, it aids in showing the idea in more abstract way accompanied by the density of the nominals. Grammatical metaphor gives a chance to pack a large amount of information into a small place.

## 1.3 Verb-based nominalizations

The biggest source of nominalizations is created from verbs. Therefore, verb-based nominalizations are most frequently used in order to compose nouns. According to Downing and Locke (1992:149), “languages abound in nouns”. Hence, nominalization is one of the reasons why language possesses so many nouns, as they are also created from verbs. Notwithstanding, to quote Sušinskienė (2012:137), “a nominalization is not an autonomous unit; it arises in the text and is based on an underlying proposition which is a set of relationships of the verb with it’s actants”. It reveals that a proposition[[4]](#footnote-4) is perceived as being the part of the meaning of a clause or sentence which is constant, despite changes in such things as the voice of the clause. According to Mackenzie (1996:333), “nominalization is relevant not only to the front-to-back relations in discourse, but also right-to-left relations”. This shows that not only nominalization should be considered in mind, but also information (it’s actants) that surrounds the nominalization. Everything that surrounds nominalization is it’s background that shows from what nominalization has originated. The fact that proposition is understood as a sentence which deprived of modality reveals that nominalizations emerge from propositions (Sušinskienė, 2006). However, it should be stressed that the proposition is not an abstract construction, but is realised as a clause. Consequently, “the nominalization is materially related to the clause; semantically it is related to the propositional content of the clause” (Sušinskienė, 2010:144). Due to the fact that nominalization has ties with a clause and proposition, it serves not only as nouns creating method but also maintains cohesion of the sentences.

Verb-based nominalizations according to their inner character of underlying verb are categorized into four types: activity, state, achievement and accomplishment. Vendler (1967:97-121) and Mourelatos (1978:415-434) explained that activity meant a process (durative), state involves no dynamics, the achievement denotes verbs of inception or the climax (end) of a process and accomplishment is understood as verbs that have an end-point built in. Furthermore, according to their denoting kind of process nominalizations are categorized into: 1) material, 2) happening, 3) mental, 4) verbal, 5) relational and 6) existential[[5]](#footnote-5). Moreover, as Sušinskienė (2009:89) states verbs in regard to the semantic properties help to divide nominalizations into imperfective and perfective. Imperfective means that verb-based nominalizations denote activity. While perfective is the group of verb-based nominalizations that represents the result of the event. In addition, it should be noted that based on the proposition two types of nominal expressions are attained: gerundive and non-gerundive. For instance, Chomsky (1980:15) illustrates these two types with the following examples:

(1) *John is eager to please.*

(2) ***John’s being******eager*** *to please*.

(3) ***John’s eagerness*** *to please*.

The first example above is a simple sentence without any nominalizations. While the second sample is the gerundive nominal because the expression *John is eager* is transformed into gerundive nominal *John’s being eager*. The third example shows the derived nominal *John’s eagerness*. Moreover, gerundive nominal expressions and derived nominal expression (i.e. non-gerundive) differ. Chomsky (Ibid.,16) adds that gerundive nominal can slightly be formed free from propositions of subject-predicate form and the meaning between the gerundive and proposition is quite regular. Furthermore, gerundive nominals do not have the internal structure of a noun phrase, whereas the derived nominals have the internal structure of a noun phrase. Also, on the contrary to gerundive nominal, the derived nominal has quite a varied semantic relationship between the associated proposition. In addition, these two groups differ according to their syntactic patterning as gerundive nominalizations structures pattern after verbs while non-gerundive structures pattern after nouns (Sušinskiene, 2006). Meanwhile, Hathaway (1967:243) pointed out that, “for many verbs no abstract noun form other than the gerund exists in the lexicon”. Thus, it can be said that gerundive nominal can derive from any proposition. However, gerunds do not express the substantive process and they should not be treated as a noun proper because they are more verbal than nominal (Chomsky, 1970:184-221; Duffley, 2000:221-248). Even though, gerundive and non-gerundive nominals contrast but the fact that their constructions are related to the same source shows that they have one common feature (Heyvaert, 2003:76). Both: gerundive and non-gerundive nominal expressions are created by applying the process of nominalization.

In conclusion, it can be noted that verb-based nominalizations are closely related with their underlying propositions. Based on the inner character of the underlying verb, verb-based nominalizations express activity, state, achievement and accomplishment. Also, verb-based nominalizations according to their denoting process might be distinguished into material, happening, mental, verbal, relational and existential. According to the semantic feature, nominalizations are divided into imperfective (expressing activity) and perfective (expressing the result of the action). Nominalizations may also occur in the discourse with explicit underlying propositions or with implicit underlying propositions[[6]](#footnote-6). This point discloses that every verb-based nominalization is linked with the context of a discourse and is used to preserve the relations between the sentences.

The following chapter is dedicated to cohesion and coherence because nominalization plays an important role as being a cohesive device.

# COHESION AND COHERENCE

Nowadays, in the world where technologies play an important role in our lives, the language has become more flexible to the changing needs of communication. Some languages are dying; others have undergone various difficulties by absorbing particular expressions of different languages and rejecting its own unique phrases or words that are no longer useable. Today, many linguists as Valeika (1985), Martin (1992), Eggins (2004), and others focus on the spoken or the written text as a whole unit. The primary attention is paid to the connectedness of ideas, due to the fact that comprehension of the discourse plays an important role in learning and perceiving the world as it is. Here the terms *cohesion* and *coherence* come into view.

Trask (2005:40) points that cohesion is the system of explicit linguistic links which ensure the structure of a discourse. Moreover, Crystal (2003:81) suggests that the term cohesion is understood as, “<…> surface-structure features of an utterance or text which link different parts of sentences or larger units of discourse”. Meanwhile, Bussman (2006:199) revealed that cohesion is produced by the following means:

1. the repetition of the text elements (e.g. recurrence, textphoric, paraphrase, parallelism);
2. the compacting of the text by using ellipsis;
3. the use of morphological and syntactic devices which are applied in order to reveal the variety of relationships (i.e. connection, tense, aspect, deixis or theme-rheme relationship).

As viewed by Bussman (2006:198), coherence could be generally understood as, “the grammatical and semantic interconnectedness between sentences that form a text”. While concentrating on a narrower sense it is interpreted as implying the semantic meaning and the basic interconnectedness of the meanings of the discourse. Here the main important aspect is the cognitive structure of a text. We might say, following Trask (2005:39), that coherence helps the text to make sense. Beaugrande and Dressler (1981) cleared the differences between cohesion and coherence. They explained that cohesion refers to the semantic relations in the text; meanwhile coherence is referred to the semantic and pragmatic relations between parts which are explained by bearing in mind the background of specific world knowledge. That is why it is important to distinguish these two terms because cohesion maintains the connection within the text whereas coherence binds the discourse from its’ outside. Mosenthal and Tierney (1984:240-244) mentioned that there is some kind of correlation between the use of cohesive devices and the general coherence or clarity of the text. That is why it is important to mention that the discourse has both: coherence and cohesion.

Halliday and Hassan (1976) expressed the idea that every text has a semantic meaning which refers to relations of meaning that exist within the text. It is important to accept the discourse not only as being structured by sentences but also as being realized by them. This reveals that each sentence has an encoded meaning which unites the whole text. Generally speaking, cohesion might be simply described as the system which consists of relations of meaning that prevails within the text and helps to characterize a piece of writing as a text (Ibid.). Cohesion refers to semantic meaning of grammatical units such as sentences, clauses, word groups within the text while coherence refers to the whole semantic meaning of the text that is created by applying cohesion. When talking about cohesion and coherence, the texture must be mentioned as well. As Martin (2001:35) claims, “cohesion is one aspect of the study of texture, which can be defined as the process whereby meaning is channelled into a digestible current of discourse”. Also, the scholar remarks that texture is considered to be an aspect of the study of coherence, which is known as the process that involves understanding and expectations about the social context of the discourse (Ibid.). It means that texture is a significant component of a discourse and it helps to attain the essential meaning of a text. In general, coherence helps to grasp the basic meaning of the discourse which is created by grammatical and lexical cohesive devices.

In conclusion, coherence of a text is defined as a logico-semantic and informational-pragmatic integration, whereas cohesion of a text is actually the realization of the coherence by applying linguistic means. Also, cohesion is divided into grammatical and lexical classes which have particular cohesive devices. We must bear in mind that both: cohesion and coherence make the discourse a unified piece of various ideas which are related with each other.

## Nominalization as a lexico-grammatical cohesive device in science popular texts

Having discussed cohesion and coherence it is of vital importance to discuss the aspects of nominalization as being lexico-grammatical cohesive device. This phenomenon is understood as a cohesive device because it sustains the language economy by unifying expressions in the text. McCarthy and Carter (1994:90) emphasised that,” cohesion does more than just link sentences and utterances on the surface of the text; it also plays its part in creating genres and registers, and is one of the ‘discourse management’ features that the lexico-grammatical system offers”. This means that a writer decides how the discourse will be segmented and how the textual hierarchy of the discourse will be revealed.

As stated by Verikaitė (1999:5), “although, cohesion is talked of as grammatical and lexical, it is not purely formal relation, it is also semantic relation”. The semantic relation is considered to occur between an element in the text and some other element which is of vital importance for the explanation of the former. Furthermore, Verikaitė adds that these two elements might have a structural relation or may not have (Ibid.). Nominalization as being a cohesive device appears in two types of cohesion: general and specific (Sušinskienė, 2008). Also, nominalizations are divided in the discourse according to their occurrences with explicit or implicit underlying propositions. When it shows general cohesion, nominalization occurs in the title of a text and the source which is the underlying proposition is found somewhere in the text (explicit nominalization). However, this type of cohesion does not connect different sentences but organizes the text sentences into one supraphrasal unit (ibid.). While talking about specific cohesion, the nominalization is preceded or followed by the respective proposition (implicit nominalization). Explicit nominalizations are not as free as implicit ones which are unbounded by co-text and implicit nominalizations do not have an underlying source placed somewhere in the discourse. Moreover, the nominalization that includes one proposition in another reveals that the proposition which contains the nominalization is called the matrix proposition. Also, it should be mentioned that when nominalizations contain a function of serving as a link between the propositions, then they are used as two types of reference: anaphoric and cataphoric. Each type of the reference creates links between distinct expressions.

It should be also claimed that nominalization serves as a lexico-grammatical cohesive device, due to the fact that it reveals lexical (referring to vocabulary) and grammatical (referring to grammar) aspects. Firstly, when it is used as lexical cohesive device then it has a function of condensing information by using fewer words of the vocabulary. Secondly, as a grammatical cohesive device it transforms the word into another one belonging to a different word class and applies grammar rules in order to join two ideas by having the verb in one sentence and the nominalized version of it in the other sentence.

The attention of the text must be directed not only to its semantic meaning but to the genre of the discourse as well. Nominalizations are often used in science popular texts. Popular science is considered as a sub-genre of scientific writing, which has its own unique linguistic features of interaction (Myers 1989, 1990a, 1990b, 1991; Varttala 1999; Calsamiglia 2003; Parkinson and Adendorff 2004). As we all know, science texts are difficult to read and understand as they are written in scientific language that possess various specific terms of items. Furthermore, various science discourses are imposed to scientists or those who have a certain knowledge required in order to understand a particular field of science but not to the ordinary readers. The main reason why the science genre has a sub-genre of popular science is to simplify the science language to the readers that do not have any specific knowledge of scientific matters. As pointed out by Sušinskienė (2012), “the science popular writing is rather personalized, and the main purpose is just to present the information to the readers while in specialized writing the author communicates accurate information to the readers”. Furthermore, science popular texts are also called science popularisation texts. As pointed out by Petrėnienė (2011:5), “science popularisation is perceived as communicational interaction between a scientist and the general public, as presentation of basic knowledge and facts about science and technology to the public in popular and understandable way”. It discloses that scientific text is transformed into less complicated and more easily understandable discourse and is adapted to the daily life experience. Moreover, Petrėnienė observes that short sentences, various expressive units of speech and syntactical figures are used in science popular texts (Ibid.). Consequently they aim at creating a lively, emotional text which attracts the reader’s attention. Nominalizations are used in such science popularization discourse because it contributes not only in making the text coherent but also in integrating information in an economical way.

To conclude this chapter it is important to stress that nominalization also serves not only as a process of creating nouns, but also as a lexico-grammatical cohesive device. In addition to this, nominalizations play an important role in organizing the science popular texts because it contributes to the lexico-grammatical cohesion of the text and to the condensation of information. Science popular texts are illustrative, expressive and the factual information is conveyed in a concise manner due to the use of nominalizations.

As the theory concerning the phenomenon of nominalization has been discussed by applying the descriptive-theoretical literary analysis, now the paper focuses on the practical part of the research. The following chapter is dedicated to the usage of verb-based nominalizations in science popular texts.

# THE USAGE OF VERB-BASED NOMINALIZATIONS IN SCIENCE POPULAR TEXTS

## Methodological considerations

The analysis of the present paper is based on the verb-based nominalizations taken from the online English magazine *Popular science* (see the website http://www.popsci.com/). *Popular science* is an American magazine which is being released monthly. This magazine was founded in 1872 and has been translated into 30 languages and is published in 45 countries. Moreover this magazine covers such topics as gadgets, technology, military, science, medicine, etc. 700 examples of verb-based nominalizations were drawn and examined from 35 articles covering the period from January 8, 2012 to March 27, 2013. All the articles were selected from the topic about global warming.

The intention of this chapter is to analyze verb-based nominalizations that are derived in two ways: 1) by the use of “material” suffixes and 2) by the use of “zero” suffixes. Verb-based nominalizations used in the corpus represented two distinct semantic groups: imperfective and perfective. In addition, nominalizations that denoted processes were distinguished into: **material, happening, mental, verbal, relational** and **existential**. This chapter is dedicated to discuss their semantic and structural features in detail. In order to interpret and examine nominalizations the descriptive-analytical method was applied. Also, the statistical method helped to systemize and generalize the research results.

Firstly, by means of descriptive-analytical method, 700 verb-based nominalizations were identified and classified according to their formation by adding material suffixes and by using zero suffixation. Secondly, all 700 examples of verb-based nominalizations were categorized according to their denoting processes into material, happening, mental, verbal, relational and existential nominalizations. In conformity with denoting processes, nominalizations have semantic and structural features. By the semantic feature, nominalizations fall into imperfective (showing the action) and perfective (showing the result) groups, while by the structural feature nominalizations are divided into absolute and non-absolute. Only 70 verb-based nominalizations were interpreted in detail. The statistical method by applying a spreadsheet program MCExcel 2010 was used to count all the examples and to draw figures which visually disclose the research results.

## Material suffixes

One of the most productive ways by creating nominalizations is suffixation. By adding suffixes to a verb not only the words’ class changes but the semantic words’ class as well. The most common suffixes used in order to create verb-based nominalizations are the following:

*-ance/-ence, -ery, -ing, -ion/-sion/-tion/-ation, -ment, -sis, -th, -ure, -al, -age*.

### 3.2.1 Suffixes -ance/-ence

Marchand (1969:249) pointed out that verb-based nominalizations with the suffix *-ance/-ence* denote deverbal nouns which express the idea of action. For example :

(1) *Communities challenged with too little water, meanwhile, are finding new supplies through conservation and efficiency schemes that feature better metering and pricing of water, restrictions on outdoor water use, retrofitting with water-miserly* ***appliances*** *and fixtures, and reusing grey water to irrigate gardens.* (Elizabeth Royte, *Strategies for a Changing Planet: Water*, 12 June 2012)

(2) *So* ***differences*** *in cloud formation, wrought by a warming climate, could help counteract the effects of that warming.* (Rebecca Boyle, *Earth’s Clouds Are Getting Lower, Which Could Be a Good Thing*,23 February 2012)

In the samples above nominalizations *appliances* and *differences* are formed from the verbs *apply* and *differ* and express the idea of action.

### 3.2.2 Suffix -ery

The suffix *-ery* was generally employed with nominalizations which showed the result of the process. The following samples illustrate this:

(3) *Instead, most advocates favor mechanical aerosol* ***delivery*** *methods.* (Damon Tabor, *Strategies for a Changing Planet: If All Else Fails…*, 12 June 2012)

(4) *She was referring to* ***the discovery*** *and extraction of unconventional shale gas in North America, thanks largely to the controversial process called hydraulic fracturing, which has expanded production and dropped prices of natural gas and made arctic hydrocabons less cost competitive.* (Susan Moran, *As The Earth Warms, The Lure Of The Arctic’s Natural Resources Grows*, 1 February 2013)

### 3.2.3 Suffix -ing

The examples below reveal that the suffix *-ing* was added to the verbs to form nouns denoting:

* process;
* result of something;

PROCESS

(5) *It’s not in doubt that global* ***warming*** *is changing the planet for the worse, but it’s difficult to identify which, if any, specific weather events we can definitively link to it.* (Colin Lecher, *Are Recent Extreme Weather Events Caused By Global Warming? NASA Scientist Says Yes*, 7 August 2012)

In the example above nominalization *warming* reveals the process as it is a continuous action that still proceeds.

RESULT OF SOMETHING

(6) *That’s interesting, but perhaps more intriguing is the idea that this theory could aid in our* ***understanding*** *of where global warming originates and where it is going.* (Clay Dillow, *Global Warming Could Be Linked to the Number of Exploding Stars in the Sky*, 6 September 2012)

In the example 6 we can see that *understanding* discloses the result of perceiving issues about the global warming.

(7) *Still-living victims who emergency workers decided to black-tag, leaving them to their death so they could devote their limited time and resources to helping people who had a chance of* ***surviving****.* (Seth Fletcher, *Did Global Warming Destroyed My Hometown?*, 19 January 2012)

This example reveals that *surviving* indicates the result of staying alive.

### 3.2.4 Suffixes -ion/-sion/-tion/-ation

Verb-based nominalizations with suffixes -ion/-sion/-tion/-ation described:

* state;
* process;
* result of the process.

Consider:

STATE

(8) *His sarcasm seemed to come from a place of exasperation that I happen to share –* ***a frustration*** *with the odd American reluctance to consider the possibility that climate change is not only real, but already contributing to disasters like the one in Japan.* (Seth Fletcher, *Did Global Warming Destroyed My Hometown?*, 19 January 2012)

In the above example we can see that *a frustration* is a nominalization which indicates the state of being frustrated.

PROCESS

(9) *Carbin and his colleagues can often tell days in advance when weather conditions will be right for tornado* ***formation****.* (Seth Fletcher, *Did Global Warming Destroyed My Hometown?*, 19 January 2012)

(10) *In his State of the Union Address, Obama promised execute* ***action*** *to reduce* ***production*** *and fund alternative fuel research.* (Shaunacy Ferro, *Obama’s Finally Serious About Climate Change*, 13 February 2013)

The examples 9 and 10 illustrate the process because the nominalizations *formation, action and production* are continuous acts and are used without any article indicating the result or accomplishment of these acts.

RESULT OF THE PROCESS

(11) *With an average* ***elevation*** *of just five feet above sea level, the Maldives-a nation comprising 1,192 islands in the Indian Ocean-is the lowest country in the world.* (Katharine Gammon, *Building Artificial Islands That Rise With the Sea*, 6 August 2012)

(12) *The aggregate result of all this is* ***a reduction*** *in the ecosystem’s ability to sequester carbon.* (Clay Dillow, *The 2000-2004 North American Drought was the Worst in 800 Years*, 30 June 2012)

In the examples 11 and 12 the articles *an* and *a* expose that nominalizations *elevation* and *reduction* are a completed actions which denote the result of the process.

(13) *So, the theory goes, fewer star* ***explosions*** *equals a warmer atmosphere.* (Clay Dillow, *Global Warming Could Be Linked to the Number of Exploding Stars in the Sky*, 6 September 2012)

(14) *And in the 12 years he’s spent tracking animals with radio and GPS collars, Gehrt, a wildlife ecologist at Ohio State University, has witnessed some remarkable* ***adaptations****.* (John Mahoney, *Why Wild Animals Are Moving Into Cities, And What To Do About It?*, 19 December 2012)

In the example 13 and 14 it is shown that such nominalizations as *explosions* and *adaptions* are the results of such happened processes as exploding and adapting.

### 3.2.5 Suffix -ment

The suffix *-ment* revealed:

* process;
* result of an action;
* object of an action;
* agent of an action.

Consider the examples:

PROCESS

(15) *The trust would divert that funding into the research* ***development*** *of alternative fuel sources to get cars and trucks off oil.* (Shaunacy Ferro, *Obama’s Finally Serious About Climate Change*, 13 February 2013)

In the example above the process is being described because here the nominalization *development* is understood as an action having unlimited duration.

RESULT OF AN ACTION

(16) *A landmark study refines* ***measurements*** *of losses in Greenland and Antarctica and how ice melt is contributing to rising seas.* (Rebecca Boyle, *Scientists Find Clearest Evidence Yet of Monumental Polar Ice Melt*, 29 November 2012)

In this example *measurements* are perceived as the result of an action because the verb *measure* denotes the action and its nominalized form *measurements* contain in itself the meaning of the completion i.e. the result.

OBJECT OF AN ACTION

(17) *Lora Koenig, a Goddard glaciologist and a member of the research team analysing the satellite data, said in* ***a statement****: Ice cores from Summit show that melting events of this type occur about once every 150 years on average.* (Colin Lecher, *In Record Summer Heat, 97 Percent of Greenland’s Surface Ice Turns to Slush*, 25 June 2012)

In this example we can see that *a statement* is accompanied by the article *a*,and this article discloses that this is the object of an action *to state*.

AGENT OF AN ACTION

(18) *The Maldivian* ***government*** *has started a joint venture with the architectural firm Dutch Docklands International to build the world’s largest artificial floating-island project, which will stay above water no matter how many glaciers melt.* (Katharine Gammon, *Building Artificial Islands That Rise With the Sea*, 6 August 2012)

In the example above clearly nominalization *government* plays an important role as article *the* intensifies that. Moreover, *government* is an agent of an action *to govern*.

### 3.2.6 Suffix -sis

Nominalizations with suffix -*sis* denoted a result of the process. The example is given bellow:

(19) ***An analysis*** *in nature has confirmed what we already knew: politicians need to hurry up if we’re going to stop climate change.* (Colin Lecher, *Politics Is Most Important Factor for Climate Future, Study Finds*, 4 January 2013)

The example 19 reveals that *analysis* is the result of the process because article *an* presents that the process *analyze* is completed.

### 3.2.7 Suffix -th

The suffix *-th* mainly created nominalizations that showed both: the process and the result of the process. See the examples below:

PROCESS

(20) *Over the past two decades, scientists have conducted more than a dozen small-scale trials to confirm that iron seeding does indeed stimulate* ***the growth*** *of phytoplankton.* (Damon Tabor, *Strategies for a Changing Planet: If All Else Fails…*, 12 June 2012)

In the example above we can observe that *the growth* is perceived as a continuous action which is not restricted by time.

RESULT OF THE PROCESS

(21) *The Midwest already suffered plenty of severe weather this week, with 30tornado reports and 12* ***deaths*** *Tuesday night and into Wednesday.* (Rebecca Boyle, *Storm Watch: Driven By Warm Air, Massive Tornado Outbreak Forecast for Friday*, 1 March 2012)

In this example *deaths* are understood as the result of the process *to die* and in itself the nominalization *deaths* contain the meaning of the result and cannot be described as the process.

### 3.2.8 Suffix -ure

Verb-based nominalizations with suffix -*ure* described the process and the result of an action:

PROCESS

(22) *The combined* ***pressures*** *of these weather patterns caused an iceberg about half the size Manhattan to break off of the Petermann Glacier and float right through the Nares Strait.* (Krislyn Placide, *A Satellite View of Glacial Melting*, 22 October, 2012)

In the example above *pressures* demonstrate the process of *pressing* something and this action has unlimited duration.

RESULT OF AN ACTION

(23) *The tornado churned on to the east, tagging its path with bizarre* ***signatures****-wood piercing asphalt, rubber piercing wood.* (Seth Fletcher, *Did Global Warming Destroyed My Hometown?*, 19 January 2012)

In this example *signatures* are the nominalized form of the verb *to sign*. In addition, this nominalization in itself bears the meaning of the completed action i.e. the result.

### 3.2.9 Zero derivation

Zero derivation or in other words conversion is a process when a verb changes into a noun without adding any material suffixes. Adams (1973) categorizes three main groups of zero-derived nouns from verbs: 1) the noun denotes the agent of the action expressed by the verb, 2) the noun denotes the concrete object or result of the action and 3) the noun denotes the abstract result of the action. The following examples are provided respectively:

(24) *Climate* ***change*** *has reduced sea ice cover in Hudson Bay, which enables orcas to spend more time there feeding.* (Rebecca Boyle, *5 Creatures That Could Actually Be Helped By A Warming World*, 14 January 2013)

The noun *change* denotes the agent of the action expressed by the verb.

(25) *For most people, animals and plants, a warming planet is generally a bad thing, bringing dramatic climate* ***shifts*** *and* ***changes*** *in ecosystems.* (Rebecca Boyle, *5 Creatures That Could Actually Be Helped By a Warming World*, 14 January 2013)

The example above reveals that such nouns as *shifts* and *changes* are nouns that denote concrete results of the action.

(26) ***The study*** *examined extreme weather events from 1951 to 1980, then compared them with the events between 1980 and 2011.* (Colin Lecher, *Are Recent Extreme Weather Events Caused By Global Warming? NASA Scientist Says Yes*, 7 August 2012)

This instance exposes that the noun *the study* is the abstract result of an action *to study*.

To conclude it could be said that there are various kinds of suffixes that help to create verb-based nominalizations. Such suffixes as -*ance/-ence, -ery, -ing, -ion/-sion/-tion/-ation, -ment, -sis, -th, -ure, -al, -age* are often used to create verb-based nominalizations. In addition, zero derivation (i.e. zero suffixation) is a productive way of verb-based nominalizations.

The frequency of material suffixes and zero suffixation is shown in the table below:

***Table 1.* The relative frequency of the suffixes**

|  |  |  |  |
| --- | --- | --- | --- |
| Suffixation | Raw freq. in the corpus | The freq. per 100 words in a corpus of 19,676 words | Coverage (%) |
| *-Ø (zero suffixation)*  *-ion/-sion/-tion/-ation*  *-ing*  *-ment*  *-th*  *-ure*  *-sis*  *-ance/-ence*  *-ery*  *-al*  *-age* | 296  238  90  40  11  10  7  6  2  0  0 | 1,5  1,2  0,5  0,2  0.06  0,05  0,04  0,03  0,01  0  0 | 42  33  14  6  2  1  1  0,8  0,2  0  0 |
| Total | 700 | 3,59 | 100% |

Using the formula, to calculate absolute frequency of nominalizations occurring per 100 words, the number of nominalizations was divided by the length of the corpus in which they occurred and obtained number was multiplied by 100. For example: (296 nominalizations / 19,676 words) \* 100 = 1,5 nominalizations per 100 words. The frequency calculated using this formula shows how often nominalizations occur (Biber:1988).

The table above reveals that the most frequent were zero suffixation which accounted for 42 per cent (296 tokens). Relatively frequent suffixes were *-ion/-sion/-tion/-ation* and they composed 33 per cent (238 tokens). Also the *-ing* suffix was quite productive as it accounted for 14 per cent (90 tokens). The suffix *-ment* accounted only for 6 per cent (40 tokens). The suffixes *-th* and *-ure* were not very frequent, they only accounted for 2 per cent (11 tokens) and 1 per cent (10 tokens), respectively. The least productive suffixes were *-ance/-ence* and *-ery*. They accounted for 0,8 per cent (6 tokens) and 0,2 per cent (2 tokens), respectively. Such suffixes as *-al* and *-age* were not found at all.

## Material nominalizations

The main semantic components are *processes*, *participants* and *circumstances*. The most important feature is a process which in propositions exists in two modes: 1) **congruent** (i.e. expressed by the finite form of the verb) and **non-congruent** (i.e. expressed by a nominalized form of the verb). Furthermore, verb-based nominalizations according to their inner character of underlying verb are categorized into four types: *activity, state, achievement* and *accomplishment*. Vendler (1967:97-121) and Mourelatos (1978:415-434) stated that *activity* meant a process (durative), *state* has no dynamics, the *achievement* describes verbs of inception or the climax (end) of a process and *accomplishment* reveals the verbs that have an end-point built in.

Material nominalizations denote the processes of ‘doing’ which involve some physical action and show that something is going on the external world. According to Halliday (1994:110), “they express the notion that some entity ‘does’ something - which may be done ‘to’ some other entity”. Consider the following examples taken from Halliday:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *The lion* | *caught* | *the tourist* | *The tourist* | *was caught by* | *the lion* |
| *Actor* | *Process* | *Goal* | *Goal* | *Process* | *Actor* |

From the example above we can see two material processes that are expressed by the verb *catch*. To quote the scholar (1985:104), “if there is a Goal of the process, as well as an Actor, the representation may come in either of two forms: either active, the lion caught the tourist, or passive, the tourist was caught by the lion“. It should be mentioned that participant which carries out the material process is called the **Agent**. As Cruse (1973) observes, *Agents* are characterized by such features as *volitive, effective, initiative* and *force*. In addition, material processes are considered to be causative processes and *Agents* are known as **Causers**. Also, *Agents* might be perceived as showing two types: animate and inanimate. The term **Animate Causer** is designated to present the **Agent** and the term **External Causer** is designated to show an Internal *Causer* (Sušinskienė, 2006). Other participants in a ‘doing’ situation are: the *Affected Patient*, the *Effected Patient*, the *Recipient*, and the *Beneficiary*.

### The semantic features of material nominalizations

According to the inner character of the underlying material process, the verb-based nominalizations may occur with an imperfective (i.e. expressing activity) or a perfective (i.e. expressing result) meaning. To quote Valeika and Sušinskienė (2012:7), “an imperfective process is a process that is still continuing, i.e. a process that has been started but has not reached its end, <…> a perfective process is the opposite of durative process: it is a process that has passed through all the three phases: inceptive (beginning), medial (middle), and terminal (end)”. On the one hand, when the verb expresses activity then the respective nominalization has an imperfective meaning. On the other hand, the verb which denotes the result contains a perfective meaning. Consider the following example:

(27) *Some climate scientists, however, are critical of the analysis, saying* ***the correlation*** *between global warming and specific extreme weather events isn’t great enough to warrant linking them.* (Colin Lecher, *Are Recent Extreme Weather Events Caused By Global Warming? NASA Scientist Says Yes*, 7 August 2012)

The example above illustrates that *the correlation* displays the activity process which is imperfective because it is an unbounded process, i.e. a process that has no built-in end. This process is a continuous as there are no restricted time limits.

(28) ***Measuring*** *ice loss happens in a number of ways*. (Rebecca Boyle, *Scientists Find Clearest Evidence Yet of Monumental Polar Ice Melt*, 29 November 2012)

This example shows that *measuring* is an unbounded process which reveals the activity process and that is the reason why it is an imperfective nominalization.

(29) *Global warming and environmental* ***destruction*** *are driving coyotes, bears and mountain lions out of their habitats, but that’s only part of the reason why so many animals call the city home.* (John Mahoney, *Why Wild Animals Are Moving Into Cities, And What To Do About It*, 19 December 2012)

The example demonstrates that the nominalization *destruction* is imperfective. It describes the unbounded activity process which is a continuous process as it has no restrictions to its duration.

The verb-based nominalizations which derived from propositions denoting accomplishment and achievement material processes that express the completion of the process contain the perfective meaning. However, the accomplishment and achievement processes might be imperfective as well. When accomplishment and achievement processes show inceptive (beginning) and terminal (end) phases of an action that have duration, then they are understood as imperfective. When the completion of the accomplishment and achievement processes are used in the past or in the future tense form (i.e. the processes can be completed in the past or in the future, not in the present), then they express the perfective meaning (Valeika, Sušinskienė:2012). For example:

(30) *The study correlated data from the same places and times, and discarded some outlying* ***observations*** *that couldn’t be cross-checked.* (Rebecca Boyle, *Scientists Find Clearest Evidence Yet Of Monumental Polar Ice Melt*, 29 November 2012)

This example represents the verb-based nominalization *observations* which discloses the accomplishment process. This accomplishment process expresses the completion of the action *to observe* and is perfective in meaning because it denotes the result of the accomplished action.

(31) *The question becomes, to what degree are we going to tolerate the risk, and what kind of* ***adjustments*** *to our lives are we willing to make?” Gehrt says.* (John Mahoney, *Why Wild Animals Are Moving Into Cities, And What To Do About It*, 19 December 2012)

(32) *The orcas drew worldwide* ***fascination*** *and calls for help, but Canadian environmental officials said they had no available icebreaker to cut a path to the sea.* (Rebecca Boyle, *5 Creatures That Could Actually Be Helped By A Warming World*, 14 January 2013)

In the examples 31 and 32 above achievement processes are exposed. Such nominalizations as *adjustments* and *fascination* denote the result (the product) of the process and contain the perfective meaning as they show the successful completion of the process in the future and in the past tense forms respectively.

The relative frequency of perfective material nominalizations and imperfective material nominalizations is given in Figure 1 below:

***Figure 1.* The relative frequency of perfective material nominalizations and imperfective material nominalizations**

In a corpus of 700 examples of verb-based nominalizations, 421 material nominalizations were found. Figure 1 shows that imperfective material nominalizations were the most common. They accounted for 71 per cent (300 tokens), while perfective material nominalizations accounted for 29 per cent (121 tokens).

### The structural features of material nominalizations

Nominalizations represent propositions and when a proposition is transformed into nominal form, we may or may not preserve its constituents: participants and circumstances. Nominalizations that are used with ‘zero’ modifications are referred to as absolute nominalizations and those with ‘material’ modifications are referred to as non-absolute nominalizations (Sušinskienė, 2006:56). Absolute material nominalizations could be generally described as being nominalizations with unactualized participants and circumstances. Consider absolute nominalizations:

(33) ***Finding*** *and* ***measuring*** *them was made possible by a special device rigged up by Sandia researchers at Lawrence Berkeley National Labs’ Advanced Light Source, which allowed them to discern the formation and eliminate other similar molecules that contain the same atoms but in a different structure.* (Clay Dillow, *Existence Finally Confirmed of Hypothetical Particle That Could Help Cool the Planet*, 12 January 2012)

(34) *President Obama promised to make meaningful* ***progress*** *on the issue of climate change in the State of the Union Address last night.* (Shauncy Ferro, *Obama’s Finally Serious About Climate Change*, 13 February 2013)

In the instances above we can see that such actions as *finding*, *measuring* and *progress* have not been accompanied by articles. Due to the fact that they are seen as material nominalizations having unactualized participants and circumstances.

Consider non-absolute nominalizations:

(35) *Nonetheless, it wasn’t until the morning that we realized that* ***the damage reports*** *that had been streaming in over Facebook weren’t isolated.* (Seth Fletcher, *Did Global Warming Destroy My Hometown?*, 19 January 2012)

In this sample, the definite article *the* is generally treated as cohesive but according to Mathesius (1975:52), “is due to purely conceptual lexical reasons”. Here the definite article marks ‘subsequent reference’, e.g. *a report - the report*. If so, the noun *damage*, which in fact denotes given information ( *to damage - a damage*), must be preceded by the definite article. The expression *the damage reports* is the nominalized material process of the phrase *to report damages*. Also it is a non-absolute nominalization because it has an article.

Other examples of non-absolute nominalizations are given below:

(36) *The researchers behind the study knock down* ***the excuse*** *that waiting until scientific and technological uncertainties are cleared up is worth delaying action.* (Colin Lecher, *Politics Is Most Important Factor For Climate Future, Study Finds*, 4 January 2013)

The example above is non-absolute nominalizations as it has article which emphasizes the main action and attract attention to it (i.e. *the excuse*).

Valeika and Buitkienė (2003:61) noted that, “besides the article, the noun can be determined by pronouns (*all, any, some, other, each, every, either, neither, no; this/that, these/those; my, your, his, her, its; our, their; much/many; little/a little; few/ a few; several*), numerals (*one, two; first, second*, etc.), and a genitive noun (*John’s coat*). Consider:

(37) ***These manipulations*** *will become more difficult as we hit economic and physical limits*. (Elizabeth Royte, *Strategies for a Changing Planet: Water*, 12 June 2012)

(38) ***Their conclusion*** *is based in part on abrupt temperature changes in the overall temperature contrast between Greenland and Antarctica, according to a Cambridge news release.* (Rebecca Boyle, *Human CO2 Emissions Could Avert the Next Ice Age, Study Says*, 8 January 2012)

In the examples above we can notice that pronouns *these* and *their* are respectively used with such nominalizations as *manipulations* and *conclusion*. These pronouns help to determine the nouns and disclose the examples of non-absolute nominalizations.

The relative frequency of absolute nominalizations and non-absolute nominalizations is illustrated in the figure below:

***Figure 2.*** **The relative frequency of absolute nominalizations and non-absolute nominalizations.**

In the corpus of 421 material nominalizations, non-absolute nominalizations dominated. They accounted for 70 per cent (295 tokens). Absolute nominalizations used in the corpus accounted for 30 per cent (126 tokens).

## Happening nominalizations

Another important type of verb-based nominalizations’ is called happening nominalizations. This kind of process is not carried out by a participant but rather reveals what happened to a participant (Sušinskienė, 2006:61). In a situation like *The cat died* the participant is not revealing an action, on the contrary what happed to a participant is being described. Downing and Locke (1992), Valeika (1998) do not separate the process of happening but shows a distinction between **voluntary** and **involuntary** processes. In addition, Halliday (1985) excludes behavioural process as a separate type of happening process and states that it is considered to be a typically involuntary. Those sentences that express voluntary process are *Agent*-controlled, but sentences demonstrating involuntary process are not *Agent*-controlled. Normally, happening nominalizations describe the end of the process, however if it is used as an accomplishment then in express the middle phase of the process.

As already stated, behavioural processes belong to happening processes. Halliday (1985) pointed out that these processes are as a “half-way house” between material and mental processes. As behavioural processes like material processes include participant and usually they include just one participant who is called the **Behaver**. Despite the fact that behavioural processes are referred to as typically involuntary, however when they are used with the intension of the Behaver they become voluntary. For instance: *She coughed nervously* (involuntary) while *She coughed discretely* (voluntary). It should be noted that behavioural processes indicate processes of physiological and psychological behaviour.

### The semantic features of happening nominalizations

According to their lexical properties of the underlying verb, happening nominalizations can denote an imperfective or a perfective process. Imperfective nominalizations are those that derive from accomplishment verbs and express the middle phase of a process. Perfective nominalizations arise from accomplishment process which denotes the final phase of the process.

(39) *Altogether the tornado destroyed 6,954 homes and caused at least $3billion in* ***damage****.* (Seth Fletcher, *Did Global Warming Destroy My Hometown?*, 19 January 2012)

(40) *If it’s impossible to prove* ***causation****, it’s easy to see a disturbing correlation.* (Seth Fletcher, *Did Global Warming Destroy My Hometown?*, 19 January 2012)

The examples above reveal the perfective happening nominalizations such as *damage, causation* because they show the final phase of the process (i.e. the result of such processes as *damaging* and *causing* ). Moreover, these nominalizations are non-progressive and this also reveals their perfective meaning.

(41) *It holds the county’s all time heat* ***record*** *from January 1960, of 50.7 degrees Celsius.* (Shaunacy Ferro, *Is Climate Change Self-Correcting? Australia’s Heatwave Stops Gasoline Sales*, 11 January 2013)

(42) *Gehrt’s* ***report*** *urges anyone who spots a coyote to shout, throw rocks, or even shoot it with a paintball gun.* (John Mahoney, *Why Wild Animals Are Moving Into Cities, And What To Do About It*, 19 December 2012)

The examples above denote happening nominalizations of achievement and they are perfective because *record* and *report* disclose the result of the process.

Consider the examples of imperfective nominalizations:

(43) *The most natural way to determine whether global warming is altering tornado patterns is to look for* ***changes*** *in tornado statistics and then see whether climate models can explain those* ***changes****.* (Seth Fletcher, *Did Global Warming Destroy My Hometown?*, 19 January 2012)

This instance reveals the imperfective happening nominalizations as it describes the middle phase of a happening process. The process is progressive as there is no end point for the action.

(44) ***The melting*** *isn’t a one-off event; every summer Greenland’s ice melts some amount.* (Colin Lecher, *In Record Summer Heat, 97 Percent of Greenland’s Surface Ice Turns To Slush*, 25 June 2012)

This example discloses the imperfective happening nominalization because it reveals the middle phase of the process. Also, it describes the unbounded activity process which is a continuous process as it has no restrictions to its duration.

The relative frequency of perfective happening nominalizations and imperfective happening nominalizations is illustrated in the figure below:

***Figure 3.*** **The relative frequency of perfective happening nominalizations and imperfective happening nominalizations**

As we can see from the figure above, imperfective happening nominalizations were the most frequent. They accounted for 71 per cent (145 tokens). Perfective nominalizations composed only 29 per cent (60 tokens). In the corpus of 700 samples of verb-based nominalizations, happening nominalizations were the second most common type of nominalizations as 205 examples of them were discovered in the corpus.

### The structural features of happening nominalizations

Happening verb-based nominalizations according to their structural features appear as absolute and non-absolute. Consider:

(45) *While the Artic seas are extremely productive, they are also very satisfied, meaning there’s not much vertical* ***mixing*** *of nutrients in the ocean.* (Susan Moran, *In An Era Of Climate Change, Where Will The Fish, And The Money, Go?*, 25 January 2013)

(46) *As* ***warming*** *and* ***thawing*** *continue scientists expect the water column to be more stratified, which will prevent nutrients from percolating up to the surface.* (Susan Moran, *In An Era Of Climate Change, Where Will The Fish, And The Money, Go?*, 25 January 2013)

The examples above reveal absolute nominalizations of happening processes because *mixing, warming, thawing* are not accompanied by the articles. Moreover, these are involuntary processes as their as they are not accompanied by the articles. Moreover, these are involuntary processes as they are not *Agent*-controlled, and these processes are uncountable.

The examples below show non-absolute happening nominalizations:

(47) *This optimistic, even celebratory, outlook on* ***the expected impacts*** *of global warming on the High North-which is warming faster than any place on Earth- runs counter to what most scientists and environmentalists say is unfolding there.* (Susan Moran, *As The Earth Warms, The Lure Of The Arctic’s Natural Resources Grows*, 1 January 2013)

(48) *But* ***that demarcation*** *would exclude a large swath of Greenland and ice-covered stretches of Canada.* (Susan Moran, *As The Earth Warms, The Lure Of The Arctic’s Natural Resources Grows*, 1 January 2013)

These examples illustrate that such article as *the* and the pronoun *that* present non-absolute nominalizations which determine nouns that are countable.

The relative frequency of absolute happening nominalizations and non-absolute happening nominalizations is seen in the figure below:

***Figure 4.* The relative frequency of absolute happening nominalizations and non-absolute happening nominalizations**

The figure above illustrates that non-absolute happening nominalizations dominated. They composed 84 per cent (172 tokens of 205 examples of happening nominalizations), while absolute nominalizations accounted only for 16 per cent (33 tokens of 205 examples of happening nominalizations).

## Mental nominalizations

Mental processes are very important as they describe such processes of feeling, thinking and perceiving. Halliday (1985:107) categorized the three subtypes as processes of perception, cognition, and affection. The process of perception is understood as receiving the perception of something through five senses, i.e. sight, touch, taste, smell, and hearing. Valeika postulates that, “Perception is an involuntary state which cannot be controlled or manipulated by the perceiver. The perceiver in fact receives or is affected by the sensations” (1998:41). That is the reason why the process is presented by the verbs of physical perception, e.g. *see, taste, smell, hear, feel,* etc. The other subtype of mental nominalizations is called the process of cognition which is actually the process of knowing. This process is expressed by the stative verbs: *believe, doubt, guess, know, recognize, forget, mean, remember, understand, think*, etc. The process of affection which means showing feelings is realized by the verbs: *like, love, dislike, hate, enjoy, please, delight, distress, detest, want,* etc. To quote Halliday (1976:164), “mental process clauses are characterized by their being associated (1) with different participant functions and (2) with different circumstantial elements from action clauses”. The participant in mental process is called the **Senser**, or the **Recipient Experiencer** who likes, knows, perceives, etc. Usually, there is a second participant known as the **Phenomenon** which is perceived, know, liked, etc. (Sušinskienė, 2006:68)

### The semantic features of mental nominalizations

In the corpus under investigation, mental nominalizations were derived from the three subtypes of mental process: perceptive nominalizations (e.g. feeling, observation, glance, etc.), cognitive nominalizations (e.g. remembrance, understanding, consideration, assumption, etc.), and affectivity nominalizations (e.g. ignorance, tolerance, approval, dislike, etc.). Also, mental verb-based nominalizations expressed perfective or imperfective process.

***Perceptive nominalizations:***

(49) *The research, presented from several North American universities and supported by the likes of NASA, the National Science Foundation, the Department of Energy, and other institutions, doesn’t make* ***a call*** *on whether the ongoing drought in the Midwest is tied to the same forces that fueled the 2000-2004 drought.* (Clay Dillow, *The 2000-2004 North American Drought Was The Worst In 800 Years*, 30 June 2012)

(50) *Like many other towns, Joplin’s policy is to sound a three-minute siren when a storm with winds stronger than 75 mph is approaching town, regardless of whether an NWS agency has issued* ***a watch*** *or warning.* (Seth Fletcher, *Did Global Warming Destroy My Hometown?*, 19 January 2012)

The samples above present perceptive nominalizations which are perfective as they show the result of the accomplishment. Such nominalizations as *a call* and *a watch* are the accomplished results of *calling* and *watching* processes.

***Cognitive nominalizations:***

(51) *In displays on water and weather I could find no* ***consideration*** *of climate change- the defining natural-science challenge of our time.* (Colin Lecher, *Dallas’s New $185 Million Science Museum Looks Ahhhh-mazing*, 12 February 2013)

(52) *It’s not in* ***doubt*** *that global warming is changing the planet for the worse, but it’s difficult to identify which, if any, specific weather events we can definitively link to it.* (Colin Lecher, *Are Recent Extreme Weather Events Caused By Global Warming? NASA Scientis Says Yes*, 7 August 2012)

These instances above are cognitive nominalizations which are created of stative verbs such as *to consider-consideration, to doubt-a doubt*. Moreover, they also express a continuing process and are perceived as imperfective nominalizations, because they show an activity that are continuous.

***Affectivity nominalizations:***

(53) *For all* ***the concern*** *among scientists, environmentalists and others about how melting ice in the Artic could wreak havoc on local ecosystems, the loudest message about climate change among politicians and energy industry officials who spoke at the Artic Frontiers conference in Tromso recently could be summed up as “Bring it on!”.* (Susan Moran, *As The Earth Warms, The Lure Of The Arctic’s Natural Resources Grows*, 1 February 2013)

(54) *“Some may still deny* ***the overwhelming******judgment*** *of science, but none can avoid the devastating impact of raging fires, and crippling drought, and more powerful storms,” he said in his inaugural address in January.* (Shaunacy Ferro, *Obama’s Finally Serious About Climate Change*, 13 February 2013)

These samples represent affectivity nominalizations because they express the feelings. Also these examples of mental nominalizations are imperfective (i.e. denoting a continuing process of activity).

The relative frequency of perceptive mental nominalizations, cognitive mental nominalizations and affectivity mental nominalizations is given in the Figure below:

***Figure 5.* The relative frequency of perceptive mental nominalizations, cognitive mental nominalizations and affectivity mental nominalizations**

The frequency of mental nominalizations was much lower as compared to material and happening. Only 38 examples of mental nominalizations were found in the corpus of 700 examples of all verb-based nominalizations. Activity nominalizations and cognitive nominalizations were the most common. They accounted respectively for 37 per cent (14 tokens) and 34 per cent (13 tokens). Perceptive mental nominalizations accounted for 29 per cent (11 tokens).

The figure above illustrates the frequency of perfective mental nominalizations and imperfective mental nominalizations.

***Figure 6.* The relative frequency of perfective mental nominalizations and imperfective mental nominalizations**

As we can see from the figure above, imperfective mental nominalizations dominated as they accounted for 74 per cent (28 tokens). Perfective mental nominalizations accounted only for 26 per cents (10 tokens).

### The structural features of mental nominalizations

Mental nominalizations are similar to material and happening nominalizations as they are also used in two forms: absolute and non-absolute. Consider:

(55) *Researchers don’t know yet if this will contribute to sea levels rising in Greenland, but if it happens again in the next few years, that could threaten the stability of the ice sheet, which would mean major cause for* ***concern****.* (Damon Tabor, *Strategies For A Changing Planet: If All Else Fails…*, 12 June 2012)

This is the sample of absolute nominalization as there are no articles that could determine the nominalization **concern**.

(56) *That’s interesting, but perhaps more intriguing is the idea that this theory could aid in* ***our understanding*** *of where global warming originates and where it is going.* (Clay Dillow, *Global Warming Could Be Linked To The Number Of Exploding Stars In The Sky*, 6 September 2012)

(57) *When a large predator loses* ***its instinctive fear*** *of humans, after all, that animal becomes more likely to attack.* (John Mahoney, *Why Wild Animals Are Moving Into Cities, And What To Do About It*, 19 December 2012)

These instances above are non-absolute nominalizations as they are marked by pronouns *our* and *its*. Consider:

The relative frequency of absolute mental nominalizations and non-absolute mental nominalizations is shown in the Figure 7 below:

***Figure 7.* The relative frequency of absolute mental nominalizations and non-absolute mental nominalizations**

Figure 7 reveals that absolute mental nominalizations were more frequent than non-absolute mental nominalizations. They accounted respectively for 68 per cent (26 tokens) and 32 per cent (12 tokens).

## Verbal nominalizations

Verbal process nominalizations are those which denote the processes of saying and communicating and consists of such verbs as *tell, announce, declare, ask, report, inquire, suggest, mention, state,* etc. Halliday noted that, “verbalization clauses differ from the others in that they accept only reports, not facts, as ‘processed’ phenomena: naturally, since they are ‘reporting clauses’ (1976:167). Typically, a verbal process contains three participants: the **Sayer**, the **Recipient**, and the **Verbiage**.

### The semantic features of verbal nominalizations

Verbal nominalizations occur as perfective nominalizations presenting the result of the process. Consider:

(58) *After a cursory* ***discussion*** *of our impressions of the damage- “Can you believe this?”.* (Seth Fletcher, *Did Global Warming Destroy My Hometown?*, 19 January 2012)

(59)*“No, not really”-* ***conversation*** *turned to a reunion-style catching up.* (Seth Fletcher, *Did Global Warming Destroy My Hometown?*, 19 January 2012)

(60) *In Nevada, for example, bear- proofing garbage cans and dumpsters has helped decrease* ***complaints*** *by two thirds since 2008.* (John Mahoney, *Why Wild Animals Are Moving Into Cities, And What To Do About It*, 19 December 2012)

These samples above reveal the result of an action which is perceived as an achievement (i.e. *discussion, conversation, complaints*). These nominalizations are perfective in meaning as they present the result of the achieved action which has no continuity.

Also, verbal nominalizations occur as imperfective showing the action. For example:

(61) *But that also led to an awkward moment when CNN anchor Deb Feyerick tried to segue into* ***talking*** *about a near-Earth asteroid that’s expected to fly relatively close to Earth later this week by asking: What’s coming our way? Is this the effect of, perhaps, global warming?* (Colin Lecher, *CNN Anchor Wonders To Bill Nye: Is A Near-Earth Asteroid The Effect Of Global Warming?*, 11 February 2013)

In this instance we can see that nominalization *talking* reveals a continuing action of activity which still progresses.

The relative frequency of perfective verbal nominalizations and imperfective verbal nominalizations is given in the Figure 8:

***Figure 8.*** **The relative frequency of perfective verbal nominalizations and imperfective verbal nominalizations**

In the corpus of 700 samples of verb-based nominalizations, the verbal nominalizations amounted only for 29 examples. In the figure above we can that imperfective verbal nominalizations were more common than perfective nominalizations. They accounted respectively for 55 per cent (16 tokens) and 45 per cent (13 tokens).

### The structural features of verbal nominalizations

Processes of saying and communicating were used in the corpus as absolute and non-absolute. Also, verbal nominalizations are associated with the *Sayer* and the *Verbiage*. Consider absolute nominalizations:

(62) *Legal, political, economic, social and environmental* ***considerations*** *aside, the plan is highly complex and, if history is any guide, would precipitate more problems than it solved.* (Elizabeth Royte, *Strategies For A Changing Planet: Water,* 12 June 2012)

This instance reveals the process of communicating as is considered to be absolute verbal nominalization because there are no determine articles. Consider the non-absolute examples below:

(63) *But* ***a debate*** *persists about why this is so, and whether it’s because of temperature itself or because of indirect results, like food abundance and conservation of heat energy*. (Rebecca Boyle, *Hot Weather Makes Mammals Smaller, So Will Global Warming Make Us Shrink*, 23 February 2012)

(64) *But* ***the explanation****-that pulling water from the ground and putting it into the oceans might contribute to rising sea levels-is just simple enough seem credible, no?* (Clay Dillow, *Pumping Well Water Out Of The Ground May Be A Culprit In Rising Sea Levels*, 23 May 2012)

(65) *In Joplin,* ***a common explanation*** *for abnormal weather is “It’s all cyclical”.* (Seth Fletcher, *Did Global Warming Destroy My Hometown?*, 19 January 2012)

These instances reveal the communicating and the saying processes and they are marked by articles which disclose that these verbal nominalizations are non-absolute.

The relative frequency of absolute verbal nominalizations and non-absolute verbal nominalizations is shown in the figure below:

***Figure 9.* The relative frequency of absolute verbal nominalizations and non-absolute verbal nominalizations**

This figure discloses that non-absolute verbal nominalizations were more commonly used than absolute verbal nominalizations. They accounted respectively for 59 per cent (17 tokens) and 41 per cent (12 tokens).

## Relational nominalizations

Relational nominalizations denote the process of ‘being’. Valeika and Buitkienė (2006:83) declared that generally relational process refers to the processes which express the notion of being something, having something and being somewhere. According to Sušinskienė (2006:77), relational process sentences fall in three categories:

1. **Intensive** (or Attributive) ‘x is a’ (e.g. *Mary is nice*);
2. **Possessive** ‘x has a’ (e.g. *John has a car*);
3. **Circumstantial** ‘x is at a’ (e.g. *Mary and John are in the room*);

Also relational processes constitute two different modes (Halliday, 1985:112; Leckie-Tarry, 1995:112):

1. **Attributive** ‘a is an attribute of x’ (e.g. *This boy is a fabulous piano player*).
2. **Identifying** ‘a is the identity of x’ (e.g. *The girl in the room is my daughter*);

The process of rational propositions is revealed by semi-notional verbs such as *be, become, have,* etc. These verbs are obligatory followed by adjectives or nouns functioning as *Attributes*. Moreover, such verbs resist the process of non-gerundive nominalization, e.g. *The country is strong* turns into *The being strong of the country*; *The country has oil* turns into *The country having oil* (Sušinskienė, 2006:78).

The participant of the Attributive sub-type of relational nominalizations is called the **Carrier** and the property is called the **Attribute**. *Attributive* propositions are not reversible while nominalizations of Identifying sub-type are reversible. There are two participants of Identifying sub-type: a **Token** (an entity which is being described) and a **Value** (an entity which is defined) (Halliday, 1985:115). Even though relational processes are perceived as processes of ‘being’, there are other verbs than ‘be’ that identify the processes, such as *equal, add up to, make, come out at, signify, mean, define, spell, indicate, express, suggest, act as, symbolize, play (a role), represent, stand for, refer to,* etc. (Ibid., 116). Attribute processes are expressed by such verbs as *be, appear, get, grow, continue, keep, turn, hold, prove, turn out, rank, remain, run, fall, stand, go,* etc.

### The semantic features of relational nominalizations

Relational verb-based nominalizations may which occurred in the corpus expresses a stative (imperfective) process. For example:

(66) *It would require unprecedented* ***cooperation*** *among China, the European Union and U.S.* (Damon Tabor, *Strategies For A Changing Planet: If All Else Fails…*,12 June 2012)

This instance reveals a stative process and discloses an imperfective nominalization because it is a progressive action which has an unlimited duration.

Only 4 relational nominalizations were found in the corpus of 700 nominalizations. All of them were imperfective relational nominalizations.

### The structural features of relational nominalizations

Relational nominalizations occurred in the corpus as non-absolute. Consider:

(67) *But if it’s impossible to prove causation, it’s easy to see* ***a disturbing correlation****.* (Seth Fletcher, *Did Global Warming Destroy My Hometown*, 19 January 2012)

This instance reveals a non-absolute nominalization as there is article *a* which marks the noun.

Only 4 relational nominalizations were found in the corpus of 700 nominalizations. All of them were non-absolute relational nominalizations.

## Existential nominalizations

As Thompson points (1997:101), existential processes are defined in negative terms, “essentially it expresses the mere existence of any entity without predicating anything else of it”. It could be said that existential nominalizations denote the existence of somebody or something.

As Sušinskienė (2006:83) observes, verb-based nominalizations describing the existential process typically involve the presentative *There*, which is often followed by such verbs as *be, exist, stand, lie, stretch, hang, remain, occur, follow, appear, arise, emerge, loom* and a nominal group. However, it should be stressed that *There* is not a participant, it only functions as formal *Subject* and has a function of presentative (Ibid.). Existential clauses have the **Existent** which is only one obligatory participant which may be *human* or *non-human*.

Existential nominalizations found in the corpus were mostly based on presentative existential propositions, i.e. propositions based on such verbs as *exist, appear, occur*.

### The semantic features of existential nominalizations

Only two types of existential nominalizations were found in the corpus: stative and dynamic. Consider:

(68) *It’s been a while since he tried to count them all, but Stan Gehrt estimates that more than 2,000 coyotes make* ***a comfortable living*** *in the Chicago metropolitan area today.* (John Mahoney, *Why Wild Animals Are Moving Into Cities And what To Do About It*, 19 December 2012)

The example above is an imperfective nominalization because it describes a dynamic process of an activity which still continues.

Only 3 samples of existential nominalizations were discovered in the corpus of 700 nominalizations. All the examples are imperfective existential nominalizations.

### The structural features of existential nominalizations

Existential nominalizations were used in two forms: absolute and non-absolute. Consider:

(69) ***Existence*** *finally confirmed of hypothetical particle that could help cool the planet*. (Clay Dillow, *Existence Finally Confirmed Of Hypothetical Particle That Could Help Cool The Planet*, 12 January 2012)

This sample above is an absolute existential nominalization as it has no marking article, whereas the sample below is a non-absolute existential nominalization which has a marking article *the*. Consider:

(70) *As we enter the high season of electoral politics, you’re going to hear things about* ***the existence*** *of global warming that may seem a bit dubious--that it doesn’t exist, that it exists and George W. Bush invented it, that cataclysmic climate change has already occurred and we are all doomed, that climate change is the result of the failed stimulus, etc.* (Clay Dillow, *Global Warming Could Be Linked To The Number Of Exploding Stars In The Sky*, 6 September 2012)

The relative frequency of absolute existential nominalizations and non-absolute existential nominalizations is given in Figure:

***Figure 10.* The relative frequency of absolute existential nominalizations and non-absolute existential nominalizations**

Figure 10 illustrate that absolute existential nominalizations accounted for 33 per cent (1 token). Meantime, non-absolute existential nominalizations were more frequently used and accounted for 67 per cent (2 tokens).

To conclude this chapter, we could say that material nominalizations were the most common in the corpus of 700 examples because it accounted for 421. Happening nominalizations were also frequently used, they composed 205 examples. Mental and verbal nominalizations were less frequent, they accounted respectively for 38 and 29 examples. The least commonly used nominalizations were relational (4 examples) and existential (3 examples). A tendency occurred that according to the semantic feature of nominalizations, imperfective nominalizations were more often used than perfective nominalizations. Based on the structural feature of nominalizations, non-absolute nominalizations dominated in the corpus, while absolute nominalizations were less frequent.

# CONCLUSIONS

Nominalization is a unique phenomenon which plays an important role in science popular texts. When talking about a discourse it is important to mentions that a text has both: cohesion and coherence which unites the text in one meaningful unit. Here nominalization comes in view as it helps not only to maintain the text concisely but also aids in uniting different ideas.

The conclusions presented below are the confirmation of the objectives formulated on page 3: 1) To present the theoretical material concerning the features of nominalization; 2) To discuss cohesion and coherence because nominalizations play an important role as being lexico-grammatical cohesive device in science popular texts; and 3) To analyse the usage of verb-based nominalizations in science popular texts and to interpret their semantic and structural features. Finally, the following conclusions have been made:

1. The analysis of the theory discloses the concept of nominalization which is a process of creating nouns from other word classes (i.e. verbs, adjectives, adverbs, etc.). Moreover, it was revealed that the biggest source of nominalizations is created from verbs which are distinguished by a) morphologically identical with agnate verb (e.g. haul, estimate, change); b) nominalizations which have no agnate verb, but which nevertheless designate a process (e.g. occasion, preference, reading), c) nominalizations which have an agnate verb, but are not morphologically identical. Also the discussed theory expressed the idea that nominalizations may also be perceived as the form of grammatical metaphor. When the nominalizations are treated as grammatical metaphors they transform the realization of the process, attribute, circumstance and situation into the realization of being a thing. It was found out that according to their denoting kind of process nominalizations are categorized into: 1) material, 2) happening, 3) mental, 4) verbal, 5) relational and 6) existential.
2. When talking about nominalizations cohesion and coherence should be borne in mind because they help to maintain the texture of the discourse. Coherence of a text is defined as a logico-semantic and informational-pragmatic integration, whereas cohesion of a text is actually the realization of the coherence by applying linguistic means. And nominalization is one of lexico-grammatical cohesive devices which plays an important role in providing the united meaning of the text and creating the condensation of information. Moreover, the analyzed theory disclosed that nominalizations are frequently used in science popular texts. Science popularisation texts are scientific texts applied for an ordinary reader and the scientific language is transformed into more easily understandable by applying various expressive means. The main idea of science popular texts is to provoke an intellectual and evaluative response in the reader. Nominalizations are used in science popularisation discourse as a cohesive device which condenses information and makes the text more economical.
3. The usage of 700 examples of verb-based nominalizations in science popular texts was analysed. The examples of verb-based nominalizations were found in the corpus of 35 articles concentrating on the topic global warming. The most common suffixes used in order to form verb-based nominalizations were the following: *-ance/-ence, -er/-or, -ery, -ing, -ion/-sion/-tion/-ation, -ment, -sis, -ure, -th.* Even though the suffixes *-al* and *-age* are used to form nominalizations, there were no examples found in the corpus. Also, zero derivation was commonly used to create verb-based nominalizations. In addition, verb-based nominalizations that denoted processes were distinguished into: *material, happening, mental, verbal, relational*and*existential.* In the corpus the most frequently used were material and happening nominalizations. Material nominalizations composed 421examples, while happening nominalizations 205examples. Mental and verbal nominalizations were not so common. Respectively, there were found 38 and 29examples of them. The least frequent process nominalizations were relational only 4 examples found and existential only3 examples. Also, their semantic and structural features were discussed. The semantic aspects showed that imperfective verb-based nominalizations (i.e. expressing activity) rather than perfective verb-based nominalizations (expressing the result) dominated in science popular texts. Moreover, structural features of verb-based nominalizations revealed that non-absolute nominalizations (i.e. determined by the article) were more frequently used than absolute nominalizations (i.e. not determined by the article).

In conclusion, it could be said that verb-based nominalizations are unique devices that help to maintain the text coherent and cohesive. Also, it aids in providing economy to the text as it helps to condense information. Finally, having analyzed semantic and structural features of verb-nominalization it can be noted that nominalization should be brought forward in future analysis of linguistic research in other genres of language.

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34. *Scientists Engineer Extreme Microorganisms To Make Fuel From Atmospheric Carbon Dioxide*. By Colin Lecher. Posted 03.27.2013
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1. In this research paper only verb-based nominalizations will be discussed in depth. [↑](#footnote-ref-1)
2. Cohesion and Coherence is discussed in detail in Chapter 2. Cohesion and Coherence. [↑](#footnote-ref-2)
3. Online Longman Dictionary of Contemporary English available from: http://www.ldoceonline.com/. Accessed on 4 January, 2013. [↑](#footnote-ref-3)
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5. Nominalizations showing different kinds of processes are discussed in Chapter 3. [↑](#footnote-ref-5)
6. Explicit and implicit nominalizations are discussed in the Chapter.2.1 Nominalization as a lexico-grammatical cohesive device in science popular texts. [↑](#footnote-ref-6)