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**REFERENCE AS A GRAMMATICAL COHESIVE DEVICE IN  
SCIENCE RESEARCH ARTICLES**

BACHELOR THESIS

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# INTRODUCTION

The discipline of text linguistics focuses on the meaning and interpretation of texts, and one of internal features of text is cohesion. In the *LDOCE*<sup>1</sup> cohesion is defined as “a close relationship, based on grammar or meaning, between two parts of a sentence or a larger piece of writing”. To better understand what cohesion is one must first be aware of a meaning of a term *text*, as these two terms are inseparable. According to Halliday and Hasan (1976) a passage of language, if it is a unified whole and not a collection of unrelated sentences, is a text. Therefore, if a text is a unified whole, it is hardly possible to exist without cohesion, as cohesion is one way to unify it.

Cohesion in general serves as a connection of the actual words and phrases we see or hear, therefore it is a surface relation. The basic known distinction of cohesion is that of grammatical and lexical. Within the grammatical cohesion four cohesive devices are distinguishable: reference, substitution, ellipsis, and conjunction. This paper focuses on grammatical cohesion, more particularly on reference. Reference functions as a device for the information retrieval. It is an expression that points to a particular object that way creating a relation between that object and what it refers to. That relation is one form of establishing text cohesion.

Cohesion has been investigated by many foreign linguists such as Halliday and Hasan (1976), Beaugrande and Dressler (1981), Baker (1992), Lyons (1995), Yule (1996) as well as the Lithuanian scholars Verikaitė (1999), Valeika (2001), Valeika and Buitkienė (2006). Many great works about cohesion has been written, however there is a need for further investigation, especially of science research articles, as this genre has a particular writing style.

The **object** of the research is reference as a grammatical cohesive device.

The **aim** of the research is to explore referential cohesion in science research articles.

To verify the aim, the following **objectives** have been set:

1. To research and present theoretical material concerning the phenomenon of cohesion.
2. To analyse a number of science research articles for identification of referential cohesion.

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<sup>1</sup> *LDOCE - Longman Dictionary of Contemporary English [online]*

3. To classify selected examples according to the distinctive types of reference.
4. To show the relative frequency of reference in science research articles.

The following research **methods** have been applied in the work:

1. Descriptive-theoretical literary analysis method was used to review scientific literature related to the phenomenon of cohesion and reference.
2. Descriptive-analytical method was applied to investigate and interpret reference as a grammatical cohesive device in science research articles.
3. Descriptive-statistic method was used to present the relative frequency of reference in the works under analysis.

#### **The research materials and scope:**

The instances of reference were selected from the science research articles found in the journal *Body Image* from the study field of psychology. The journal was taken from a full-text scientific database *Science Direct* website. 10 articles from volume 10, issue 1 published January, 2013 were collected for the investigation. Having analysed 10 science research articles overall 6081 examples of reference were identified. The distinction of results goes as follows: 4690 instances of demonstrative reference, 848 instances of personal reference, and 543 instances of comparative reference were found.

#### **The novelty of the research:**

The phenomenon of cohesion has already been analysed by a number of linguists, however it is often centered towards aspects of cohesion within language in general just from different angles. This research paper specializes particularly in one cohesive device, i.e. reference and its occurrences within science research articles. Therefore, it is relevant for the study of referential cohesion, because it provides detailed analysis of the cohesive device and distinguishes certain patterns peculiar to the scientific language.

#### **The structure of the work:**

The research paper consists of an introduction of the paper covering the aim, the raised objectives, the methods and material used, as well as the relevance of the work. Second is the theoretical part covering the topics of coherence, cohesion and its devices. Following is the practical part including methodology in which the usage of reference in the science research articles is examined, and the methods described. Then the section of conclusions determines

whether the aim and objectives were attained. The last sections present a list of references to the used literature, sources, and an annex.

# **I. TEXT COHESION**

## **1.1. Text and Texture**

When speaking of cohesion such terms as ‘text’ and ‘texture’ have to be defined, as cohesion exists within a text. Every language consists of linguistic units: morphemes, words, clauses, sentences, texts. ‘Text’ is defined as a “semantic unit of language in use” (Stubbs, 2002:124). This means that a group of language units cannot form a text if the relation between them is lacking a meaning. A collection of words, clauses, sentences only becomes a text, when they are tied to each other by meaning. To emphasize this point Lyons (1995:263) states that “the units of which a text is composed, whether they are sentences or not, are not simply strung together in sequence, but must be connected in some contextually appropriate way”. Thus, a meaning and logical relation of words and sentences are fundamental aspects of a text.

Text must not be understood only as a lengthy passage of many semantically connected sentences, sometimes it can only be one sentence or even a word. Halliday and Hasan (1976:1) claim that a text can occur in any form spoken or written, prose or verse, it can be a dialogue or a monologue, a single proverb, a whole play, a simple cry for help, etc. Length and form are not as relevant as meaning when defining text. A text must contain particular semantic structure, and this structure is known as cohesion of text sentences. Additionally, meaning has no significance if it is not received by someone; therefore, a text also serves a purpose of communicating the ideas, words, or phrases. Beaugrande and Dressler (1981:11) state that “a text will be defined as a communicative occurrence which meets seven standards of textuality”. They identify these standards as cohesion, coherence, intentionality, acceptability, informativity, situationality, and intertextuality. Textuality is understood as the quality of a text. The linguists affix that if a text is not communicative it cannot be characterized as a text.

Being that ‘text’ is understood as a “unified whole” of any passage spoken or written (Halliday and Hasan 1976:1) - i.e. a unified whole constitutes that sentences that belong to the same text must be linked to each other by meaning - it can be noted that it is not unified if it has no texture. In linguistics a term ‘texture’ is defined as “a property that ensures that the text ‘hangs together’” (Valeika, 2001:68). As noted by the linguist the discourse is defined by its main feature i.e. texture. A text has texture only when it is coherent and cohesive, and if it is

none of those it is not a text. According to *MWD*<sup>2</sup> a texture is defined as, “something composed of closely interwoven elements”. It means the texture ensures that the text is a combination of unified elements. The relation between texture, cohesion and coherence is to be understood as follows “cohesion is one part of the study of texture, which considers the interaction of cohesion with other aspects of texts organization. Texture, in turn, is one aspect of the study of coherence, which takes the social context of texture into consideration” (Schiffrin, *et al.*, 2004:35). To validate this idea Valeika (2001) reminds that there are two levels of texture: 1) deep, or underlying and 2) surface. The deep texture is created by cohesion by applying cohesive devices, while the surface texture is formed by coherence. The next chapter will focus on the more detailed definitions of coherence and cohesion.

When speaking of text and texture linguists Halliday and Hasan (1976:3) refer to the relation between two sentences as a ‘tie’. In short a term ‘tie’ is referred to “one occurrence of a pair of cohesively related items”. Hence, any cohesive device found within two sentences is a tie that links sentences semantically and provides texture. It has already been mentioned that Beaugrande and Dressler (1981) distinguish seven standards of textuality two of which are coherence and cohesion, and without them text is a non-text. Therefore, text only exists, when there are ties that link two or more sentences and provide cohesion. To distinguish a text from a collection of unrelated sentences there must be awareness, whether, the following sentence of a text is related to the preceding sentence semantically.

## **1.2. Coherence and Cohesion**

This chapter focuses on defining and distinguishing coherence and cohesion as they are parts of text quality. Both coherence and cohesion serve a function of connecting. Therefore, speaking of coherence it must be noted that “the connectedness of discourse is a characteristic of the mental representation of the text rather than of the text itself” (Brown, 2005:1555). To support this idea Beaugrande and Dressler (1981:12) write that coherence is a linguistic phenomenon concerning “the ways in which the components of the textual world, i.e., the configuration of concepts and relations which underlie the surface text, are mutually accessible and relevant.”, whereas cohesion “the ways in which the components of the surface text, i.e. the actual words we hear or see, are mutually connected within a sequence”. Therefore, coherence is

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<sup>2</sup> *MWD – Merriam Webster Dictionary [online]*

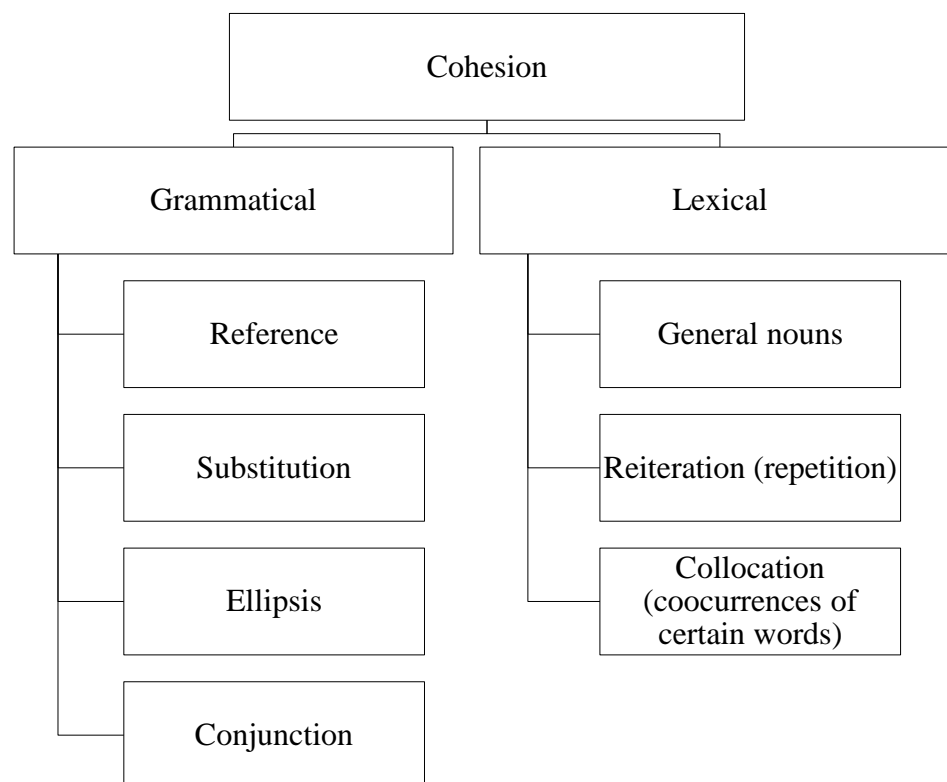
what makes text logical and understandable, despite its grammatical forms, when cohesion provides logic by the use of grammatical forms, i.e. cohesive devices. Valeika and Buitkienė (2006:168) suggest that:

*The relatedness of text sentences has three aspects: 1) informational-pragmatic; 2) semantic; 3) structural. The first two aspects could be reformulated as the logical relatedness, or coherence of the text sentences; the third aspect, which concerns the linguistic realization of coherence, as the cohesion of the text sentences.*

In other words, coherence can be explained as a sequence of rational ideas that connects the text and gives it meaning, while cohesion a sequence of grammatical dependencies of the ideas.

Another important factor in distinguishing cohesion from coherence is objectivity. Cohesion is an objective matter as every reader or hearer of a particular text reads or hears the information and understands it the same where cohesion is concerned. The reader or hearer cannot ignore grammatical aspects and interpret the discourse anything other than it is. Phillis (1983:12), as cited in Verikaitė (1999), writes that “cohesion is objective, capable in principle of automatic recognition”; however, as coherence does not depend upon grammatical forms and is a psychological process it is “subjective and judgements concerning it may vary from reader to reader”. Accordingly, coherence and cohesion do not exist independently from one another. There is a conviction that “cohesion contributes to coherence, i.e. cohesion is one of the ways of signalling coherence in texts” (Tanskannen, 2006:18). Hence, there is a clear coexistence between the two. Barker (1992) adds that “cohesion is the surface expression of coherence relations; it is a device for making conceptual relation explicit”. They are both what makes a text semantically clear; however the concepts are different in kind, as cohesion links elements of the surface text – the actual words we see or hear, and coherence links the elements that underlie the surface text based on psychological processes.

It has already been mentioned that cohesion functions as a semantic relation grounded by grammatical forms; however, vocabulary is as important as grammar in conceiving cohesion. Consequently, Halliday and Hasan (1976:6) distinguish two types of cohesion, i.e. grammatical and lexical. The linguists emphasize that “some forms of cohesion are realized through grammar and others through vocabulary”. Nevertheless, grammatical and lexical aspects do not change the way cohesion functions; it is only realized through different devices. Halliday and Hasan determine five main cohesive devices, consider the figure below:



**Figure 1. Cohesion according to Halliday and Hasan (1976)**

The figure above displays that cohesion is distinguished into grammatical and lexical cohesion. Grammatical cohesion is connected with grammar while lexical cohesion is related to vocabulary. The first group of cohesion consists of reference, substitution, ellipsis and conjunction. The second group involves general nouns, reiteration (or so called repetition) and collocation (occurrences of certain words). This distinction suggests that cohesion can be realized through different angles as there several ways to create it within a text. However, despite its type, cohesion is a semantic link of two or more elements of a text. Whether this semantic link is created with the means of referring to some objects, omitting and substituting certain items or by linking clauses in the discourse is a matter of grammatical cohesion. As pointed out by McCarthy (1991:35) “spoken and written discourses display grammatical connexions between individual clauses and utterances”. In accordance to grammar, cohesion serves the function of identifying semantic relations.

Halliday and Hasan (1976:14) add that cohesion “is unrestricted by sentence boundaries; it is simply a presupposition of something that has gone before, either in the immediately preceding sentence or not”. Presupposition as well as cohesion can differ in kind. A

presupposition that points back to some item is identified as anaphora; whereas, the kind of presupposition that follows presupposed element is known as cataphora. However, despite differences between the cohesive devices and ways in which they are attributed, the only purpose of cohesion is to show the relation between two adjacent parts, whether they are two separate sentences, or two clauses.

Lastly, one other important matter in discussion of cohesion is a notion of structure. As already mentioned cohesion differs from coherence as the former is a structural aspect of relatedness of text sentences. However, in case of text forming and cohesion, structure is not to be understood in the usual sense. By contrast, Halliday and Hasan (1976:6) emphasize that a text is not a structural unit, and cohesion is not a structural relation. They claim that cohesion occurs when “there are certain specifically text-forming relations which cannot be accounted for in terms of constituent structure; they are properties of the text as such, and not of any structural unit <...>” (Ibid, 1976:7). In other words a text is not formed the same way a clause or a sentence are, hence cohesion within a text does not have a structural pattern. The relatedness of text sentences are semantic relations based on grammatical dependencies, but not a grammatical structure to be followed.

Concerning what has been discussed in this chapter we can state that a text is a semantic language unit, a passage of semantically related sentences conceived by coherence and cohesion. Texture is a property of being a text. Texture is cohesion within text. The function of coherence and cohesion is to make a discourse meaningful. Coherence is realized as meaning created by sentences following each other in a logical order, whereas, cohesion by elements of a sentence that interpret the preceding or succeeding elements of another sentence. Cohesion is a semantic relation of surface text, and coherence is a semantic relation that grounds the surface text. As both concepts are methods of text forming, they are indistinguishable from one another. Text is not formed the way other language units are; therefore, cohesion within text is not structural by any means it is realized as semantic relations. Cohesion is divided into smaller categories known as cohesive devices. The devices differ in kind, but perform the same function, i.e. semantically link two elements of different sentences or clauses by the use of grammatical forms.

## II.REFERENCE

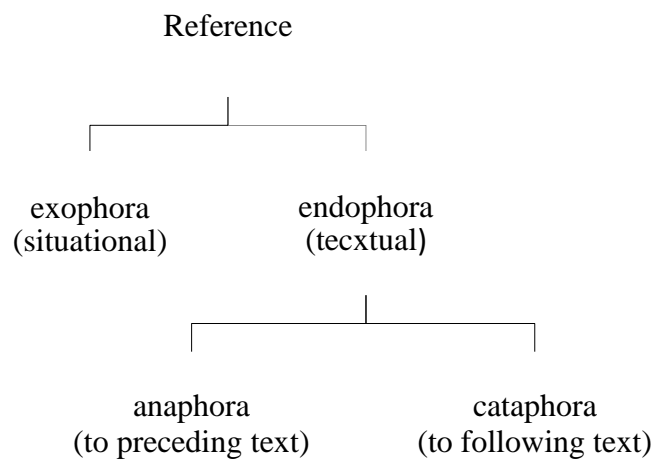
### 2.1. Concept of Reference

Reference indicates something that has already been said or will be said in the preceding or succeeding sentence or clause that way creating cohesion. Every language has certain items which have the feature of reference. In English language reference appears in three forms: personals, demonstratives, and comparatives. Reference is a link between several elements which occurs in the form of interpretation of one item to another. According to Halliday and Hasan (1976: 31-2), the main characterizing feature of reference is that information signals for retrieval. This retrieved information is the referential meaning or the identity of particular items that are being referred to. Reference is a semantic relation rather than grammatical, therefore referent does not have to be of the same grammatical class as an item it refers to. To support that idea Yule (1996:24) claims that “successful reference does not depend on some strictly literal, or grammatically ‘correct’, relationship between the properties of the referent and the referring expression chosen”. When speaking of reference term *referent* has to be defined. It means “the thing picked out by uttering the expression in a particular context” (Saeed, 2004:27). In other words, a referent is an object that is being referred to. Valeika and Verikatė (2010) use different terms and identifies the referent or the initial referring expression as *the antecedent* and the subsequent referring expression as *the anaphor*. These terms are not synonyms, but in the topic of reference they stand for the same items.

As text serves the purpose of communicating ideas the role of sender and receiver is important in defining reference. Reference occurs when several elements are linked in order to avoid re-stating every fact more times than needed, but for this relation to have purpose it has to be received. According to Yule, reference should be thought of as an act in which the sender by the use of linguistic forms enables a receiver to identify something. Or to quote Baker (1992:181), it enables the receiver “to trace participants, entities, events, etc. in a text”. Yule (1996) uses a term ‘inference’ to describe the other end of reference, i.e. the understanding of what the speaker or writer is talking about. The linguist claims that “because there is no direct relationship between entities and words, the listener’s task is to infer correctly which entity the speaker intends to identify by using a particular referring expression” (Yule, 1996:17-18). In

other words, collaboration between the sender and the receiver is a key point in successful reference.

Baker (1992:181) defines reference based on the relationship between words and reality. The linguist states that “the term reference is traditionally used in semantics for the relationship which holds between a word and what it points to in a real world”. However, such definition is too general for Halliday and Hasan as they distinguish situational reference from text reference. Situational reference is known as ‘exophora’ or ‘exophoric reference’, whereas a name for reference within text is that of ‘endophora’ or ‘endophoric reference’ (see Figure 2)



**Figure 2. Endophoric and exophoric reference (Halliday and Hassan, 1976:33)**

The difference between endophora and exophora lies in the context of situation and the context of the text. Both situational and textual reference retrieves the information necessary for the interpreting of the particular element. On one hand, exophoric reference points to something that is outside that text and usually familiar to the receiver because of the familiarity of certain situation. To quote Halliday (2004:552) “exophoric reference means that the identity presumed by the reference item is recoverable from the environment of the text”. On the other hand, endophoric reference indicates something strictly from the text, or as the linguist states, it “means that the identity presumed by the reference item is recoverable from within the text itself - <...> from the instancial system of meanings created as the text unfolds” (Ibid.). Endophoric reference can vary in kind, i.e. it can be anaphoric or cataphoric. Baker (1992:22) points out that

“after the initial introduction of some entity, speakers will use various expressions to maintain references”. The key word here is ‘after’ as anaphora defines a situation in text when the sender refers to something that has already been introduced. Cataphora is the opposite of anaphora, i.e. reference to something comes before the initial introduction. Anaphoric reference is more common than cataphoric, because the latter might cause misunderstanding in many situations. Consequently, Beaugrande and Dressler (1981:63) suggest that “the cataphora raises a momentary problem in the surface text and helps to propel the readers into the story”. Cataphoric reference causes a temporary problem of item identification that is usually made on purpose.

Another important aspect of reference as pointed out in Halliday and Hassan (1976:36-37) is that “a reference item is not of itself exophoric or endophoric; it is just ‘phoric’ – it simply has the property of reference”. In other words, despite whether the context is textual or situational reference is simply a notion that the information must be retrieved from elsewhere. However, the linguists emphasize the role of cohesion within these two reference types. Because exophoric reference does not link two elements within the text, it is not as much a cohesive device. It links the language with the context of the situation, but not the context of the text, i.e. it “directs the receiver ‘out of’ the text and into an assumed shared world” (McCarthy, 1991:41); it takes the listener/reader out of the text for the interpretation. Therefore, it could be stated that reference has more functions than only being a cohesive device. But where cohesion is concerned endophoric reference is the norm, as it is the one contributing to the integration of two or more different passages that form the same text (Halliday and Hassan, 1976: 37).

## **2.2. Types of Reference**

We have already discussed the division of exophoric and endophoric reference, but this kind of distinction only shows where can the referent be identified, in the text or outside the text. Yule (1996:17) presents such reference types: proper nouns (e.g. ‘Shakespeare’, ‘Cathy Revuelto’, ‘Hawaii’), noun phrases which are definite (e.g. ‘the author’, ‘the singer’, ‘the island’), or indefinite (e.g. ‘a man’, ‘a woman’, ‘a beautiful place’), and pronouns (e.g. ‘he’, ‘her’, ‘it’, ‘them’). Lyons (1996: 296) establishes a distinction between two main subclasses of referring expressions: noun-headed noun-phrases (e.g. ‘the boy’, ‘those four old houses’) and pronouns. Noun-headed noun-phrases can be classified in several ways. One of the subclass is that of definite description, which refers to some definite entity. Baker (1992:181) claims that

pronouns are the most common referring expressions in English and other languages as well. However, Halliday and Hasan present a more detailed distinction of reference types, i.e. personals, demonstratives, and comparatives.

Personal reference is the one that indicates the items that are being referred to by the usage of person oriented pronouns or adjectives. Demonstrative reference is reference by means of location. Usually it is a form of verbal pointing, because “the speaker identifies the referent by locating it on a scale of proximity” (Halliday and Hasan, 1976:57). However, it must be noted that some instances of demonstrative reference are known as deixis. In the *Routledge Dictionary of Language and Linguistics* (1996:286) deixis is explained as a “characteristic function of linguistic expressions that relate to the personal, spatial, and temporal aspect of utterances depending upon the given utterance situation (deictic expression)”. Valeika and Verikaitė (2010) note that reference takes place in two types of situations: 1) non-linguistic; 2) linguistic. Reference occurring in a form of deixis appears in the former, as this kind of situation is visually shared, thus directly pointing to particular person, space, or time. Comparative reference indirectly indicates something by means of identity or similarity. In comparative reference the referent points to something that is same or different, like or unlike, equal or unequal, more or less rather than referring to the same entity over again. Halliday (2004:560) notes that “whereas personals and demonstratives, when used anaphorically, set up a relation of co-reference, whereby the same entity is referred to over again, comparatives set up a relation of contrast.” Personals occur in the form of different pronouns like *I, you, he, she, it, we, they*, and their inflections whereas, demonstratives as deictic adverbs *here, there, now, then* and comparatives are usually adjectives and adverbs *same, identical, different, equal, such, likewise, better, more, other, else*, etc.

Considering what has been discussed so far it can be generalized that reference is a device used for pointing to particular objects. The main distinction of reference depends on the placement of the object it refers to, whether it is within or out of the text situation. There are three dominant types of reference that identify persons, demonstrate and compare objects. Referring expressions are usually pronouns, adverbs and adjectives.

### **III. REALIZATION OF REFERENCE IN SCIENCE RESEARCH ARTICLES**

Before starting the practical part of this research it is important to define what is characteristic of science research articles or more specifically the scientific language in general. Day (1998:11) states that “a scientific paper is a written and published report describing original research results <...> a scientific paper must be written in a certain way and published in a certain way”. In other words, scientific language contains very strict rules of its correct usage. Precision and clarity are the key words in describing scientific language. The main rules of the writing style of scientific texts are keeping it short, selecting simpler words, avoiding subjectivity. The empirical part of the research will disclose how reference as a cohesive device is correlated with these rules.

#### **3.1. Methodological Considerations**

The empirical research is based on reference examples collected from science research articles from the study field of psychology. 10 articles were taken from the journal *Body Image* (Volume 10, Issue 1) published January, 2013 which is available at *Science Direct* website. *Science Direct* is a leading full-text scientific database operated by the Dutch publishing company *Elsevier*. The data base offers journal articles and book chapters from more than 2,500 peer-reviewed journals and more than 11,000 books.

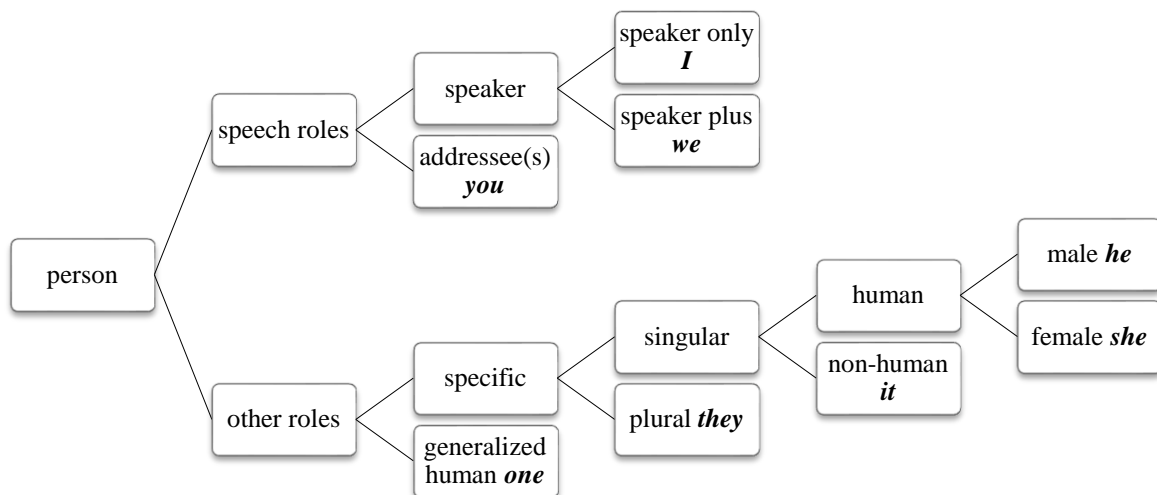
The descriptive–theoretical literary analysis method was used to overview the scientific literature related to the phenomenon of cohesion and particularly its device reference. The descriptive analytical method was applied to sort out and investigate the examples of reference, i.e. personals, demonstratives, and comparatives. The science research articles under investigation were formatted as PDF files and the examples of reference were identified and counted using the advanced search function, which provided the total number count of the examples and presented the sentences in which the reference items occurred. Descriptive–statistical method was applied to depict the frequency of reference in the works under investigation. For the purpose of language economy the sources of the analysed articles were transferred to Annex I.

Overall 6081 examples of reference items were found of which 848 identified as personals, 4690 as demonstratives, and 543 as comparatives. Personals were classified into first, second and third person pronouns; demonstratives into demonstrative pronouns, demonstrative adverbs and the definite article; comparatives were classified into general and particular. The data showing the frequency of personals, demonstratives and comparatives and their individual categories is displayed graphically in tables and pie graphs. A number of 50 examples of varying referring expressions were selected, presented and analysed in detail in this research paper.

The corpus of the practical part of the research paper has been divided into three categories: personal reference, demonstrative reference and comparative reference, each group containing subchapters for more detailed analysis.

### **3.2. Personal Reference**

Traditionally, categories of person or speech role are first person, second person and third person, all of which intersects with the number categories, i.e. singular and plural. The difference between these roles is that first and second persons are more likely to be exophoric, as they refer to the sender and receiver rather than the text itself, whereas third person forms are more often endophoric as they typically refer to the preceding or following items in the text (Halliday and Hasan, 1976:48). Simply put first person pronouns refer to the speaker himself/herself or a group to which the speaker belongs; second person pronouns refer to the speaker's audience or addressee; third person pronouns refer to the person or people other than the speaker and the addressee. Lyons (1995:302) and Yule (1996:10) agree that first and second person pronouns are purely deictic, because they point directly to the persons by their speech roles. A detailed distinction of person roles and their forms is given presented in Figure 3.



**Figure 3. A system of person (Halliday and Hasan, 1976:44)**

A system of person displays all pronoun forms in the nominal case. Speech roles including such pronouns as *I*, *you*, *we* are more likely to be exophoric as they point either to the sender or addressee. Other roles like *he*, *she*, *it*, *they*, *one* are endophoric, because they refer to the referent within the text. The distinction between the latter occurs in the specific or general, singular or plural, human and non-human forms. The pronouns portrayed and the figure plus their possessive forms belong to the personal reference. Halliday and Hassan (1976:43) identify three classes of personals: personal pronouns, possessive determiners (or ‘possessive adjectives’), and possessive pronouns.

### **3.2.1. The Use of First and the Second Person Pronouns**

There were no examples of first person singular pronouns found in the analysed texts. Plural forms of nominative first person pronouns and possessive first person pronouns were mainly used to refer to the author(s) of the articles or simply the sender in order to avoid constant repetition of passive voice. Therefore, the most common first person form was *we*. This is an example of exophoric reference, because they refer to the sender and not some item within the text. Examples are as follow:

(1) *Thus, we are unable to identify cause–effect relationships across these key areas.*

*(Annex I, research article 6)*

(2) *We also sought to begin the investigation of the underlying processes by which warning labels might operate. (Annex I, research article 5)*

Both examples are in plural form, because the articles under investigation were written by more than one author. *We* is used for the purpose of introducing the reader with the steps the researchers took during the study and the results of the study. Nevertheless, in cases when the author of the discourse is one person, the usage of singular first person pronoun *I* may occur in the scientific texts, but it is less formal and more subjective than the usage of *we*. For this reason the pronoun *we* may actually refer to one person, i.e. the sender; however such examples were not found. This kind of personal reference indicates the direct reference to the sender.

As the sender is the one being referred to the reference is often expressed in the possessive form of first person plural pronoun as well, that in English language is *our*:

(3) *This finding suggests that female participants within our sample exerted a default positivity-bias by viewing their bodies as closer to their ideal body weight than it objectively was. (Annex I, research article 3)*

(4) *Our aim of this instruction was two-fold: (1) we wanted to measure WBSE under the condition of schema activation and (2) we wanted to provide a standard negative body-image experience across participants. (Annex I, research article 10)*

These examples again display the exophoric reference to the author(s) of the discourse, i.e. the sender(s). Because of their exophoric features these examples are not cohesive, as they point to items or more likely persons that are out of the text, and not to the corresponding referent in the preceding or following sentence or clause in the text. Consequently, it must be noted that the usage of *we* and *our* does not provide cohesion, because it does not tie the elements of the text, but rather emphasize the role of the sender. On the other hand pronouns *we* and *our* may refer not only to the sender, but at the same time the receiver as well:

(5) *The study assumed that we can be conscious of and explain our preferences for visual images, despite evidence that social comparisons often occur spontaneously and subliminally (Mussweiler, Ruter, & Epstude, 2004). (Annex I, research article 8)*

This example shows how first person pronouns may indicate more than specific persons, i.e. the senders. In such case *we* and *our* is a reference to all people, that can be the writer/sender,

the readers/addressee or neither. This kind of reference has no connection with the text, nor the speech roles displayed in Figure 3, it refers to all human beings in general, and therefore is not a cohesive device.

There have been no occurrences of the second person pronouns found in the chosen scientific articles. The second person pronouns are usually used for the sender to address the receiver; however, in the genre of science research articles such addressing is not typical, therefore second person pronouns were non-existent.

### 3.2.2. The Use of Third Person Pronouns

We have already discussed that first and second person pronouns are usually exophoric, but third person pronouns are endophoric, because the referent that the third person pronoun stands for is somewhere in the preceding or succeeding segment of a text. The majority of collected examples are of anaphoric reference. The most common third person pronoun that was found is plural possessive form *their* and its nominal form *they* as it can be both human and non-human oriented. The second most common pronoun was *it* with its possessive form *its* and *itself*, then followed the pronouns *themselves* and *them*. Third person human singular pronouns *he*, *she* and their possessive forms as well as generalized human forms *one* and *one's* were quite infrequent compared to those referring to non-human items.

We will start our analysis of the frequency of third person pronouns occurrences within investigated science research articles with the plural form *they* and divide it into reference to human and non-human objects. Examples of reference to humans are given below:

- (6) *Respondents rate the extent to which they agree with a series of statements about the self on 4-point scales ranging from “strongly agree” to “strongly disagree.” (Annex I, research article 10)*
- (7) *These results suggest that individuals with body image disturbance show a tendency to experience an upward comparison process, and in reality, they may look at attractive people more than they observe unattractive people. (Annex I, research article 9)*

In the example (6) we can see that the third person pronoun *they* refers to the *respondents*. Since the referent *respondents* is mentioned first, this is a typical example of anaphoric reference. In example (7) the referent *individuals with body image disturbance* goes

first and is immediately followed by the referring expression *they* which is then followed by a second *they* that points back to the initial noun phrase and not the first pronoun. Such occurrences are called chains of reference, because the referring expression is used more than once. Although third person plural form *they* is very frequent, its possessive form *their* is even more common. The examples are also those of human oriented pronoun usage:

(8) *These alarming findings suggest that children are sensitive to societal norms for weight and appearance very early, which may negatively influence their body esteem even before they reach their adolescent years (Herbozo & Thompson, 2006; Mendelson et al., 1996). (Annex I, research article 7)*

Here the noun *children* is substituted by *they* and its possessive expression by *their*. Three occurrences of personals within one sentence is a great example of cohesion. But as *children* is not the only noun phrase within sentence the usage of personals depends not only on cohesive aspects, but also on coherence.

Examples of third person plural pronoun *they* and its possessive form *their* to non-human items are less usual than those to human items, but are existent within investigated texts as well:

(9) *Research and clinical settings (e.g., laboratory, hospital, etc.) are artificial environments in the sense that they cannot reflect all aspects of individuals' lives. (Annex I, research article 4)*

(10) *However, few studies have explored the influence of visual images, and specifically photographs, in weight-related health materials despite their widespread use in publications and online. (Annex I, research article 8)*

Both examples are anaphoric reference, because the linguistic referent in example (9) *research and clinical settings* and in example (10) the referent *photographs* are new information introduced in the text or sentence and the referring items in (9) *they* and in (10) *their* serve to re-use this information avoiding constant repetition of these items.

Of other third person plural personals the pronouns *them* and *themselves* occurred quite frequently:

(11) *That is, the high BD men and women perceived the idealized bodies as the more positive body type than how the low BD individuals perceived them. (Annex I, research article 9)*

- (12) *These items ask participants how important weight and shape are in influencing how they feel about themselves as people. (Annex I, research article 10)*

Both examples present anaphoric reference as well, because the referents *the idealized bodies* (11) and *participants* (12) are being referred to after their initial introduction by the pronouns *them* and *themselves*.

The second most common third person pronoun found in the analysed discourse was specific singular non-human *it* with its possessive form *its*.

- (13) *The sample was ethnically and socioeconomically diverse, and was representative of the population from which it was drawn (U.S. Census Bureau, 2000). (Annex I, research article 1)*

- (14) *This was followed by a recall task which asked participants to write down both the product and its associated brand name featured in each of the ads they had seen, again to support the cover story. (Annex I, research article 5)*

These examples present the typical anaphoric reference within sentences when the referent is a simple noun, in example (13) introduced as *the sample* and the referring expression is pronoun *it*. In the case of example (14) the referent or initial noun phrase is *the product* but the referring expression holds another form, i.e. the possessive form *its*. That makes the sentences cohesive, however, they would still be coherent and logical if the noun phrases would have been repeated a second time instead of substituted with personals. On the other hand, the pronoun *it* is very important in creating cohesion, because it can refer not only to a particular single object, but also to a bigger part of the text as in the example below:

- (15) *In both experiments, the more state appearance comparison participants reported engaging in, the greater the increase in body dissatisfaction in response to thin ideal images, irrespective of warning label condition. This is consistent with some previous research (Bessenoff, 2006; Tiggemann & McGill, 2004; Tiggemann et al., 2009; Tiggemann & Slater, 2004), as well as theoretical explanations of the negative effects of media images (e.g., the sociocultural model). Importantly, it is also consistent with the assumed underlying rationale for the use of warning labels. (Annex I, research article 5)*

Here we can see that sometimes the whole sentence can be the referent, and repeating it a second time instead of using referring expressions would distort the text. The first referring

expression indicating the referent is a demonstrative pronoun *this* which is used to emphasize that the referent is more than just a noun phrase. Second occurrence of reference is the personal *it* which clearly points to the initial segment of the text, i.e. the referent. In such case, if *it* would have been substituted with *this* the second pronoun would refer to the first pronoun, and not to the referent. Hence, the correct usage of different types of reference is crucial in creating cohesion and avoiding misunderstandings in the surface text.

The usage of singular human pronouns was quite infrequent in the analysed science research articles, but those that were found were also anaphoric. Consider the example below:

- (16) *In the first session, the participant received information about the study procedure and signed an informed consent form, which explicitly stated that she was free to discontinue the experiment at any time. (Annex I, research article 3)*

Since the pronoun *she* refers to the noun *the participant*, and as *the participant* is neutral of gender word, such reference not only ties two elements of the sentence, but also identifies the referent as a feminine object by using a pronoun *she*. Therefore, it must be noted that third person singular human pronouns have a double function: they provide cohesion; they also provide new information in the text, i.e. the gender of the introduced person.

- (17) *Height and weight were measured for each child in order to calculate his/her Body Mass Index-for-age (BMI-for-age) percentile using the “Epi Info software program” (CDC, 2008). (Annex I, research article 7)*

The text above depicts the general use of pronouns *his/her*. As the referent *each child* does not disclose the information of gender these pronouns separated with slash refer to the referent in general. Such referring expression can be substituted by *one* to present the same information. The next example affixes that.

The last analysed example of personals in this research belongs to a generic reference. It must be pointed out, that any personal pronoun can function as a generic reference, except for the first person singular *I*, but the only truly generic pronoun is *one* and its possessive form *one's*, because this pronoun refers to any individual despites his or her gender:

- (18) *One cognitive-affective component of body image is body dissatisfaction, which has been defined as displeasure with some aspect of one's appearance and can occur when inconsistencies exist between perceptions of one's actual physical attributes and those one would like to, or think one should possess. (Annex I, research article 4)*

In this kind of sentence *one* represents any person, and therefore such pronoun is possible to be substituted by another pronoun, e.g. *we* and its possessive form *our*. In such case the reference would still be generic, because it refers to people in general. The reference here is not textual, because it does not have a referent in the text and that is why it is not cohesive. However, in order to identify reference as a cohesive device, such examples must be displayed and discussed in order to draw a line between cohesive and non-cohesive reference and learn about the fundamental differences.

### 3.2.3. Cataphoric Personal Reference

So far only the anaphoric reference was discussed, because this type of reference is the most common not only within the analysed texts, but most texts of other genres as well. This part will shortly present the cataphoric reference and its examples in practice. It was already mentioned in the theoretical part of the research that covered the concept of reference that the distinction between anaphora and cataphora lies in the placement of the referent. Cataphoric reference makes the reader to search for the necessary information in the following segment of a text:

- (19) *Despite its contributions, the present study has certain limitations which need to be addressed. (Annex I, research article 9)*

Third person non-human possessive pronoun *its* in itself has no meaning, because it is unclear what exactly is meant by this pronoun, however as the referent *the present study* comes shortly after the link between these two items becomes apparent.

The following example of cataphoric reference is third person nominative plural form:

- (20) *No matter how sensible they sound, the National Advisory Group on Body Image (2009) proposal and other similar proposals cannot simply be assumed to be effective. (Annex I, research article 5)*

The referring expression *they* point to two objects: *the National Advisory Group on Body Image (2009) proposal*; and to *other similar proposals*, and because all objects are used in a close proximity there is no misunderstanding what the pronoun *they* stands for. In addition, in the genre of science research articles the authors aim to make the text as clear and understandable as possible. Therefore, cataphoric reference found in the analyzed discourse always occurred within the same sentence, i.e. intra-sententially.

The next example shows that the reference chain can be cataphoric as well:

(21) *Thus, despite their assumed effectiveness by their many advocates, warning labels (generic or specific) had no main effect on body dissatisfaction in the present experiments. (Annex I, research article 5)*

Whereas in examples (19) and (20) the items of cataphoric reference could be reversed and made anaphoric, it is not possible to do so in example (21), because it would distort the sentence and make it too complex to understand. The reason for this is because here we have chain reference, as the possessive pronoun *their* is repeated twice and points to the initial noun phrase *warning labels*. The reference of this sentence, however, may become anaphoric, but for that the sentence structure must change.

In conclusion, the frequency of cataphoric reference was very low in the investigated texts. Such reference is typically found in other genres, especially fiction, because it requires the reader to look for explanations of the referring expression further, but in the scientific language it may cause uncertainty and therefore its usage is very minimal.

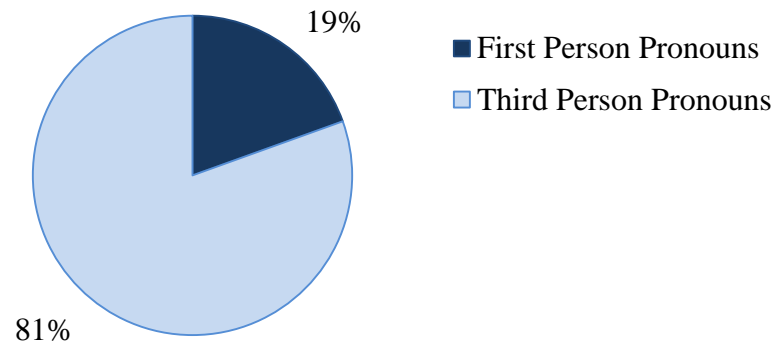
The corpus analysis was carried out to determine the relative frequency of the occurrences of first and third person pronouns, as there were no examples of second person pronouns found. Consider the following table:

Pronouns	Number of examples	Percentage
they, their, them, themselves	<b>525</b>	<b>61,9 %</b>
we, our	<b>165</b>	<b>19,5 %</b>
it, its	<b>68</b>	<b>8 %</b>
she, her	<b>58</b>	<b>6,8 %</b>
one, one's	<b>32</b>	<b>3,8%</b>
Total:	<b>848</b>	

**Table 1. The distribution of personals**

Table 1 illustrates that the most common personal pronoun found within analysed texts is the plural *they* with its inflectional forms and it takes up more than half of all the collected examples. Therefore, third person pronouns dominated in the investigated texts. However, first person pronouns *we* and *our* were the second most frequent pronoun identified. Third person

singular pronouns were considerably sparse. The general frequency of first and third person pronouns is displayed in Figure 4:



**Figure 4. The relative frequency of the first and third person pronouns**

The above figure shows that the analysed science research articles mostly contains third person pronouns with 81% (683 tokens), whereas the first person pronouns amount for less than one-fourth of that number and occur with 19% (165 tokens). From such numbers the conclusion can be drawn, that the analysed articles and science research articles in general avoid reference expressing speech roles, i.e. the sender and the receiver, especially the latter as it was non-existent. The reason for this is that the genre of science research articles has very strict rules of writing, and acknowledging the speech roles may bring too much subjectivity in such texts.

### **3.3. Demonstrative Reference**

Demonstrative reference is understood as a form of verbal pointing, because the referent is identified by its proximity. Halliday and Hassan (1976:58) have in mind the proximity regarding the point of view of the speaker. Pronouns *this* and *these*, adverbs *here* and *now* means near to the speaker, whereas pronouns *that* and *those*, adverbs *there* and *then* remote from the speaker. These referring expressions are used to indicate the location of space or time. Yule (1996:13) claims that expressions pointing to location *here* and *there* belong to spatial deixis. Additionally, there are two types of location: physical, and psychological. In other words, the location can be close or remote to the speaker not only in physical way, i.e. how one sees or hears things as being near or distant, but also mental depending on the context.

Lyons (1995:305) remarks that demonstrative adverbs *there* and *then* are negatively defined in relation to *here* and *now* because *there* means *not here* and *then* means *not now*. The linguist also acknowledges the role of the speaker and notes that the true meaning of adverb *here* depends on the location of the speaker, and that it changes with the speaker. *Here* may not mean the same place for two or more separate individuals.

Halliday and Hasan (1976:59-74) distinguish three types of demonstrative reference: 1) the demonstrative pronouns *this* and *these*, *that* and *those*; 2) the definite article *the*; 3) the demonstratives adverbs *here*, *there*, *now* and *then*. Demonstratives *this* and *these*, *that* and *those* occur with a noun phrase and are anaphoric. Demonstratives *here*, *there*, *now* and *then* refer directly to the location of the process in space or time.

### 3.3.1. The Use of Demonstrative Pronouns

The frequency of the demonstrative pronouns *this* and *these* was higher than the frequency of *that* and *those* in the analysed texts. The linguistic element *this* functions as an indication to the nearest object. The determiner *this* can be a modifier - it is used before a noun phrase to indicate which object is meant that way creating cohesive ties with the noun phrase that the pronoun points to:

- (22) *First, self-report data are typically collected via retrospective assessments, requiring participants to summarize their experiences over some time period. This recall and summarization process is prone to systematic biases due to cognitive heuristics used in memory search and reconstruction (Smyth & Stone, 2003; Stone & Shiffman, 1994)., (Annex I, research article 4)*

In this example the noun phrase *this recall and summarization process* consists of the nouns and the modifying element *this*, which draws the reader's attention to the preceding sentence. The noun phrase *recall and summarization process* does not carry any new information, because the first sentence has already defined what kind of process takes place, but instead of repeating the exact phrase twice, the authors chose to change the part of speech from verb to noun. Thus, the phrase *this and summarization process* actually points back to the first sentence of the example creating a cohesive tie between the sentences.

Demonstrative pronoun *this* also serves as a head of the noun phrase. Verikaitė (1999:43) points out that even though the meaning of head and modifier *this* is the same, they are used in different patterns. Consider the example below:

- (23) *After viewing the 15 advertisements, participants completed the post-exposure VAS measures (mood and body dissatisfaction), then measures of state appearance comparison, perceived self-relevance, and lastly, trait appearance comparison. This was followed by a recall task which asked participants to write down both the product and its associated brand name featured in each of the ads they had seen, again to support the cover story. (Annex I, research article 5)*

The demonstrative *this* as a head refers to the whole first sentence. Such occurrences are quite common, because they are very effective means of cohesion and language economy. The usage of *this* in such sentences allows presenting the information introduced in the preceding sentence in the most compact way.

The usage of demonstrative plural pronoun *these* is also frequent and can function as a modifier of the noun phrase:

- (24) *Many different public health promotion strategies have been developed to counter these trends. Supporting these strategies is an increasing evidence base specifying the effective mechanisms for behavior change (such as self-monitoring alongside behavioral goal setting and feedback) and the need for these to be implemented in health promotion interventions (Michie, Abraham, Whittington, McAteer, & Gupta, 2009). (Annex I, research article 8)*

The referring expression *these strategies* anaphorically points to the referent *public health promotion strategies* and that way creates textual cohesion. Just as its singular form, the pronoun *these* can also function as a head of a noun phrase, but such occurrences were not found within the investigated texts.

The demonstrative pronoun *that* can be used as a modifying element of the noun and it can be single without a head noun. However, the analysed texts lack the examples of the usage of this kind of demonstrative reference. The examples that were found disclose the usage of *that* as a single element:

- (25) *One prior examination of changes in adolescents' body dissatisfaction was conducted over a 5-year period, utilizing the same data set as that being used in the*

*current study, and was comprised of two cohorts of students in middle school and high school, respectively, at baseline. (Annex I, research article 1)*

Here the pronoun *that* points to the referent *the same data set* and exemplifies anaphoric demonstrative reference by verbally pointing to the object. However, as the noun phrase *the same data set* contains comparing features because of the adjective *same* this example is also that of comparative reference which will be discussed in another chapter.

- (26) *Encouraging preliminary results come from the only known published study (Slater, Tiggemann, Firth, & Hawkins, 2012) which has investigated such a strategy. In that study, participants who viewed a series of fashion spreads with a warning label indicating that the image had been digitally altered reported lower body dissatisfaction than participants who viewed the same fashion spreads without the warning label. (Annex I, research article 5)*

Demonstrative *that* in this segment refers to the phrase *the only known published study*. This is not only a verbal pointing to the chosen object, but also an economy device, because repeating the referent for a second time is not acceptable and would lengthen the text and defy the stylistic rules.

Plural form of the pronoun *this* presents the same referring pattern, i.e. verbal pointing to objects that are not being introduced directly:

- (27) *Participants who dropped out did not differ from those completing the study on any demographic or psychological variables. (Annex I, research article 7)*
- (28) *Labels were clearly visible and designed to be similar in size to those used by Girlfriend magazine. (Annex I, research article 5)*

The noun *participants* in example (27) is introduced first and then followed by the referring expression *those* which is typical example of anaphoric reference. However it should be noted that the pronoun *those* serves not only as a verbal pointing to the initial noun phrase, but it also introduces new information, i.e. that there are some other kind of *participants*. This function would be more obvious if the example occurred not intra-sententially. The same is applied for the example (28) where the demonstrative *those* refer not directly to the referent the *labels*, but some other kind of *labels* that are not mentioned in the text. Therefore, the usage of the pronoun *that* and *those* in the investigated examples can be interpreted from different angles.

It may be concluded that the usage of demonstrative pronouns *this* and *these* is considerably more frequent than the usage of *that* and *those* in the analysed scientific texts. The main difference between these demonstrative pronouns is the distance, i.e. verbal pointing to close and remote items. Also whereas pronouns pointing to closer objects were functioning as the modifier and the head of a noun phrase in the analysed discourse, pronouns pointing to remote objects did not serve as a modifier of a noun phrase.

### 3.3.2. The Use of Demonstrative Adverbs

There are four demonstrative adverbs: *here*, *there*, *now* and *then* also known as deixis. The main function of these adverbs is to verbally point to a particular place or time, therefore time deixis and place deixis can be distinguished. The adverbs *here* and *there* are used to indicate the place, and the usage of each depends on whether the object is close or remote. The time deictic items *then* and *now* do not have the same distinction of closeness, because *now* cannot mean any other time except for that the speaker uses at the exact moment, which in itself may mean a period of time in the present, or the present in general. *Then* can be used to describe any time that is not this particular time the speaker is referring to. The place deictic items in the investigated discourse indicated that the referent was found somewhere in the texts.

The usage of demonstrative adverbs is not very frequent within analysed science research articles. We will start the analysis of demonstrative adverbs from place deixis *here*:

- (29) *The present studies sought to further experimentally investigate the effect of warning labels on women's response to thin idealized media images. Here, fashion magazine advertisements were chosen as the focus, as these both epitomise the thin ideal and constitute much of the content of fashion magazines. (Annex I, research article 5)*

The example portrays the anaphoric reference, because the referent is introduced first as *the present studies* and followed by the referring expression *here*. The referent is used in nominative case and directly it does not mean any particular place, however it is clear from the context that the referring expression points to the referent, *here* means in *the present studies*. This kind of closeness is psychological, as *the present studies* is not a physical object, however the adverb still performs a referential function and creates a cohesive tie between two separate sentences.

Whereas the adverbs expressing close to the speaker objects were still found, the usage of reference to distant objects was almost non-existent:

(30) *In neither experiment was there a significant effect of type of label. (Annex I, research article 5)*

(31) *In Experiment 2, with slightly different measures, there was no difference in perceived realism, self-relevance, or state appearance comparison across warning label conditions. (Annex I, research article 5)*

The examples (30) and (31) are the only ones of the adverb *there* found in the discourse that can be interpreted as a demonstrative reference. The sentences are slightly misleading, it is not entirely clear whether the adverb *there* is used to refer to the referents or is it just a common usage in English language of word phrase “there is/ there are”. The reference can be seen, because *In neither experiment* in example (30) functions as a referent and *there* is a direct reference to that initial phrase. The same applies to example (31) adverb *there* points to the referent *In experiment 2*. However, as both sentences would still be coherent and cohesive without the usage of *there* the adverb seems to be cohesively irrelevant.

Adverbs identifying time were slightly more frequent, but do not make a great number of examples. Consider the sentences below:

(32) *Not only are the models naturally thin, but digital modification techniques are now routinely used to further elongate legs and slice off kilograms and centimetres from waists, hips, and thighs, as well as to eliminate any other blemishes (Bennett, 2008). (Annex I, research article 5)*

Here the deictic *now* refers to the present in general, and not the particular moment the speaker uses it. The referring expression in this example simply means “nowadays”. Hence, the reference in this instance is exophoric, because it does not have any relation to other text items.

(33) *Having demonstrated in Experiment 1 that the thin-ideal image conditions led to greater body dissatisfaction than the product image condition, Experiment 2 used only the conditions containing the thin and attractive models. Thus there were now three conditions (no label, generic label, specific label) using exactly the same thin-ideal advertisements as stimuli as before. (Annex I, research articles)*

The referring expression *now* refers to the present time of a situation. It differs from the sentences in example (32), because *now* does not have a generalized meaning in example (33).

Here deictic *now* indicates a specific moment in the process of text production, as *now* is referring to something other than what happened before in the text. Thus the adverb *now* can be interpreted as a result or conclusion to earlier events presented in the analysed discourse.

Opposition to adverbial demonstrative *now* is deictic *then*. Verikaitė (1999) states that the adverb *then* could be defined as expressing either a particular time in the past or future; or next in time, space or order, immediately afterward. 37 examples of deictic *then* were found in the analysed texts and all of them refer to the latter, i.e. meaning “after” some event:

(34) *The first session consisted of a discussion of the definition of self-objectification and the thin-ideal proposed by society, how the thin-ideal is maintained, and who benefits from the thin-ideal (i.e., media, advertising agencies). Participants then completed a writing assignment outlining negative costs associated with self-objectification and the thin-ideal, sources of pressures placed on women to attain the thin-ideal, and the impact this has on women. (Annex I, research article 2)*

(35) *During the initial meeting (conducted in groups of 4–12 women), study procedures were described and all women provided informed consent to participate. All participants then completed the demographic information and the questionnaires described above. (Annex I, research article 7)*

Demonstrative adverb *then*, when used in such sentences, functions conjunctively, because it defines two or more events in time that follow each other. An order of events expressed with *then* is still cohesive, because there is a link between two elements. It is clear in example (34) that there are two events: *discussion* and *writing assignment* and *then* refers to the second. The same applies for example (35) where the first event is *all women provided informed consent*; the second event is *all participants then completed*. The adverb *then* not only expresses an order of these two events, but it also creates cohesive ties, because it determines that *all women* are *participants*. Consequently, the adverb *then* does not function referentially in such sentences, but it still provides cohesion and makes the text coherent.

Summing up, the use of demonstrative adverbs in the chosen science research articles is very limited and in some cases these adverbs do not have the referential function, but are still cohesive. Such examples were provided to emphasize the different ways the adverbs can be used to maintain cohesion and because some occurrences of referential adverbs were non-existent. The collected examples show that time deixis is more frequent, than place deixis. From small

number of examples we can assume that adverbial verbal pointing is not characteristic of scientific language.

### 3.3.3. The Use of the Definite Article

Another important mean of demonstrative reference is the definite article *the*. The analysis showed that the definite article is the most common example of reference in the analysed texts and it includes 4000 examples of such occurrences. The definite article signals the definiteness of the noun it modifies, it shows that the given information is not new, that it has been already said or mentioned. To identify new information indefinite articles *a* and *an* are used. *The* is a referential item, as it can be both anaphoric and cataphoric. The definite article refers anaphorically if the referent is identifiable in the preceding text:

(36) *College women were invited to take part in a study about body image and everyday experiences of young women. <...> Participants began the study on different days of the week to ensure that day of week and day of EMA were not confounded. (Annex I, research article 7)*

(37) *In that study, participants who viewed a series of fashion spreads with a warning label indicating that the image had been digitally altered reported lower body dissatisfaction than participants who viewed the same fashion spreads without the warning label. (Annex I, research article 5)*

These examples display how exactly the definite article *the* creates cohesion within sentences. The referent in example (36) is *a study* and this word phrase introduces new information, whereas the referring expression *the study* in the following sentence repeats that information and points directly to the referent. The article in this case is the fundamental item in creating certain meaning, because if the second article would be indefinite, the word phrase would suggest that there is more than one study. Example (37) is the same, as *the warning label* refers to that particular *warning label* which is noted with an article *a* presented in the first sentence. The definite article creates a link between the sentence in which it is used and the one in which the referent appears. However, what is noteworthy, is that in anaphoric reference *the* could be replaced by the demonstrative pronoun *this* and it would still maintain the same function and would have the same referential meaning. In such cases it is the speaker's choice which referring expression he or she uses.

The definite article may also provide cohesion by establishing the link with a verb phrase as well as with a noun phrase:

- (38) *Second, physical activity was assessed using the modified SAPAC during which children recalled activities on the previous day and the recall was limited to weekdays. (Annex I, research article 7)*

In the above text the link is created between the verb *recalled* and the noun phrase *the recall*. This is also an example of anaphoric reference, because the verb *recalled* is a referent, which is then followed by the referring expression *the recall*. This example once again proves that cohesion exist in many forms and that the context relevant for its identification.

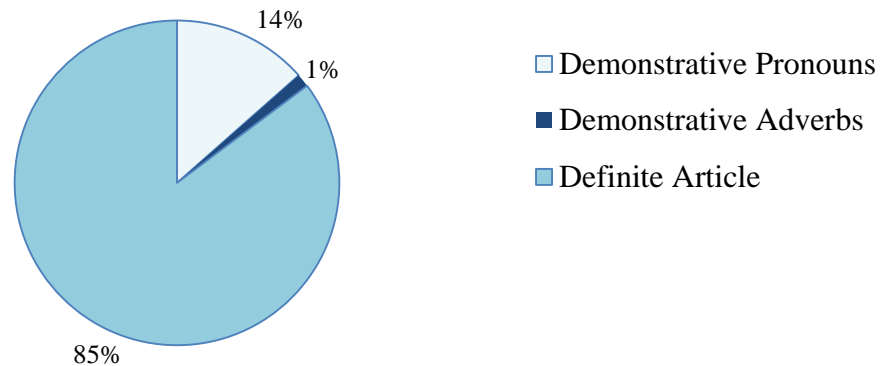
Unlike other types of demonstrative reference the definite article is more likely to be cataphoric. The use of the definite article can signal the identity, for example:

- (39) *Sociocultural influences are theorized to contribute to women's attitudes toward their bodies through three general processes: message exposure, the decision to internalize societal standards, and a response to such internalization (e.g., Dunkley et al., 2001; Fredrickson & Roberts, 1997; Ricciardelli et al., 2003). (Annex I, research article 6)*
- (40) *Relatively little research has investigated the impact of exposure to muscular male media images, and the results have been mixed (Diedrichs & Lee, 2010). (Annex I, research article 9)*

The sentences above present cataphoric reference as the definite article comes before the noun phrase. It emphasizes *which decision* example (39) and *which impact* example (40) are meant and that they are recoverable from the noun phrase in which *the* is used. However, these examples of the definite article serve as an economy device, because it does not require mention of a referent, rather than cohesive.

In conclusion, from the observations above it is clear that the definite article is an important device in creating text coherence and cohesion. Cataphoric definite article is more common, because it usually refers to a modifying element within the same noun phrase. Anaphoric definite article is more often substituted by another demonstrative, i.e. the pronoun *this*. That is the reason why cataphoric definite article dominated in the discourse. More often the authors chose the demonstrative pronoun, rather than the definite article for anaphoric reference.

The corpus analysis provides the frequency of all collected demonstratives within the investigated texts. Demonstrative pronouns included: *this, that, these, those*; demonstrative adverbs included: *here, there, now, then*. The results show that the dominating demonstrative was the definite article *the*. The general frequency of demonstratives is illustrated in Figure 5:



**Figure 5. The relative frequency of demonstratives**

As can be seen from the chart the definite article is the most frequent demonstrative found within analysed texts and makes account for 85% (4000 tokens). Other demonstratives made considerably lower accounts: demonstrative pronouns 14% (632 tokens), and demonstrative adverbs only 1% (58 tokens).

### 3.4. Comparative Reference

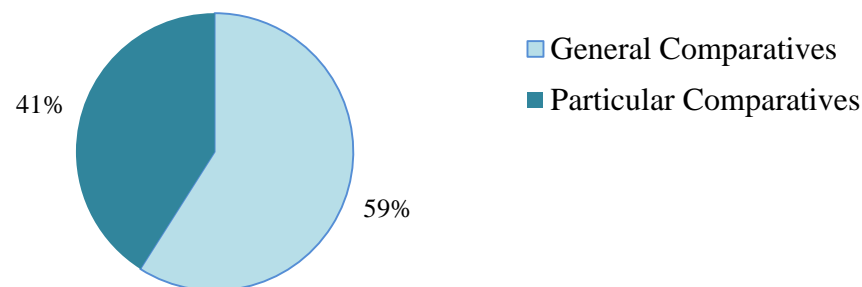
This chapter focuses on the third type of reference – comparatives. The referential function of comparatives is to establish the relation of contrast, i.e. the particular entity is compared to another one, rather than repeated for a second time. Halliday and Hasan (1976:76-77) distinguish two types of comparative reference: general (deictic) and particular (non-deictic). General comparisons express likeness between objects, and this likeness is perceived through identity, similarity, or difference. General comparison is expressed by the use of adjectives or adverbs. The adjectives function as deictic or as an epithet, and adverbs serve the function of an adjunct.

The group of particular comparatives indicates the contrast between the objects according to a particular property. The comparative reference also occurs in the form of adjectives and adverbs that have particular features of quality and quantity (Halliday, 2004:560). Quantity of

the referring expressions belongs to the numerative class of particular comparisons whereas qualitative comparisons appear in the form of an epithet. The distinction between general and particular comparatives is that the former defines objects like or unlike in itself, while the latter defines objects that are quantitatively and qualitatively superior, equal or inferior.

### 3.4.1. The Use of Comparative Reference

The frequency of the comparatives within the investigated texts was the lowest of all analysed types of reference, but such occurrences were still found and make up a number of 543 examples. The analysed texts contained both general and particular comparative reference examples. The corpus analysis suggests that general comparisons were more common than particular, but both types were detected and the difference between their numbers is not very great. Consider the following figure:



**Figure 6. The relative frequency of general and specific comparatives**

The above figure illustrates that there were 59% (320 tokens) of general reference and 41% (223 tokens) of particular reference found in the analysed discourse.

We will start the analysis from the general comparisons that include adjectives: *same*, *similar*, *other*, *different*, and a pronoun *such*. Consider the examples below:

- (41) *Immediately following completion of the second session, participants completed the same set of measures given at baseline. (Annex I, research article 2)*

The comparative reference *same* in this example shows the identity of two objects, i.e. *set of measures*. Because of the comparative adjective *same* it becomes clear that there are actually two sets of measures, therefore it functions as an economy device.

In cases when two or more objects are not identical, but are still alike, the comparative adjective *similar* is used:

- (42) *For example, in a study of college women in the United States, the association between viewing images of thin models and appearance dissatisfaction was moderated by dispositional level of internalization of thinness (Cattarin, Thompson, Thomas, & Williams, 2000). A study of adult women living in the United Kingdom showed similar results for the relation between exposure to images of thinness and body anxiety; women in the high internalization group reported a greater degree of body anxiety than those in the low internalization group (Halliwell & Dittmar, 2004). (Annex I, research article 6)*

Here the adjective *similar* compares the results of the studies from two different countries. The phrase *similar results* refers to the results made in the United States, even though the first sentence does not include the noun *results*, as it is obvious from the context that the whole first sentence is the element that is being compared to.

To set up a comparison of unlike objects the comparative *other* is used:

- (43) *Thus, these items could be responsible for the lower scores of obese children on the global BES scale compared to other children. (Annex I, research article 7)*

The usage of *other* in the above text suggests that there are more groups of children and they are in some way different than the mentioned children on the *global BES scale*.

- (44) *Previous research by Sturges and Hanrahan (2004) has compared data collected face-to-face with telephone interviews and found them to be comparable, but given that the current research had a focus on appearance, it may be different in this instance. (Annex I, research article 8)*

Another way to emphasize unlikeness is to use the comparative adjective *different* as is displayed in the example above. Here two unequal objects: *previous research* and *the current research* occur within the same sentence and are compared by the usage of the adjective *different*. The referring expression simply stresses that the objects are two separate entities. Because the referent *current research* is introduced before the referring expression, this example depicts anaphoric comparative reference.

To compare by characterizing certain objects the pronoun *such* is used:

(45) *Second, the majority of participants represent a particular demographic that is Caucasian and college-educated, and such personal characteristics might not generalize to individuals who participate in other athletic events. (Annex I, research article 6)*

In this instance *such* functions as a determiner for the noun phrase *personal characteristic* and at the same time it refers to the before mentioned description of those characteristics, i.e. *Caucasian and college-educated*. Comparative function of this referring expression is that it could be substituted by the phrase “like that”, thus emphasizing the similarity. Another example to consider:

(46) *Participants were told that the purpose of the study was to examine the effectiveness of a cognitive dissonance based eating disorder prevention program when implemented within an organization, such as a sorority. (Annex I, research article 2)*

Here two different objects that are being compared are *an organization* and *a sorority*. However, this example is based on defining the object rather than comparing it with another.

The analysis of particular comparative reference showed that the most common comparatives found within the analysed science research articles are: *more*, *less*, and *additional*. The first two varied from qualitative to quantitative comparatives:

(47) *However, in contrast to previous prevention programs, the current prevention program was implemented in more naturalistic settings and utilized peer facilitators, which could have resulted in the lack of differences in effect sizes. (Annex I, research article 2)*

The example above displays the usage of the adverb *more* performing the qualitative function of particular comparatives. *More* preceding the epithet *naturalistic settings* compares these *naturalistic settings*, it emphasizes the contrast between previous and current.

(48) *In the objectifying video condition, lower self-esteem was related to (a) a stronger liking of the videos, (b) more identification with the objectified models, (c) increased perception of the objectified women as a source of inspiration for their own appearance, (d) more body-related thoughts, and (e) more social comparison with the objectified models. (Annex I, research article 3)*

The text above presents the quantitative (numerative) particular comparative reference as *more* emphasizes the quantity of objects. *More* means “not the same amount”, thus it refers to something else than it is. The same applies for the following example:

- (49) *While statistical techniques such as multiple imputation allow for retention of the data from participants who did not return for the follow-up assessments, it is preferential to have lower levels of attrition that require less reliance on these statistical techniques. (Annex I, research article 8)*

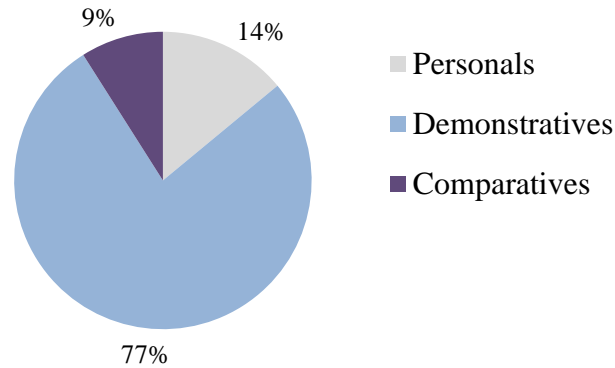
Here, similarly to the example (48), the adverb *less* establishes the difference between objects by comparing them in terms of quantity. *Reliance* serves as the referent while the referring expression *less* implies to different amount of *reliance* than is.

- (50) *Whilst the second author agreed with the subtheme of the de-motivating effects of the slimmer models, she had made the additional interpretation of the seeming irrelevance of the models who were slimmer. (Annex I, research article 8)*

The text above is another example of quantitative comparative reference. The adjective *additional* points to the referent *interpretation* and determines the existence of some other *interpretation* that is not the referent in this example.

The observations made above suggest that comparatives are quite common phenomenon in the genre of science research articles. As well as personals and demonstratives they can be anaphoric and cataphoric, but the latter was more frequent within the analysed discourse. Despite its type all comparisons establish a contrast between two or more objects and this was emphasized in the chosen examples, thus the referential features are not always as clear as those in the personals or demonstratives. Despite this, comparatives are still an important cohesive device that portrays the link between different elements, provides the coherence and serves as an economy device.

In conclusion the corpus analysis of the realization of all reference types: personals, demonstratives, and comparatives in the chosen science research articles was carried out and the results are illustrated in the figure below:



**Figure 7. Relative frequency of reference**

The Figure 7 demonstrates that the majority of reference cohesion consists of demonstratives. The amount of this type of reference accounts for 77% (4690 examples). The use of personals was less frequent as it accounts for 14% (848 examples). The smallest group of reference identified within analysed discourse is that of comparatives with only 9% (543 examples). The comparative analysis enables to draw a conclusion that demonstrative reference is the fundamental mean of creating referential cohesion within the genre of science research articles as it takes up about three fourths of all the collected examples. On the contrary, the personals and especially comparatives are considerably less typical means of reference used in scientific language.

## CONCLUSIONS

Having analysed reference as a cohesive device it is clear that the objectives raised in the introductory part: 1) to examine scientific literature concerning the topic of cohesion; 2) to analyse the chosen science research articles and identify occurrences of reference; 3) to classify the selected instances of reference according to its distinctive types; 4) to reveal the relative frequency of reference in the investigated scientific discourse; have been attained. Respectively, the following conclusions have been made:

- The analysis of the theory of scientific literature helps to understand and define the concept of cohesion, which is in most simple terms, a relation of two or more different elements in the surface text. In accordance to this relation cohesion describes the ways in which text items are mutually connected by grammatical and lexical means. Cohesion as a mean of text-forming is a semantic relation, rather than structural and it makes the text a semantic unit. There are two types of cohesion: grammatical and lexical which correspond to grammar and vocabulary. One of the devices of grammatical cohesion is reference. The main feature of reference is that it refers to some item, regardless of where this item exists, i.e. within the text, or outside the text. Reference is expressed via referring expressions that fall into certain groups of personals, demonstratives and comparatives.
- Personal reference was the second most common reference found within investigated discourse. Its distinction to first, second and third person pronouns revealed, that the first person pronouns included only two referring expressions that occurred in plural form: *we* and *our* that were mostly exophoric because they referred to the participants outside the text. The second person pronouns were non-existent, whereas the third person pronouns were the most frequent and varied in form: from nominal to possessive and objective. The plural pronoun *they* with its inflective forms *their*, *them* and *themselves* made the highest number of collected personals. Occurrences of the third person singular pronouns were considerably fewer, but mostly appeared as *she*, *it*, *one* with their possessive forms *her*, *its*, *one's* the third person pronouns were mostly anaphoric with few exceptions.
- The most frequent reference that was identified belongs to the group of demonstratives, it includes about three fourths of all the collected examples of reference. More than a half of all reference instances is composed of the definite article *the*. Demonstrative pronouns

indicating close objects *this* and *these* were more common than those referring to remote objects *that* and *those*. The least frequent examples of demonstratives are deictic adverbs *here, there, now* and *then*. The latter known as time deixis dominated between the two, as place deixis was almost non-existent.

- Comparatives include the least number of instances but were still identifiable and grouped according to their general and particular referring features. There were more examples of general comparatives: *same, similar, other, different*, and *such*, than particular: *more, less, additional* but the difference between numbers was not very huge. The results of the research reveal that the language of science research articles lack diversity between referring expressions as the collected instances have a clear pattern of their usage.

As a final conclusion it can be stated that reference is an important mean of creating coherent and cohesive text, it also serves as an economy device, as it makes a text more compact. The information collected in this bachelor thesis can be useful in further investigations of reference or cohesion in general. Because of such thorough examination this thesis may help to improve one's understanding of reference and peculiarities of its usage within science research articles.

## REFERENCES

1. Baker, M. (1992). *In Other Words a Coursebook on Translation*. London: Routledge.
2. Beaugrande, R. A. & Dressler, W. U. (1981). *Introduction to Text Linguistics*. London and New York: Longman.
3. Brown, K. (ed.), Anderson, A. H. (ed.), Berns, M. (ed.), Hirst, G. (ed.), Miller, J (ed.). (2005). *Encyclopedia of Language and Linguistics*. 2<sup>nd</sup> ed. Elsevier.
4. Day, R. A. (1998). *How to Write and Publish a Scientific Paper*. 5th ed. Phoenix: Oryx Press.
5. Halliday M.A. K. & Hasan R. (1976). *Cohesion in English*. London: Longman.
6. Halliday M. A. K. (2004). *An Introduction to Functional Grammar*. London: Oxford University Press Inc.
7. Lyons, J. (1995). *Linguistic Semantics. An Introduction*. Cambridge: Cambridge University Press.
8. McCarthy, M. (1991). *Discourse Analysis for Language Teachers*. Cambridge: Cambridge University Press.
9. Saeed, J. I. (2004). *Semantics*. Oxford: Blackwell Publishers.
10. Schiffrin, D., Tannen, D. & Hamilton, H. E. (2001). *The Handbook of Discourse Analysis*. Oxford: Blackwell Publishers.
11. Stubbs M. (2002). *Words and Phrases-Corpus Studies of Lexical Semantics*. Great Britain: Blackwell Publishers.
12. Tanskanen, S. K. (2006). *Collaborating towards Coherence*. Zurich, Switzerland: John Benjamins Publishing Company.
13. Valeika, L. & Buitkienė, J. (2006). *Functional English Syntax*. Vilnius: Vilnius Pedagogical University Press.
14. Valeika, L. (2001). *An Introductory Course in Communicative Syntax*. Vilnius: Vilnius Pedagogical University.
15. Valeika, L., Verikaitė, D. (2010). *An Introduction Course in Linguistic Pragmatics*. Vilnius: Vilnius University Press.
16. Verikaitė, D. (1999). *Formal and Functional Characteristics of Cohesive Devices in the Science Research Articles in English. Doctoral Dissertation*. Vilnius: Vilnius Pedagogical University.

17. Yule, G. (1996). *Pragmatics*. Oxford: Oxford University.

## **DICTIONARIES:**

18. Bussman, H. (1996). *Routledge Dictionary of Language and Linguistics*. London and New York: Routledge.
19. *Longman Dictionary of Contemporary English (LDOCE)*, retrieved from: <http://www.ldoceonline.com>. Accessed on 20 January, 2013.
20. *Merriam Webster Dictionary (MWD)*, retrieved from: <http://www.merriam-webster.com>. Accessed on 20 January, 2013

## SOURCES

The science research articles that were under investigation were taken from the psychology study field journal *Body Image* available at a full-text scientific database *Science Direct*: [www.sciencedirect.com](http://www.sciencedirect.com)

## ANNEX I.

1. Bucchianeri M. M., Arikian A. J., Hannan P. J., Eisenberg M. E. & Neumark-Sztainer D. (2013). Body dissatisfaction from adolescence to young adulthood: Findings from a 10-year longitudinal study. *Body Image*, 10 (1), 1-7
2. Kroon Van Diest, A. M. & Perez M. (2013). Exploring the integration of thin-ideal internalization and self-objectification in the prevention of eating disorders. *Body Image* 10 (1) 16 -25
3. Mischner, I. H. S., van Schie, H. T., Wigboldus, D. H. J., van Baaren R. B. & Engels, C. M. E. R. (2013). Thinking big: The effect of sexually objectifying music videos on bodily self-perception in young women. *Body Image* 10 (1) 26 -34
4. Heron, K. E. & Smyth, J. M. (2013). Is intensive measurement of body image reactive? A two-study evaluation using Ecological Momentary Assessment suggests not. *Body Image* 10 (1) 35-34
5. Tiggemann, M., Slater, A., Bury, B., Hawkins, K. & Firth, B. (2013). Disclaimer labels on fashion magazine advertisements: Effects on social comparison and body dissatisfaction. *Body Image* 10 (1) 45- 53
6. Karr, T. M., Zunker, C., Thompson, R. A., Sherman, R. T., Erickson, A., Cao, L., Crosby, R. D. & James E. Mitchell. (2013). Moderators of the association between exercise identity and obligatory exercise among participants of an athletic event. *Body Image* 10 (1) 70 – 77
7. Shriver, L. H., Harrist, A. W., Page, M., Hubbs-Tait, L., Moulton, M., & Topham, G. (2013). Differences in body esteem by weight status, gender, and physical activity among young elementary school-aged children. *Body Image* 10 (1) 78 - 84
8. Lawson, V. & Wardle, J. (2013). A qualitative exploration of the health promotion effects of varying body size in photographs analyzed using Interpretative Phenomenological Analysis. *Body Image* 10 (1) 85 – 94
9. Cho, A. & Lee, J. H. (2013). Body dissatisfaction levels and gender differences in attentional biases toward idealized bodies. *Body Image* 10 (1) 95 – 102

10. Trottier, K., McFarlane, T., Olmsted, M. P. & McCabe, R. E. (2013). The Weight Influenced Self-Esteem Questionnaire (WISE-Q): Factor structure and psychometric properties. *Body Image* 10 (1) 112- 120