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Semantics of the Modal Verb CAN in Scientific Style

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Z á s a d y   p r o   v y p r a c o v á n í :

Cílem bakalářské práce je prostudovat užití modálního slovesa CAN a jeho významů ve vědeckém stylu. Studentka nejprve na základě odborné lingvistické literatury bude charakterizovat modální sloveso CAN z hlediska morfologie, syntaxe a sémantiky. Zaměří se na vymezení faktorů, na jejichž základě lze jednotlivé významy vyjadřované tímto slovesem odlišit (především na charakteristiku podmětu a lexikálního slovesa). Následně studentka provede analýzu textů vědeckého stylu s cílem popsat kontexty, ve kterých se modální sloveso CAN vyskytuje, a identifikovat kontextové faktory, na nichž je interpretace jednotlivých výskytů závislá. Analýza se bude věnovat podrobné diskusi nejčastěji se vyskytujících významů i nejednoznačných případů. Na závěr autorka objasní užití a sémantiku slovesa CAN s ohledem na analyzovaný funkční styl.

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- Biber, Douglas, Stig Johansson, Geoffrey Leech, Susan Conrad and Edward Finegan. 1999. Longman Grammar of Spoken and Written English. London: Longman

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Souhlasím s prezenčním zpřístupněním své práce v Univerzitní knihovně.

V Pardubicích dne 10. 1. 2017

Jana Nedobylová

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ANNOTATION

The aim of this paper is to map various uses of the modal verb CAN and its meanings in scientific style. The first part of this paper describes the modal verb CAN morphologically, syntactically and semantically. This part primarily explains the individual meanings of CAN, which is reflected in the analysis later in the second part of the paper. The meanings are analyzed based on the contextual factors which determine the particular meaning. The paper also includes a discussion of borderline cases. Conclusion of this paper summarizes the quantitative and qualitative results of the use of the modal verb CAN with regards to the particular functional style.

KEYWORDS

modality, deontic, dynamic, epistemic, meaning, modal verb *can*, scientific style

NÁZEV

Sémantika modálního slovesa CAN ve vědeckém stylu

ANOTACE

Cílem této práce je zmapovat různá užití modálního slovesa CAN a jeho významy ve vědeckém stylu. První část této práce popisuje modální sloveso CAN z hlediska morfologie, syntaxe a sémantiky. Především se tato část zabývá vysvětlením jednotlivých významů CAN, což je promítnuto v analýze, která tvoří druhou část práce. Významy jsou v analýze popsány na základě kontextových faktorů, které rozhodují o daném významu. Práce se věnuje i diskusi o nejednoznačných případech. V závěru práce jsou výsledky užití modálního slovesa CAN shrnuty jak kvantitativně, tak kvalitativně s ohledem na daný funkční styl.

KLÍČOVÁ SLOVA

modalita, dispoziční, dynamická, jistotní, význam, modální sloveso *can*, vědecký styl

Table of Contents

Introduction

The primary aim of this paper is to describe and analyze multiple uses of the modal verb *can* in scientific style. The paper consists of two parts, a theoretical background, which comprises of three chapters and several subchapters, and an analysis based on a selected corpus, reflecting the principles reported on in the first part of the paper.

In the first chapter, the concept of modality will be explained and also the kinds of modality will be considered in the following subchapters. The most common distinction between deontic and epistemic modalities will be mentioned, however, also dynamic kind of modality will be involved as it is linked with one of the meanings of *can*. Thus, several different approaches are introduced along with their specific terminology. Furthermore, some of the typical features occurring within each kind of modality will be considered.

The second chapter deals with modal verbs in general and denotes their properties, especially those of the central group of modal verbs that includes *can*. Here the modal verb *can* is focused on in more detail to describe its particular meanings. There are three subchapters that will discuss the issues and factors of each meaning of *can*, i.e. possibility, ability, and permission.

Thirdly, there is a chapter on stylistics, denoting the function and features of scientific texts. Since there are many forms of scientific discourse differentiated especially in medium, this paper will concentrate on the written scientific texts. This chapter on style also comments on the important and frequent use of *can* as a hedging device in scientific texts.

Consequently, the fourth chapter represents the analytical part which will aim at mapping the frequency of modalities, meanings and features corresponding to them. These will be discussed and summed up in several subchapters including the borderline cases as well. The selected corpus is a compilation of 150 tokens of *can* extracted from five academic books. Their field of science can be generally labeled as linguistics.

In addition, example sentences and paraphrases of the diverse uses of *can* will be noted throughout the whole paper in order to demonstrate or exemplify the proposition or actual findings. In the first part, the examples will be extracted from the source material referred to in References and cited accordingly. The examples in the second part will be sourced from the data corpus. All examples in both parts are therefore completely authentic and numbered chronologically; in each part according to two separate lists. At the end of the paper in

Appendices, there can be found a data corpus of all tokens and also the tables concluding the findings.

1. Modality

Modality is a crucial term for this paper, so that it will be clarified in this chapter. In general, Palmer classifies modality as a „semantic-grammatical category" which „is expressed in English by the modal verbs" (1990, 1-2). Modal verbs are further discussed in the second chapter of this paper. Further, Lyons (1977, 452) suggests that modality is linked to the speaker's „opinion and attitude towards the proposition that the sentence expresses or the situation that the sentence describes". As Quirk et al. state, „modality may be defined as the manner in which the meaning of a clause is qualified so as to reflect the speaker's judgment of the likelihood of the proposition it expresses being true" (1985, 219). From the above-mentioned definitions it may be assumed that modal expressions indicate a particular degree of speaker's opinion or attitude towards the proposition uttered.

Modality can be expressed by lexical or grammatical means. The former can be represented by the utterance of *probably* in (1) and the latter may be found in (2) where the modal verb *might* was used to interpret the meaning of the first sentence by the grammatical means:

(1) It's *probably* the case that imported versions are cheaper.   (Cruse 2004, 298)

(2) It *might* be the case that imported versions are cheaper.

In this paper, only the grammatical device for expressing modality will be investigated, which involves the modal verbs, particularly the verb *can*.

1.1. Kinds of Modality

English linguists basically distinguish two core kinds of modality. These can be labeled by several different terms, even though the concept is always the same. For this paper, only one of the multiple approaches to terminology will be used, i.e. deontic and epistemic modality. This terminology is commonly used by Huddleston and Pullum, Palmer, Lyons, or Cruse in their studies and will be explained in the following subchapters.

On the contrary, Biber et al. refer to these modalities as intrinsic and extrinsic (1999) where the former equals to deontic and the latter to epistemic kind of modality. Another terminology has been introduced by Webster and Halliday in their study of meaning – imperative and indicative modality, where imperative refers to deontic and indicative to epistemic. To comprehend this

approach, imperative meaning can be interpreted in the sense of „this is how things should be" and the indicative meaning „this is how things are", as far as the speaker knows (2014, 170). Deontic modality is also referred to as root modality by Leech (2004, 84) due to its „basic and ordinary" nature; epistemic modality as a term remains unchanged in his approach. Palmer (1990, 36) also suggests another point of view, referring to deontic modality as a discourse-oriented one, since the source of modality „may be the hearer (addressee) as well as the speaker" (1990, 70).

In addition to these two modalities, a few scholars (e.g., von Wright, referred to in Palmer 1990) distinguish even the third kind, dynamic modality. For instance, Palmer specifies this modality type as subject-oriented due to its focus on „the ability or volition of the subject of the sentence, rather than the opinions (epistemic) or attitudes (deontic) of the speaker (and addressee)" (1990, 36). Dynamic (or subject-oriented) modality relates especially to two central modals, *can* and *will*, however, is not involved in the linguistic approaches of many authors (e.g. Leech). Although this kind of modality is not widely recognized, it will be considered when analyzing the ability meaning of *can*, also in spite of the fact that Palmer (1990, 7) argues that dynamic kind should not be labeled as modality in a broader context. He states that it „is concerned with the subject of the sentence" rather than with the speaker. All in all, dynamic kind of modality will be referred to later (in the subchapters 2.2.1.1. and 2.2.1.2.).

1.1.1. Epistemic Modality

According to Huddleston and Pullum, epistemic modality „concerns the speaker's attitude to the factuality of past or present time situations" and thus „involves qualifications concerning the speaker's knowledge" (2002, 178). It simply expresses the speaker's opinions and beliefs based on his own judgements or assumptions sourced from his knowledge or available evidence. That can be demonstrated in the sample sentences (3) and (4) as they follow:

(3) He *may* come tomorrow.
(4) He *must* be in his office.

(Palmer 2001, 19)

Basically, epistemic modality comprises of two meanings, i.e. possibility and necessity. Respectively, in (3) *may* expresses possibility and *must* in (4) expresses necessity. In these very utterances, possibility can be paraphrased as *It is possible that he comes tomorrow*, and necessity as *The only possible conclusion is that* or even *It is probable that he is in his office*

(Leech 2004). Regarding epistemic necessity, some scholars may tend to associate it to the concept of certainty. Nevertheless, Palmer (1990, 53) denies such approach, as certainty can be rather equated with hundred per cent probability, which is not exactly the case. Moreover, epistemic necessity should be rather referred to as „logical necessity", (Leech 2004, 80-81) as its paraphrase can be *There is no other explanation possible than that*. It implies a logical consideration of all possibilities, while the speaker eventually assumes that only one of them is necessary the case. Logical necessity can be exemplified in (5) and (6):

(5) There *has to* be some reason for his absurd behaviour.   (Leech 2004, 80)

(6) Someone *must* be telling lies.   (Leech 2004, 83)

When it comes to epistemic possibility, it can also be labeled as factual possibility (indicated by *may*) in contrast to the deontic possibility (to be discussed later), labeled also as theoretical possibility (indicated by *can*) (Leech 2004, 85). In order to clarify the term properly, both types are compared here and demonstrated on the examples below:

(7) The road *may* be blocked. = It is possible that the road is blocked. (factual possibility, present time reference)

(8) The road *can* be blocked. = It is possible for the road to be blocked. (theoretical possibility, future time reference)

(Leech 2004, 82)

Therefore, it can be concluded that epistemic modality is of very subjective nature (Lyons 1977, 792), refers to propositions rather than events or actions (Palmer 1990, 50), and the proposition always retains a particular degree of the speaker's commitment to what he says. According to Biber et al. (1999, 485), subjects of the sentences with epistemic meaning are usually non-human or inanimate at all, and the meaning of the main verb is usually stative. Because this paper focuses on the modal verb *can*, it is deontic modality that should be discussed in more detail.

1.1.2. Deontic Modality

Firstly, compared to the epistemic kind, deontic modality „concerns the speaker's attitude to the actualisation of future situations" and deals with „imposing obligation or prohibition, granting permission" and so on (Huddleston and Pullum 2002, 178). Moreover, modals with deontic meaning refer to the actions and events controlled by animate (usually human) agents of the main verb, and secondly, the main verb of the verb phrase „is usually a dynamic verb,

describing an activity or event" rather than a proposition (Biber et al. 1999, 485). That can be found in the examples below:

(9)   He *must* come tomorrow.

(10)   You *can* smoke in here.

<div align="right">(Palmer 2001, 103)</div>

Secondly, the modal verbs with deontic meaning are also marked with a certain degree of subjectivity in the sense that „the speaker is the one who obliges, permits, or forbids" (Palmer 1990, 7). This implies the following deontic meanings as Leech (2004, 84-85) refers to them: permission marked by *may* and *can*, (theoretical) possibility marked by *can*, obligation and necessity (also labeled as requirement), both typically marked by *must* and *have to*. The statements below demonstrate the deontic meanings one by one, paraphrased by the parallel statements in the brackets:

(11)   Some of you *can* stay out late.   (deontic permission)
          (= Some of you *are allowed to* stay out late.)

(12)   The illness *can* be fatal.   (deontic „theoretical" possibility)
          (= *It is possible for* the illness to be fatal.)

(13)   I *must* go now, or I'll be late.   (deontic obligation)
          (= I *am obliged to* go now, or I'll be late.)

(14)   The garden *has to* be watered every day.   (deontic necessity, „requirement")
          (= *It is essential* / *It is necessary* to water the garden every day.)

<div align="right">(Leech 2004, 78-82)</div>

As for the utterance (11), permission can be granted also by means of the verb *may*, which is usually regarded as a formal expression and a more polite form of the meaning (Leech 2004, 75). The example in (12) merely admits the possibility that the illness could be fatal if some conditions or prerequisites were met. The event or action is indicated to be possible but it does not necessarily happen. (Wallwork 2013, 85). In (13) and (14) *must* and *have to* are stated here in order to briefly introduce deontic obligation and necessity. Palmer (1990, 8-9) suggests that the deontic meanings mentioned in the brackets above can be grouped under the concepts of possibility and necessity, which are central to both deontic and epistemic modality. In other words, both permission and theoretical possibility are the notions of possibility, and both obligation and necessity (requirement) are the notions of necessity.

This paper will further analyze the notions of possibility in more depth (in the subchapter 2.2.1.), as they are relevant for the verb *can* and its usage.

2. Modal Verbs

This chapter should provide a brief insight into the distinction of modal verbs and their basic properties in the function of auxiliary verbs.

Primarily, in order to distinguish the groups of the modals, Biber et al. (1999, 483–4) suggest that there are nine central modals (including *can, could, may, might, will, would, shall, should,* and *must*), four marginal auxiliary verbs (including *need to, ought to, dare to,* and *used to*), and several semi-modals (including *had better, have to, have got to, be supposed to,* and *be going to;* possibly including also *want to, be able to, be obliged to, be likely to,* and *be willing to).* The approach found in Quirk et al. (1985, 137) has a very similar outline. Nevertheless, the verbs of the last two groups are used for purposes similar to those of the central modal verbs. The classification of the verbs may slightly change with different viewpoints of certain grammarians; for instance, Palmer (1990, 3) involves only *dare* and *need* among the marginal modals, and at the same time the group of semi-modals (labeled as the modal verbs "of varying status") can be even extended by *be bound to, is to,* and *used to*.

However, regarding the focus of this paper, it is much more relevant to discuss an area of the central modal verbs in the next subchapter which would describe a general background to the usage of these verbs.

2.1. Properties of Central Modal Verbs

To begin with, Leech (2004, 72–73) speaks about two sets of forms of the central modals; the first one to be referred to as a present or primary form of the modal (*can, may, must, have to, will,* and *shall*), and the other one to be referred to as a past or secondary form (*could, might, would,* and *should*). In the same way, Dušková (1988, 181) makes the distinction between present and preterite forms. With regards to the functions of the particular verbs, the terms present and past/preterite forms are misleading. For instance, the present forms can refer to future apart from present time reference, and the past forms can signal something very different from time reference; this can be seen in (15) marked by *can* and *could*. Thus, they should be rather labeled primary and secondary forms (Leech 2004, 73). For further clarification of the use of *could* in (15), the secondary forms can be used to refer to present or future time (not

exclusively to past time), (Dušková 1988, 181). Then the forms are usually used in remote conditionals as in (16) and also to indicate modal remoteness as in (17):

(15)   She *can* go.   (Quirk et al. 1985, 137)

          Could you move it?   (Huddleston and Pullum 2002, 107)

(16)   If you came tomorrow, you *could* help with the flowers.

(17)   I wish you *could* move it.

(Huddleston and Pullum 2002, 107)

Regarding the morphological and syntactic criteria of the selected modal auxiliaries, they are listed below as well as in Quirk et al. (1985, 137). Moreover, these examples are contrasted with those of the main verbs as follow:

(a) bare infinitive verb form in the verb phrase

    I *can go*.   ~~I can to go.~~   I *hope to go*.

(b) no non-finite forms of the modals, only primary forms (Huddleston and Pullum 2002)

    ~~to can/canning/canned~~   *to hope/hoping/hoped*

(c) no –s form in the 3rd person singular of the modal

    She *can go*.   ~~She cans go.~~   She *hopes* to go.

(d) abnormal time reference, as discussed above

    You *could* leave this evening. (not past time reference)

    You *hoped* to leave this evening. (past time reference)

(Quirk et al. 1985, 137)

In addition, Palmer (1990, 4) discusses some more criteria of the modals which are common with other auxiliaries. These criteria labeled with an acronym "NICE" can be found and exemplified below:

(e) negative form with –n't

    He ca*n't* come.

(f) inversion with the subject in questions

    Must he come?

(g) code

He will come and *so will she*.

(h) emphatic affirmation

He *may* come.

Also no co-occurrence should be involved among the criteria as shown in (18), which differentiates the modals from the primary auxiliaries (*be*, *have* and *do*).

(18)   ~~He may will come.~~

(Palmer 1990, 4)

Last but not least, modal verbs cannot be used to indicate modality in imperative sentence structures, simply because they themselves contain a kind of modal meaning already, in the sense that the event or action is meant to be necessary or needed. That can be exemplified below.

(19)   Be careful!   (imperative sentence)
(20)   You *must* be careful! (paraphrase by using the modal verb *must*)

(Dušková 1988, 185)

To sum up, the most important points of syntactic usage and morphology of central modal verbs (i.e. sentence structure, criteria of auxiliary verbs, morphology of *can*, and distinctive usage of *could*) have been briefly outlined. Next subchapter focuses on the modal verb *can* in particular.

2.2. Modal Verb CAN

As has been explained in 2.1., the modal verb *can* belongs to central modal verbs. In the following subchapter, various features of *can* will be discussed, especially its different kinds of meaning will be denoted in the latter parts of this subchapter.

In the first place, the modal verb *can* takes the full negative form *cannot* or its contracted version *can't* (Dušková 1988, 183). *Can* has also its past counterpart, *could*, which does not necessarily refer to past, as has been noted already. All forms can be identified in the following statements:

He *can* speak French.   (Huddleston and Pullum 2002, 178)

I *cannot*/*can't* believe it.   (Biber et al.1999, 492)

I *couldn't* feel my hand.   (Biber et al. 1999, 493)

The references of *could* are qualified by Dušková (1988, 189) as preterite and present conditional forms. Their distinctive interpretations lie in the fact whether the utterance of *could* is a reading of the ability itself with past time reference, or it can refer to present or future time (present conditional); both readings can be seen in (21) below.

(21)   *Could* you move it?

(i) Would you be able to move it?

(j) Were you able to move it?

(Huddleston and Pullum 2002, 107)

However, *could* as a modal verb should be analyzed separately, so that the next part will concentrate on the modal verb *can* only and its more or less distinctive meanings. Primarily, the subchapter dealing with possibility meaning of *can* will be structured into several thematic sections, which should make this relatively extensive subchapter more coherent.

2.2.1.   Meanings of CAN

2.2.1.1. CAN – Possibility

INDETERMINACY OF POSSIBILITY

The first of the meanings, possibility, is the most common one of them. Leech (2004, 73) even suggests that sometimes there are very fuzzy boundaries among all three meanings, for instance, between possibility and ability meaning (as indicated in (22)). With usage of *can*, it is usually difficult to draw a dividing line between one and the other meaning, especially between possibility and the other two of them, which is eventually decided based on the context. The following subchapters dealing with ability and permission discuss the so-called gradients of inherency and restriction that are referred to in Coates (1983); her approach to the senses will provide basic insight into the indeterminacy issue.

(22)   No one *can* see us here.

(k) It isn't possible for anyone to see us here.   (possibility reading)

(l) No one is able to see us here.   (ability reading)

(Leech 2004, 73)

Most scholars argue that each of the meanings is concerned with "distinctive syntactic and semantic properties" and "types of paraphrases" (Collins 2007). For better demonstration of

the multiple ways of reading, there are three interpretations of (23) below; the intended meaning to be chosen upon the context as usually.

(23)   John *can't* live here.
(m) John is not able to live here.   (ability reading)
(n) John is not permitted to live here.   (permission reading)
(o) It is not possible that John lives here.   (possibility reading)

(Collins 2007)

Due to such discrepancies between the actual meanings, several principal features should be assigned to possibility meaning first, in order to distinguish it more easily from the other ones.

Firstly, some authors claim that *can* expresses dynamic possibility divided as either subject-oriented in the sense of ability, dynamic implication (both to be discussed later), or neutral possibility (Papafragou 1998, 3; Collins 2007). The last of them is also denoted as circumstantial (Palmer 1990, 83) or theoretical possibility (Collins 2007; referred to as deontic possibility in Leech 2004, 85). Description of possibility meaning of *can* is rather a matter of selected terminology, so that circumstantial possibility can be directly linked to deontic possibility in a general sense.

CIRCUMSTANTIAL POSSIBILITY

Nevertheless, strictly speaking, this kind of possibility can be clearly recognized if the sentence contains a general subject, e.g. you (as in (24)) or one (as in (25)), or passive voice is used. In addition, *can* in this possibility sense commonly occurs with adjectives and adverbs often in comparative or superlative forms, which indicates a certain "degree or extent that an action is possible" (Palmer 1990, 84). Therefore, the description "circumstantial possibility" is much more appropriate, as it is the circumstances that qualify the possibility and specify its scale. An example sentences can be found below. In addition to the circumstantial description, Collins (2007) in (25) mentions enabling (or rather disabling) circumstances, i.e. *there is no airport*, as an explicit justification for theoretical (i.e. deontic) possibility use of *can*.

(24)   You *can* get lost.
         (= *Under a particular set of circumstances*, it is possible for anyone to get lost.)

(Papafragou 1998, 3)

(25)   One *cannot* fly into Zermatt, there is no airport.

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(= *Provided that there is no airport*, it is not possible for anyone to fly into Zermatt.)

(Collins 2007)

(26)   It is really a matter of how quickly *can* we get the surveyor to move.
(= It is really a matter of how quickly is it possible for us to get the surveyor to move.)

(Palmer 1990, 84)

According to Leech, *can* in its deontic possibility sense is paraphrasable by *It is possible* + (*for* + Noun Phrase +) *to* + Infinitive clause (2004, 82). This might be found in the examples above in the paper ((8) and (12)) or in (27) below. Basically, the utterance of *can* in (27) is a clear example of theoretical possibility that has been explained already. At the same time, it can be considered a rather general statement uttered as an observation about expert drivers (Leech 2004, 83).

(27)   Even expert drivers *can* make mistakes.
(= It is possible for even expert drivers to make mistakes.)

(Leech 2004, 74)

EPISTEMIC POSSIBILITY

Moreover, possibility meaning can be frequently found in its negative form *cannot* or *can't* as shown in (28). In such non-affirmative cases (negatives and questions), Collins (2007) assumes that *can* may even express *epistemic* possibility in the sense of a "missing form in the epistemic *must* paradigm," since inversely "in negative contexts, must and need are usually interpreted deontically" (Huddleston and Pullum 2002, 181) as put in contrast in (29). Because the concepts of possibility and necessity are inverse, only non-affirmative uses of *can* can be read epistemically. The below statements with *can* in (28) and (29) can also be paraphrased as *There is no other explanation possible than that she is not working at this hour!* or *I can't believe that he has done it deliberately!*. Actually, Leech argues that the epistemic meaning applies merely to the construction which follows the modal verb (2004, 99-100).

(28)   She *can't* be working at this hour!

            (= It is not possible/It is impossible that she is working at this hour!)

<div align="right">(Leech 2004, 74)</div>

(29)   He *must* have done it deliberately!   (logical necessity)

            He *can't* have done it deliberately!   (possibility)

<div align="right">(Huddleston and Pullum 2002, 180)</div>

In some questions and negative sentences, *can* expresses factual possibility instead of *may*, as indicated in (30). Therefore, in such structures theoretical and factual possibility tend to merge with each other and cannot be readily distinguished (Leech 2004, 92). Rarely, *can* occurs in the modal usages with perfect and progressive aspects as in (31) and (28) which signal current possibility of an event or state with "variable time and aspect".

(30)   (They *may* be asleep.)

            Can they be asleep?

<div align="right">(Leech 2004, 92)</div>

(31)   What *can* have happened?

<div align="right">(Leech 2004, 100)</div>

SYNTACTIC FEATURES OF POSSIBILITY

Furthermore, possibility meaning of *can* occurs in colloquial utterances with second- or third-person subjects, functioning as a „familiar though tactful imperative" (as in (32)), or with a first-person subject, expressing an offer (as in (33)) (Leech 2004, 74). Supposedly, this kind of usage will not occur in the analysis of this paper because of the different register.

(32)   You *can* be standing over there.

(33)   I *can* give you a hand for a few minutes, if you need help.

<div align="right">((Leech 2004, 74)</div>

Once again, Coates (1983, 96) mentions a frequent usage of *can* in passive voice, especially in written language, and she also specifies that possibility meaning of *can* occurs "when the speaker cannot presuppose the willingness of the subject to carry out the proposition that the passive is found", as shown in (34) below:

<div align="center">21</div>

(34)   We believe that solutions *can* be found which will prove satisfactory.

<div align="right">(Coates 1983, 96)</div>

Especially in academic scientific texts, *can* is marked by a sense of logical possibility when the modal occurs exactly with passive voice (Biber et al. 1999, 499). These constructions can be found either with short agentless passives (as in (35)) or long passives involving a nominalized process, i.e. the by-phrase (as in (36)). In both instances, it is obvious that the human agent of the main verb is not important and hence it is not mentioned (for multiple distinctive reasons); the action is simply reported as feasible, conceivable, or to be precise with terminology, logically possible. As a result, possibility reading of *can* is mostly recognized when the agent is avoided by using the passive structure.

(35)   Each interpretation *can* be seen generally to pow through the abbreviated text as a whole.

(36)   Marked improvements in yield *can* be obtained in one or two seasons by selection based upon a single character.

<div align="right">(Biber et al. 1999, 499-500)</div>

Consequently, Leech (2004, 75) confirms that *can* in its possibility meaning typically requires an inanimate subject (as in (37)) unlike the other two meanings, ability and permission. Likewise, *can* uttered with inanimate subjects and passive voice naturally determines the meaning as deontically potential, i.e. possibility (Papafragou 1998, 22). Again questions with *can* are usually marked as polite requests which can be even strengthened by the adverb *possibly* as in (38).

(37)   Appearances *can* be deceptive.

(38)   *Can* you possibly lend me an umbrella?

<div align="right">(Leech 2004, 74-75)</div>

For Palmer (1990, 84-85) in possibility use of *can* "there is no obstruction to the action of the lexical verb", which has not just present time reference but is rather regarded as timeless, indicated by the paraphrase *There is always the possibility that* and exemplified in (39).

(39)   You *can* always say it's just not your style.

<div align="right">(Palmer 1990, 85)</div>

In contrast to that, Leech (2004, 74) asserts that *can* is also paraphrasable by adding the adverb *sometimes* as described in the example (40) below:

(40)   Lightning *can* be very dangerous.

         (= Lightning is sometimes very dangerous.)

<div align="right">(Leech 2004, 74)</div>

This example leads the discussion to one more distinction of possibility interpretation, i.e. rational and existential.

RATIONAL AND EXISTENTIAL POSSIBILITY

As has been noted, theoretical possibility can be even divided into rational and existential modalities (Collins 2007). Rational use of *can* relates much to "objective deontic possibility, with actualization being licensed by general societal or cultural considerations," and this use also commonly occurs with negative form of *can* as denoted in (41). It is usually found in utterances including the first-person subject, the general you as a subject or the subject is something with which the speaker identifies himself (Palmer 1990, 105). The propositions are not clearly impossible but unacceptable or unreasonable. On the other hand, existential possibility appears with the quantifiers *some* and *all* when being paraphrased, so that the described situation takes place *sometimes* or the situation applies only to *some* members of the particular group (Collins 2007), it can be referred to in the above-mentioned (37) and (40), and also in (42) and (43) below.

(41)   These are terms we *cannot* accept. No British government should, no Labour government would. These terms are unacceptable.

<div align="right">(Palmer 1990, 105)</div>

(42)   Lions *can* be dangerous.

         (= *It is possible for lions to be dangerous. = Some lions are dangerous.*)

<div align="right">(Palmer 1990, 107)</div>

(43)   (…) Someone who spends a lot of time away from the home should probably have a second cat, as they *can* get destructive if bored.

<div align="right">(Collins 2007)</div>

On the other hand, *can* may express even more beyond the field of semantics, thus pragmatics is taken into consideration, for instance, there are example sentences in (44) and (45). In terms

of pragmatics, these examples are not intended to be read as ability (Are you able to pass the salt?) or as permission (Do you allow me to get you a drink?); it can be interpreted rather as an immediate request and an offer. Nevertheless, this is not the principal subject of the analysis here.

(44)   *Can* you pass the salt?

(45)   *Can* I get you a drink?

(Papafragou 1998, 4-5)

DYNAMIC IMPLICATION

Taking back to dynamic implication that has been mentioned at the beginning of this chapter, Palmer states that this use implies that "what is possible will, or should, be implemented" (1990, 86). Regularly, it expresses an offer as in (46), which is used rather in spoken language.

(46)   Yes, we *can* send you a map, if you wish.

(Palmer 1990, 86)

In order to make a brief conclusion, possibility interpretation of the verb *can* can be signaled by using passive voice (often agentless), inanimate subject, or negative construction to express impossibility of an action. It can be paraphrased by using some adverbs (always, sometimes) and it also co-occurs with comparative or superlative forms of adjectives or adverbs. Very rarely, though, *can* combines with perfect or progressive aspect only in case it is current possibility. It also may be used with a kind of general subject like *you* or *one*.

2.2.1.2. CAN – Ability

As has been mentioned already, many scholars argue that ability reading of *can* merely conveys the basic meaning of the verb (Papafragou 1998, 21). In fact, its ability meaning is closely related to its possibility meaning, since logically thinking, if someone has the ability to do something, then something is possible. However, *can* in ability reading requires an animate (usually human) subject and active voice, which could be contrasted in the examples (47) of possibility and (48) of ability (Leech 2004, 75).

(47)   This game *can* be played by young children.

(48)   (Even) young children *can* play this game.

In addition to that, the animate subject has commonly agentive function (Coates 1983, 89), and as Leech (2004, 74) suggests, *can* in ability meaning should be paraphrased by *be capable of*, or by *know how to* as paraphrased in (49).

> (49)   You *can* work harder than this.
>
>   (= You *are capable of* working/*know how to* work harder than this.)
>

Secondly, Leech also asserts that ability (and permission) meaning is not associated with perfect or progressive aspects (2004, 99), as it is clearly incompatible with these aspects. Moreover, with the verbs of inert perception (feel, hear, see, smell, taste), the modal verb *can* gains a "special function of denoting a state rather than an event", referring rather to an instantaneous event, as shown in *I can see a bus in the distance* (Leech 2004, 28). Similarly, when *can* is used with verbs of inert cognition (like *believe, forget, think, know, suppose, understand*, etc.), there is little difference between being able to do it and actually doing it as exemplified in *I remember/I can remember* (Leech 2004, 75). In this matter, Huddleston and Pullum (2002, 185) propose a distinction between two subcases of ability meaning, i.e. potential, as in *She can run the marathon in under three hours*, and currently actualized, as in *I can hear something rattling* (Huddleston and Pullum 2002, 185). The latter one has just been clarified; use of modalized or unmodalized version of the utterance is decided upon the required pragmatical purpose, whereas the former case can be used "on the basis of a single marathon under three hours", or it may convey a mere "potential in training" as well (Huddleston and Pullum 2002, 185). However, potentiality and actualization are closely related concepts, as "the latter provides the evidence for the former" (Collins 2007), as denoted in *He can still play the piano but he never plays it*. Conversely, the use of *can* in (50) implies "potentiality from actualisation"; here if the modalized and unmodalized versions are compared, there is hardly any change in the meaning (Collins 2007).

> (50)   *Can* you speak any East European languages?   (modalized)
>
>   (Do you speak any East European languages?)   (unmodalized)
>

Another point has been made by Palmer (1990, 85); if ability meaning is labeled as subject-oriented, it can occur with animate subjects (ability) as well as with inanimate subjects where ability is inappropriate interpretation. In this context the subject is rather having "the necessary

qualities or power to cause the event to take place" as can be demonstrated in (51) below. This point has been supported by Coates (1983, 90), since *can* with the inanimate subject still can refer to the inherent properties of the subject, which is demonstrated in (52).

(51)   Religion *can* summate, epitomize, relate, and conserve all highest ideals and values.

(Palmer 1990, 85)

(52)   The plane has a built-in stereo tape recorder which *can* play for the whole four hours it will take to fly to Majorca.

(Coates 1983, 90)

Sometimes, as Palmer (1990, 85) confirms, it is not clearly decidable whether the meaning of *can* should be interpreted as subject-oriented ability or neutral (deontic) possibility, i.e. whether the subject of the sentence is able to perform the action, or the sentence indicates mere possibility of the action in question. Such ambiguity in interpretation may be seen in (53).

(53)   One thing you want to avoid, if you possibly *can*, is a present from my mother.

(Palmer 1990, 85)

Similarly as with possibility meaning, negative forms of *can* are used to indicate inability in a sense of not being able to do something, as shown in (54), which can be paraphrased as *He is not able to drive a car*. As for interrogatives, *can* often conveys ability meaning in indirect requests, typically when used with a second-person subject as exemplified in (55) (Huddleston and Pullum 2002, 205).

(54)   He *can't* drive a car.

(Leech 2004, 94)

(55)   *Can* you help me?

(Huddleston and Pullum 2002, 205)

In order to distinguish ability from possibility sense of *can*, Coates (1983, 93) suggests the undecidable cases to be interpreted in terms of gradients, and hence the gradient of inherency is assigned to the cases balancing between ability and possibility meaning. In such cases, "ability can be considered a special case of possibility due to some skill or capability of the

subject referent", therefore, it is a set of external factors and inherent characteristics of the subject, determining the action to be performed (Huschová 2014, 92-93). This gradient can be found in the example (56) below.

(56)   It's far worse for those people left at home not knowing if they are going to be safe or even if they *can* get back.

(Huschová 2014, 92)

This issue will be referred to again in the Analysis further in this paper. To briefly sum up, ability meaning can be basically represented by an animate subject with agentive function, the gradient of inherency, or active voice.

2.2.1.3. CAN – Permission

To begin with, in Leech's diagram (2004, 73) he distinguishes ability as a particular kind of possibility, and at the same level he separates permission as a branch of possibility. Logically, what is permitted is possible. To compare permission with possibility, the distinction between them is rather gradient or scalable than an absolute one (Leech 2004, 85; Coates and Leech 1980, 29). In the same manner as with ability sense, Coates (1983, 93) has set the second gradient representing the undecidable cases of permission and possibility, i.e. the gradient of restriction. These borderline cases are also linked to both meanings, "since permission can be viewed as granted possibility" (Huschová 2014, 92), and they will be discussed in the Analysis as well as the tokens related to the gradient of inherency. An example of this gradient is in (57) below.

(57)   Moreover, these powers all have weaknesses. They are overwhelmingly focused on individual offenders. Most *can* only be used against offenders who have been convicted and only apply to the period of their sentence.

(Huschová 2014, 93)

Although some enabling circumstances can be found, which is typical for possibility, it can be identified as permission to a certain extent, specifically in terms of rules or regulations (similarly as in (58)). Thus, the modal verb *can* can also be linked to the present situations, even though deontic modality primarily refers to the future situations. However, the permitting authority is not clearly stated here along with passive voice and inanimate subject; on the contrary such features are the attributes of possibility reading rather than that of permission (Huschová 2014, 92). That implies that *can* in its permission meaning commonly

occurs with active voice and animate subjects (possibly human) as well as ability meaning does (Leech 2004, 75).

(58)   We *can* borrow up to six books at a time.

<div align="right">(Huddleston and Pullum 2002, 183-184)</div>

Basically, this sense of *can* is the least common one of all (Leech 2004, 75). In fact, deontic permission meaning of *can* would be much better represented in spoken than in written language (Coates and Leech 1980, 27). Actually, permission uses of *can* are usually interpreted as below in (59):

(59)   You *can* stay here as long as you like.

          (= You*'re allowed to* stay here as long as you like.)

<div align="right">(Leech 2004, 75)</div>

Nevertheless, *can* in its permission sense occurs much more frequently in questions instead of *may* (as in (60)), since *may* appears in more formal and polite contexts (Leech 2004, 83). Likewise, such questions are commonly used as indirect requests, e.g. for permission, as in (61). Due to its informal use with permission sense, *can* is very rarely found in academic style.

(60)   May I speak to …? / *Can* I speak to …?

<div align="right">(Leech 2004, 83)</div>

(61)   *Can* I go with him?

<div align="right">(Huddleston and Pullum 2002, 205)</div>

As already mentioned, *can* in its permission reading is not used with perfect or progressive aspects, it is related to the simple aspect only (Leech 2004, 99). When it comes to deontic possibility, i.e. permission, it can only refer to present or future situations because of its performative nature; granting permission takes place at the moment of an utterance (Palmer 1990, 70). Likewise, deontic modality can express either objective or subjective permission. The former is usually used with rules and regulations, and the latter is influenced by subjectivity of the speaker granting permission (as in (62)). The most important difference arises from "laying down a rule" in (58) and "merely reporting one" in (62) (Huddleston and Pullum 2002, 183).

(62)   You *can* have one more turn.

<div align="right">(Huddleston and Pullum 2002, 183)</div>

The objective sentences often occur with the first-person subjects, however, it cannot be generally applied. Regarding negative forms of *can*, an utterance as in (63) can be subjectively interpreted in terms of prohibition or restriction, as opposed to granting permission. In contrast to the verb *may*, *can* in its negative form does not "often keep the implication of the speaker's authority", therefore, an action is not necessarily restricted by the speaker (Leech 2004, 95).

(63)   You *can't* attend the lectures.
          (= You are not permitted to attend the lectures)

<div align="right">(Huddleston and Pullum 2002, 183)</div>

To conclude the features of permission meaning in short, it occurs with rules or regulations, simple aspect, animate subjects and active voice, and it sometimes represents the gradient of restriction if undecidable.

3. Scientific Style

3.1. Function and Typical Features of Scientific Texts

Firstly, the principal function of this style is to inform, not to entertain. Thus, the message should be rather "simple and clear" for the addressee (Day 1995, 4-5). Day also highlights the essential "simplicity" of the expression that uses concrete and specific words for the sake of clarity. Secondly, it is organization of writing that represents the other aspect. The type of organization in question can be named by the acronym IMRAD, which involves Introduction, Methods, Results, and Discussion. According to Day (1995, 5), all scientific papers should be structured based on this approach. He also refers to the school of Strunk and White who adopt the same approach in stylistics (1995, 2). Although, scientific style is used through the medium of spoken as well as written communication, Day (1995) presents also a distinction in terms of its specific audience. In fact, there are scientific texts intended for scientists of the particular field of study, and then there are science (or popular scientific) texts which have their audience in lay persons, non-scientists. Primarily, the basic difference between scientific and popular scientific style is diverse, but it is commonly in the subject matter being analyzed and in the field of science, as in the field of social sciences there might be a lower degree of objectivity of

the text than in the field of natural sciences (Urbanová 2002, 48). In addition, popular science can be regarded as a "written informal scientific textbook monologue" (Crystal 1969, 89). However, this paper will further concentrate on the written formal scientific medium, scientific texts only, i.e. the language of scientific academic prose as Biber et al. (1999) refer to in their study.

Nevertheless, there are three basic purposes of scientific writing: firstly, "to record (the archival function)", secondly, "to inform peers", and thirdly, "to educate the next generation of scientists" (Day 1995, 3). As a matter of style, scientific language should be logically cohesive and coherent in its discourse by means of a specific structure of the message, i.e. for instance, using exemplification, interpretation, graphic representation, statistics, etc. To a significant extent, scientific texts contain a "matter-of-factness" in order to present information as objectively as possible. This can be demonstrated especially in the style of exact sciences and in popular scientific style which avails non-scientist lay audience with scientific information at a certain level.

As for the scientific terminology, it has been mostly adopted from Latin and Greek, so that it can be difficult for the lay persons or even for the addressees to comprehend the exact meaning (Urbanová 2002, 49). Scientific vocabulary in general is known for its typically high degree of formality and a high level of abstraction (Urbanová 2002, 64). The below-mentioned examples from (64) to (66) imply that scientific style avoids active voice and the agent of the main verb (Day 1995, 35-36). Passive can mainly attribute prominence to an object (instead of the subject) within a clause (Crystal 2003, 373). Each sentence can show that nominalization is very frequent as opposed to agentivity included in their paraphrases.

(64)   An investigation was undertaken to determine the possible effect of A on B.
        (= I studied the effect of A on B.)
(65)   The rejection of that theory has been reported.
        (= We rejected that theory.)
(66)   *The installation* of the new computer *can be performed* in 3 days.
        (= *We* can *install* the computer in 3 days.)

(Day 1995, 35-36)

Regarding negation, it is double negation that is commonly used and may be confusing for the reader, i.e. *not infrequently* and *hardly uncontroversial*. Such utterances does not always contribute to clear comprehension of the text (Day 1995, 17). In scientific writing, there are two

commonly used tenses, i.e. the present and past ones; on occasion, future tense occurs, as opposed to the perfect aspect that occurs in scientific texts only rarely (Day 1995, 74). Of all word classes, adverbs act as a device modifying the verb of the sentence, adjectives and other adverbs. Some of them, especially *only*, *often*, and *never* are commonly misplaced in scientific texts, leaving the intended meaning of a sentence unclear or its interpretation might become ambiguous. That can be fixed by using the correct word order for clarification of the agent, the action or state, and any modifiers that may occur to specify the agent and action/state (Day 1995, 39). On the other hand, such intensifying adverbs like *very* and *rather* are completely absent in this style (Crystal 1969, 206) in order to avoid vagueness of communicated information. Apart from using abbreviations, numerals, special symbols, etc., the texts indicate high lexical density and only a minimum of grammatical expressions. Otherwise, most of the authors use impersonal style in their writing, or on occasion, an author can use *we* as a subject in order to refer to the author himself; even so, the vocabulary of scientific language is usually subject-neutral. The noun phrases tend to be complex as in (67) (Crystal 2003, 372; and Crystal 1969, 55).

(67)   Correct repositioning of the head was obtained using *a transparent removable alignment grid for drawing external landmarks on the skin*.

(Crystal 2003, 372)

When it comes to the multiple types of scientific texts, Crystal asserts that "there would be linguistic differences of modality (…) in its written form (…), within the province of scientific English, if one chose to write up a topic in the form of a lecture, report, essay, monograph, or textbook" (Crystal 1969, 74-75). For this paper there is a corpus of four monographs and one textbook written by two authors to be analyzed.

3.2. Modal Verb CAN in Scientific Texts

With regards to *can* and its senses again, Biber et al. (1999, 497) conclude that *can* in academic writing is frequently used with passive voice, which should indicate logical possibility as in (68) below.

(68)   A virus air filter has been developed which *can* be fitted by the exhaust outlet.

(Biber et al. 1999, 497)

In academic prose, the indeterminacy of meanings of the verb *can* is supported by Biber et al. (1999, 492), as possibility meaning can be misinterpreted both as ability or permission meaning,

and vice versa (as in (69) and (70)). *Can* in its permission sense in academic texts is found very rarely (Biber et al. 1999, 491).

(69)　　　These observations *can* be explained biochemically.　　　(possibility/ability)

(70)　　　Only legislation *can* establish tax rates.　　　(possibility/permission/ability)

However, *can* has also its typical function as a hedging device in scientific texts. Although the author of these texts usually struggle to make an objective conclusion or denote a scientific fact in an objective way, he also encodes his opinion in the proposition by hedging the proposed data and information. Basically, hedging expressions imply "that the writer is less than fully committed to the certainty of the referential information given", which directly concerns epistemic use of modal verbs (Hyland 1994, 239-240). Apart from various lexical and other devices, hedging function is primarily conveyed by use of modal verbs, especially *may*, *might* and *could*. Thus, hedging devices can "strengthen the effectiveness and credibility of argumentation" in order to convince the peers of the author. (Hyland 1994, 240-241) *Can* is also ranged among the most frequently used modals for hedging, however, there might be a fuzzy boundary between deontic and epistemic meaning of *can*, i.e. between suggesting a commitment and certainty or necessity (Hyland 1994, 243).

To sum up in brief, scientific style is based on objectivity of the proposed data and correctly evaluated and presented results of an investigation. This can be achieved by means of hedging, which involves the degree of the author's commitment to the scientific "truth" revealed in the text. *Can* widely occurs in such uses, and furthermore, it commonly combines with the agentless passive structure, nominalization, complex noun phrases, or impersonal style of writing. The following chapter will describe the modal verb *can* in use, so that the analysis can provide a more practical insight into the subject matter.

4. Analysis

Concerning the analytical part of this paper, the analysis of the modal verb *can* will be managed in this last chapter by means of five scientific books as source material. The field of the selected books can be generally labeled as linguistics. Naturally, all the discussed senses of *can* will be demonstrated and evaluated via qualitative and quantitative analysis of the tokens based on the theoretical background that has just been formed.

As for the chosen method, there is a corpus consisting of 150 tokens of *can* in total, i.e. 30 tokens extracted from each book to achieve the desired amount for research. The results will be

presented in final numbers as well as in percentages. The tokens will be classified in terms of the typical meanings of *can* and their interpretation will be supported by the most common features mentioned in the previous chapters. Each token is presented in a broader context, at least the whole sentence is stated. In Appendix 1 the sentences are marked by a number of the token (1-150) and the letter of the particular book (A-E), however, some sentences may include more than one token; only the highlighted ones will be analyzed. Then, the findings will be concluded according to the frequency of the tokens in the individual meanings and modalities, and they will be linked to the qualitative findings as well. To comprehend the labels in the corpus itself, the occurrences with passive voice are underlined and those with animate subjects are in bold italics to differentiate it from the verb *can* in bold only; this is to visually highlight the frequency of these features at a glance.

4.1. Meanings of CAN

Above all, it should be pointed out that any categorization of a particular occurrence is not to be taken as an absolute one, as the meaning is assigned based on the most evident characteristics and criteria described before. Eventually, there will definitely be space for discussion of the undecidable borderline cases as well, especially the gradients of inherency and restriction will be involved in this category, as these can be interpreted in either way or another depending on the reader's point of view. As has been already explained, the meaning of *can* should be treated in terms of scale.

Generally, possibility is supposed to be the most frequent meaning of all, because mostly it is not restricted by the features in context (e.g. animate/inanimate subject, active/passive voice, etc.), unlike the other two meanings, i.e. ability and permission. Nevertheless, the individual senses will be illustrated on examples from the corpus and the final results will be concluded.

Now, in order to briefly comment on the overall quantitative results of the analysis, in Appendix 2, there are several tables that show the exact findings; Table 1 denotes the frequency of *can* in the individual meanings, and Table 2 denotes the frequency of *can* in a particular modality. According to the discussed features, the tokens have been divided into 5 categories as stated in Table 1, i.e. possibility, ability, and gradients of inherency and restriction (no permission sense has been recognized in the corpus), as can be referred below.

Tab. 1

CAN meaning	POSSIBILITY	ABILITY	PERMISSION	GRADIENT OF INHERENCY	GRADIENT OF RESTRICTION
Frequency	113	20	0	15	2
%	75.3	13.3	0	10	1.3

As has been already noted, possibility reading of *can* eventually prevails over the other two and also over the borderline cases formed by both gradients. In fact, possibility sense occurs in 113 cases, i.e. 75.3%, and it thus forms more than three quarters of the whole corpus. Table 2 indicates the occurrences of *can* in the modality kinds, i.e. deontic, epistemic, and dynamic. The very last column labeled as indeterminate category involves the gradient of inherency only, as the other gradient is certain to be of deontic kind, even though indeterminate in meaning. That signals a frequent occurrence of the deontic possibility, as no case of epistemic possibility has been found at all. Deontic modality has been found with 115 cases, i.e. 77%. Since clear permission meaning is completely missing, the vast majority of deontic tokens can be assigned to possibility meaning.

Tab. 2

CAN modality	DEONTIC	EPISTEMIC	DYNAMIC	INDETERMINATE
Frequency	115	0	20	15
%	77	0	13	10

As for dynamic modality, it can be directly linked to ability meaning, i.e. 20 cases representing 13.3% of all cases. This confirms that ability is more common than permission and less common than possibility. Actually, it is the gradient of inherency that cannot be clearly determined to be possibility (deontic modality) or ability (dynamic modality). This category comprises of 15 cases representing 10% of all tokens, which is rather a minority with regards to the other categories. The occurrence of the selected features will be reflected in the following subchapters assigned to the individual meanings.

Last but not least, there is Table 3 that reveals the occurrences of affirmative and non-affirmative forms of *can*, and at the same time the occurrence of *can* in interrogative sentence

structure. Especially non-affirmative forms will be dealt with in the following subchapter analyzing possibility meaning. In general, most of the tokens (91%) occurred with the affirmative form of *can*, while only a fragment (8%) has occurred with the non-affirmative form *cannot*. Only one case (1%) of affirmative *can* has been used in interrogative sentence structure, which can be referred to in Table 3 below.

Tab. 3

CAN forms/structure	AFFIRMATIVE	NON-AFFIRMATIVE	INTERROGATIVE
Frequency	137	12	1
%	91	8	1

The remaining tables (Table 4 and Table 5) are to be commented on in the subchapters devoted to the individual meanings and can be found in Appendix 2 as well.

4.1.1. CAN – Possibility

Regarding possibility meaning, 113 cases have been identified as representing this sense of *can* which is actually 75.3% of all. This confirms Leech's (2004) statement that possibility meaning is the most common one. In fact, possibility meaning of *can* has been recognized with 105 affirmative forms (93%), 7 non-affirmative forms (6%) and in 1 interrogative sentence structure (1%). All possibility cases have been identified with deontic modality, as neither of them expressed epistemic nor dynamic kind of modality.

As the modal verb *can* expresses merely deontic modality in its possibility reading, epistemic modality has not been found at all. In other words, neither of the non-affirmative forms of *can* conveyed the speaker's confidence or certainty about the likelihood of the action or event to happen. However, the non-affirmative occurrences have been paraphrased in terms of deontic possibility as can be best supported by the following examples and their paraphrases:

(1) Again, we *cannot* really describe the nose and the nasal cavity as articulators in the same sense as (i) to (vii) above. (108D) (= *It is not possible for us to describe* etc.)

(2) If we say that the difference between vowels and consonants is a difference in the way that they are produced, there will inevitably be some cases of uncertainty or disagreement; this is a problem that *cannot* be avoided. (109D) (= *The problem is not possible to be avoided./There is no possibility to avoid the problem.*)

Another non-affirmative forms of *can* may reflect an obstruction to the possibility of the action or event, as exemplified below, and actually, some disabling circumstances can be found in the same sentence, as underlined in the example below:

(3) The soft palate or velum is seen in the diagram in a position that allows air to pass through the nose and through the mouth. Yours is probably in that position now, <u>but often in speech it is raised</u> so that air *cannot* escape through the nose. (101D)

As has been explained before, *can* commonly expresses logical possibility so that *cannot* in the following example concludes that the action or event is not feasible or conceivable. So to speak, the situation in question is logically impossible.

(4) In words such as *receive*, *reduce* and *repeat*, we can identify the bound morpheme *re-* at the beginning, but the elements *-ceive*, *-duce* and *-peat* are not separate word forms and hence *cannot* be free morphemes. (149E)

As for the interrogative structure, this only example of possibility reading can be even strengthened by adding the adverb *possibly* without changing the meaning, as paraphrased below:

(5) Consider English words beginning with the sound h; what sounds *can* come next after this h? (= *What sounds can possibly come next after this h?*) (110D)

Although possibility occurs prototypically with inanimate subjects and passive voice, this rule cannot be regarded as an absolutely valid one. Possibility of *can* may even occur with an inanimate subject and active voice, or with animate subject and active voice (e.g. widely used with a general subject *we* having an agentive function), which are the prototypical features of ability and permission. Nevertheless, in this context and especially in academic discourse, a general animate subject can combine with active voice in order to hedge the statement so to enhance and support the speaker's assumption or suggestion about his findings, and also it confirms the assumption about the use of impersonal writing style when hedging information (Hyland 1994). The below utterances may serve as the examples of *can* functioning as a hedging device:

(6) <u>We *can* also point to</u> the difference in degree of deviance between 4 and 5, which is out of all proportion to any difference of meaning between complete and finish. (5A)

(7) The term 'text' refers to any instance of language, in any medium, that makes sense to someone who knows the language; we *can* characterize text as language functioning in context (cf. Halliday & Hasan, 1976: Ch. 1; Halliday, 2010). (31B)

(8) There is a form of order here that we *can* call constituency, whereby larger units are made up out of smaller ones: a line out of feet, a foot out of syllables, a syllable out of sequences of phonemes (perhaps with 'sub-syllable' intermediate between the two). (37B)

Moreover, *can* in its rational subcase of possibility, e.g. similarly as in (6), (7), or (8), often uses an animate general subject or a subject which the speaker identifies himself with. Such explanation reflects even better the assertion about hedging. In the analysis, it is the general first-person subject *we* that occurred with active voice in the vast majority. Nonetheless, another general subjects have been identified with active voice, e.g. *one, you*, or *a person*, as exemplified below. These subjects can be considered the factors of circumstantial subcase of possibility, for instance, the example sentences (9) and (10) highlight their enabling circumstances as underlined. In (11) there is an example of the general subject *you*. Here the author refers to the audience as *you*, not reporting to a concrete *you*.

(9) Moreover, the notion of corrigibility is itself suspect: strictly speaking, one *can* only correct an utterance when one knows what the speaker intended to say, and this is not the case with the specially constructed sentences used in semantic analysis. (8A)

(10) Fourthly, through ellipsis a person *can* omit entirely repeated mention of those elements which he/she considers to be recoverable from an earlier part of the discourse. (76C)

(11) You probably want to know what the purpose of this course is, and what you *can* expect to learn from it. (91D)

Such uses of general subjects with active voice have been identified in 27 possibility cases, which forms almost a quarter of all possibility tokens (i.e., 24%).

To comment on the findings, animate subjects have been found with active voice only, whereas inanimate subjects have been rarely found with active voice in comparison with their occurrence with passive voice. As a matter of fact, an inanimate subject co-occurred with passive voice in 61 cases of 82, which equals to 74%. In addition, passive voice has been used more frequently than active voice (in 54%) regardless of the subject kind. This can support the assumption that agentivity is commonly avoided in scientific style (as mentioned in the

subchapter 3.1.). Similarly, inanimate subjects form 73% of the cases expressing possibility, which represents almost a three-quarter proportion of all possibility tokens. As a result, it has been proved that an inanimate subject and passive voice are the main characteristics of possibility meaning of *can*. These numbers can be supported by the details included in Table 4 below.

Tab. 4

CAN possibility	INANIMATE SUBJECT	ANIMATE SUBJECT	ACTIVE VOICE	PASSIVE VOICE
Frequency	82	31	52	61
%	73	27	46	54
ACTIVE VOICE	21	31	-	-
PASSIVE VOICE	61	0	-	-

Basically, *can* has been used with passive voice to avoid the agent, as it is not important to be mentioned for many different reasons. By means of passive, the subject of a clause lacks the agentive function so that it can be often of inanimate nature and it also acts as a feature co-occurring with the statements hedged by the modal verb *can*. Such cases are the most typical for scientific writing when it comes to possibility interpretation. That can be demonstrated in (12) and (13) along with their active-voice paraphrases in the brackets.

> (12)   But in attempting to decide whether the deviance in either case is grammatical or semantic, we are not wholly dependent on unaided intuition: reasoned arguments *can* be deployed. (= *We can deploy reasoned arguments.*) (3A)
>
> (13)   A more promising strategy is to ask not how or whether a deviant sentence *can* be corrected, but what the minimal changes are that will render it normal; then we examine the nature of the changes. (= *A more promising strategy is to ask not how or whether we can correct a deviant sentence, (...).*) (9A)

In the other case, the author may want to mention the agent by means of a by-phrase, which forms long passive. By-phrases are usually located at the end of the sentences, representing a process of nominalization. After all, nominalization is one of the typical characteristics of scientific texts, and by adding information on the agent in the form of a by-phrase, the text can be much more specific about the action or event in question. It also contributes to a higher

lexical density of the particular text. The main purpose of using a by-phrase and placing it at the end of a sentence is to mention or even highlight the agent of an event. Strictly speaking, if long passive is used, the agent becomes relevant for the whole proposition in order to specify and even extend the statement by additional information; several examples can be found underlined in (14), (15), or (16) below. To briefly interpret their meaning, the example (16) examines the only two possibilities or options to change the tongue height, whereas in (14), there is a list of multiple possibilities or ways of normalization. And lastly in (15), the action or event is merely possible by reference to a non-deviant sentence, indicating that there is no other possibility.

(14)　If a deviant sentence *can* be normalised <u>by adjusting its grammatical structure</u> - for instance, <u>by changing the order or syntactic category of elements</u>, or <u>by adding, substituting or deleting one or more grammatical elements</u> - then it would seem reasonable to suppose that its deviance is grammatical in nature. (10A)

(15)　A syntactically deviant sentence *can* be interpreted only <u>by reference to a non-deviant sentence</u>: a speaker, in other words, is not free to create his own grammar. (24A)

(16)　Tongue height *can* be changed <u>by moving the tongue up or down</u>, or <u>moving the lower jaw up or down</u>. (114D)

As to mention the precise findings, long passive has been found with mere 8 cases of 61 passives (i.e. 13%), so that short passive is still more frequently used (87%) probably due to its focus on the most important information of the whole message.

Regarding active voice combined with an inanimate subject, this has been found the least frequent usage of the modal verb *can* in possibility sense. Since there were 61 cases of 82 with inanimate subjects and passive voice, only remaining 21 cases, i.e. 26%, have used an inanimate subject with active voice. However, these cases have been very rarely used and the modal verb can expresses mere possibility that *the sentence can be accommodated* as in (17), or existential possibility that *Many of these new words have sometimes a very brief life-span.* as in (18).

(17)　 A purely syntactically ill-formed sentence, on the other hand, is irredeemably deviant, and the only contexts which *can* accommodate it are those which induce a tolerance for grammatical incompetence or, at any rate, nonconformity. (21A)

(18)　Many of these new words *can*, of course, have a very brief life-span. (141E)

In order to complete this subchapter, *can* mostly occurred in similar cases to (19), which prototypically contains an inanimate subject and the verb phrase in passive voice.

> (19)   Put another way, we find that words *can* be grouped together to form larger units. (86C)

However, it can be confirmed that such instances suggest the speaker's assumption about the likelihood of the subject to perform the action. This can only support the assertion that the verb *can* is commonly used as a hedging device to introduce the speaker's scientific suggestion or findings.

4.1.2. CAN – Ability

To begin with, dynamic modality should be related to the only meaning of *can*, i.e. ability, or in other words, subject-oriented subcase of dynamic modality. Since the number of tokens with ability meaning corresponds exactly with the number of dynamic modality occurrences (as stated in Table 1 and 2, i.e. 20 cases representing 13.3% of all 150 tokens), the process of meaning interpretation has been much more clear-cut and straightforward than identification of possibility cases. In order to most reliably recognize ability meaning of *can*, paraphrases have been used, i.e. *be capable of doing* or *know how to do* something. In (20) and (21) both types of paraphrases are used.

> (20)   We *can*, of course, behave without resorting to the use of language: for example, we can play the piano, mow the lawn or cook the dinner. (67C) (= *We are, of course, capable of behaving (…)*)
>
> (21)   We can, of course, behave without resorting to the use of language: for example, we *can* play the piano, mow the lawn or cook the dinner. (68C) (= *(…) we know how to play the piano, mow the lawn or cook the dinner.*)

As for the non-affirmative form of *can*, these have been found in 2 cases only, having an animate and inanimate subject, however, combined with active voice. The example (22) can be interpreted in a way similar to *we are not able to explain* or rather *we are not capable of explaining*. Likewise, an inanimate subject in (23), i.e. forms, clearly lacks the ability to perform the action, so that it can be read as *forms that are not able to stand/capable of standing alone*. All in all, these non-affirmative uses do not express any kind of possibility, as the readings are based on a lack of ability or absence of the qualities required to perform the action.

(22)   These two perspectives are clearly complementary: we *cannot* explain why a text means what it does, with all the various readings and values that may be given to it, except by relating it to the linguistic system as a whole. (33B)

(23)   There are also bound morphemes, which are those forms that *cannot* normally stand alone and are typically attached to another form, exemplified as *re-*, *-ist*, *-ed*, *-s*. (145E)

As already mentioned in the subchapter 2.2.1.2., inanimate subjects are not typical to ability meaning of *can*, but sometimes it may occur in the sense that the subject has the necessary qualities or power to cause the event to take place, and therefore, *can* refers to the inherent properties of the subject. A lack of these properties can be seen in (23), and conversely, the utterance in (24) shows that the subject possesses some qualities or inherent properties. In fact, the use in (25) shows that the property of being elastic allows the syllable to accommodate itself, then the syllable is able to accommodate itself.

(24)   There are freemorphemes, that is, morphemes that *can* stand by themselves as single words, for example, *open* and *tour*. (144E)

(25)   The syllable is 'elastic' so that it *can* accommodate itself to the rhythmic requirements of the foot. (46B)

Regarding the actual findings stated in Table 5 below, ability has been identified with active voice only, i.e. in 20 cases of 20, which reflects the theory that *can* occurs exclusively with active voice in order to convey ability meaning. Secondly, an inanimate subject has been found in 5 cases of 20, i.e. 25%, which has just been marked as not entirely characteristic of ability meaning. Lastly, it is an animate subject that has been identified with 15 cases of 20, i.e. 75%. In such cases the animate subject has also agentive function, as it occurs with active voice so that the agent is always known. This can be found in (26) listed below Table 5; it also uses a general subject *you*, however, the paraphrased expression could be *to see if you are able to identify/capable of identifying*.

Tab. 5

CAN ability	INANIMATE SUBJECT	ANIMATE SUBJECT	ACTIVE VOICE	PASSIVE VOICE
Frequency	5	15	20	0
%	25	75	100	0

(26)   If you are a learner of English you are recommended to concentrate on BBC
pronunciation initially, though as you work through the course and become familiar
with this you will probably find it an interesting exercise to listen analytically to
other accents of English, to see if you *can* identify the ways in which they differ
from BBC and even to learn to pronounce some different accents yourself. (95D)

Furthermore, the general subject *we* can be used as an animate subject to indicate ability
meaning of *can*, for instance, in (27) there are inherent properties as underlined, which *enable
us to produce utterances*. So to speak, *owing to the creative potential of language, we are able
to produce utterances*.

(27)   On the contrary, owing to the creative potential of language, we *can* produce
utterances which we have never heard before and, likewise, can understand
sentences which we may not have come across previously, e.g. / will check the speed
of these spiders with John's digital watch. (83C)

As has been noted before, 8 tokens of the modal verb *can* have been found with the verbs of
inert cognition or perception, which represents 40% of all ability interpretations. As for the
verbs of inert cognition, 4 tokens have been identified, i.e. 2 cases with the verb *recognize* and
2 cases with *understand*. The example sentence in (28) demonstrates ability reading with the
verb *recognize* as *we are able perhaps to recognize*, and in (29) the main verb used is
understand which can be paraphrased as *we are able very quickly to understand*; in both cases
there is hardly any change in meaning between being able to do it and actually doing it, i.e. *we
can recognize/we recognize* and *we can understand/we understand*. What even supports ability
meaning in (29) is the underlined word *ability* stated in the following sentence, referring to the
proposition in the previous sentence.

(28)   These moments of prominence define a snatch of melody – a melodic unit, or
line; and within this melodic progression we will be able to pick up a more or less
regular beat, defining some rhythmic unit, or foot. We *can* perhaps recognize that
the 'line' and the 'foot' of our traditional verse metres are simply regularized
versions of these properties of ordinary speech. (34B)

(29)   That is, we *can* very quickly understand a new word in our language (a
neologism) and accept the use of different forms of that new word. This ability must
derive in part from the fact that there is a lot of regularity in the word-formation
processes in a language. (126E)

Similarly, also 4 tokens including the verbs of inert perception have been found. In 2 cases there was the verb *hear*, and then the verbs *feel* and *see* have been mentioned each in 1 case. In order to interpret the examples of each verb below, all of them retain the general animate subject *we* or *you*. Basically, if the modal verb *can* combines with a verb of inert perception, *can* denotes a rather instantaneous state than a potential event, which is special to ability meaning of *can*. Thus, Leech's (2004) proposition about this group of verbs has been confirmed. Though, this meaning is not so widely used within the analyzed style as possibility meaning is. Its use in scientific style is more or less restricted to the contexts as active voice and inanimate subject, or combination with the above-mentioned groups of verbs.

(30)   Listening to the four lines of the apple-pie rhyme we *can* hear that they make up a sequence of interrelated tone groups: beginning with a series that are alike, all ending on a rise, and ending with one that is distinct, with its final falling movement on drink. (52B)

(31)   The hard palate is often called the "roof of the mouth". You *can* feel its smooth curved surface with your tongue. (103D)

(32)   Looking more closely at the preceding group of words, we *can* see that some affixes have to be added to the beginning of the word (e.g. *un-*, *mis-*). (137E)

In conclusion to this part, ability meaning is mostly regarded as the basic meaning of the verb *can*. Due to this fact, ability is much more apparent than the other two meanings of *can*. Lastly, there have been identified several undecidable cases balancing between ability and possibility; these can be referred to in the subchapter 4.1.4.1., Gradient of Inherency.

4.1.3.   CAN – Permission

Unfortunately, no clear occurrence of permission has been recognized in the analysis. It might be due to the written medium and the register with a high degree of formality, which are the attributes of the selected corpus. As a matter of fact, *can* in its permission meaning occurs more frequently in spoken language with a lower degree of formality. In other words, this kind of meaning can be determined more clearly and frequently in case the corpus is of a larger scale and/or the source material is designed rather for spoken presentation, e.g. lectures. The only possible permission sense that could occur in scientific texts is objective permission meaning concerning rules and regulations. However, no clear example of permission meaning has been recognized in the corpus, which is rather a small-scale one, though, extracted from five different

sources. Only 2 cases of the gradient of restriction have been recognized, which will be discussed more in detail in the next subchapter (especially in the part 4.1.4.2.).

4.1.4. CAN – Borderline Cases

4.1.4.1. Gradient of Inherency

Firstly, there are 15 borderline cases marked as the gradients of inherency. This number represents 10% of the whole corpus, as indicated in Table 1. Strictly speaking, the features applied to the previous categories cannot be always used as a reliable and absolute method to define the meaning. In such cases the interpreter cannot decide whether the subject is able to perform the action (i.e. ability sense) or the statement conveys mere possibility regardless of the abilities of the subject (i.e. possibility sense), as can be shown in (33). It is not certain whether *we are now able to formulate* due to our ability acquired before, or *now it is possible for us to formulate*, expressing mere possibility of the event to happen and indicating that now there is no obstruction to the action or event.

> (33)   We *can* now formulate a provisional test to determine whether a deviance is grammatical or semantic ('provisional', because, as we shall see, things are not so simple): if the minimal change required to 'cure' an anomaly in a sentence involves one or more closed set items, then the deviance is grammatical; if, however, the sentence can most easily be normalised by replacing one or more open set elements, then the deviance is semantic. (11A)

According to what has been already defined, the cases with an animate subject and active voice are more likely to be read as ability. The above-mentioned example (33) fulfills both conditions as well as the other 7 occurrences do (there are 8 cases with an animate subject and active voice in total). However, some cases have these features but at the same time there are enabling circumstances typical for possibility, as exemplified in (34) and (35) where the circumstances have been underlined. These parts of the statements can determine possibility nature of the particular use of *can*. In addition, the verb phrase in (35) contains a verb of inert perception, i.e. *see*, which signals ability meaning, and thus confuses the final interpretation.

> (34)   <u>If, by contextual manipulation, we can reduce the apparent oddness, or at least cause it to be perceived as communicatively appropriate</u>, then we *can* take it that we are dealing with a semantic deviance (although the involvement of grammatical elements cannot be ruled out).[7] (19A)

(35)   If you look in your mirror with your mouth open, you *can* see the back of the

pharynx. (100D)

The remaining 7 of 15 cases have occurred with an inanimate subject. Moreover, 3 occurrences of them have been found with passive voice, which does not typically determine ability meaning. Nevertheless, these cases (as shown in (36) and (37)) can be seen as indeterminate because they are related to the abilities of the human articulators, and thus can be interpreted as e.g. *the tongue is able to touch the soft palate*, *the human mouth is capable of opening and closing* or *the tongue is capable of shaping*. These can be even easily transformed from passive to active, e.g. *the human mouth can open and close*, or *a tongue can shape*. Despite these suggestions, possibility meaning factors prevail over those of ability meaning.

(36)   The other important thing about the soft palate is that it is one of the articulators

that *can* be touched by the tongue. (102D)

(37)   The human mouth is relatively small compared to other primates, *can* be opened

and closed rapidly, and contains a smaller, thicker and more muscular tongue which

can be used to shape a wide variety of sounds inside the oral cavity. (124E, 125E)

Last but not least, the other 4 cases having inanimate subject are linked with active voice, which may express ability including the inherent properties, or they may convey mere possibility of the action to happen, as described in (38) below.

(38)   Now think of English words beginning with the two sounds bɪ; we find many

cases where a consonant *can* follow (e.g. d in the word 'bid', or l in the word 'bill'),

but practically no cases where a vowel may follow. (111D)

4.1.4.2. Gradient of Restriction

To briefly comment on this gradient, it is assigned to the borderline cases indeterminate between possibility and permission. Therefore, the interpretations can be either *to be allowed/permitted to do something* or *something is possible to happen*. In the corpus, only 2 cases of the gradient of restriction have been found, representing a mere 1.3% of all tokens. The example (39) has an animate subject and active voice, which is typical of permission, and it can be regarded as a rule, i.e. objective permission, but on the other hand, it may be even paraphrased as *it is possible for us to create*. The second example can possibly convey permission as *these examples allow us to see*, or it can be simply paraphrased as *it is possible*

for us to see. Moreover, if the interpreter considered *see* the decisive factor (a verb of inert perception), also ability meaning would be involved as well.

(39)   The assumption seems to have been that if there is a noun ending in *-er* (or something close in sound), then we *can* create a verb for what that noun *-er* does. (132E)

(40)   From these examples, we *can* see that there is a regular pattern whereby the infix *–rnis* added to verbs to form corresponding nouns. (139E)

All in all, this gradient is more likely to be rare in scientific texts, as permission does not directly correspond to the particular style. However, permission is considered a type of possibility as well as ability is, so that both gradients can occur at times.

4.2. Summary of Results

Primarily, this subchapter is devoted to the summary of the findings reported on in the Analysis. To sum up, the most frequent modality of *can* can be classified as deontic. As to report on the concrete numbers, deontic modality has been found with 115 tokens, i.e. 77%. Although no permission meaning has been clearly identified, only deontic possibility meaning has been defined in the vast majority throughout the corpus, i.e. 113 cases of possibility and 2 gradients of restriction balancing between deontic possibility and deontic permission.

Regarding epistemic modality, only possibility could be expected to occur with the modal verb *can* in its non-affirmative form (*cannot* occurred in 12 cases, i.e. 8% of all). However, none of the non-affirmative tokens expressed epistemic possibility; in 7 cases *can* conveyed deontic impossibility, i.e. 58% of 12 tokens, in 2 cases it conveyed dynamic inability, i.e. 17%, and the remaining 3 cases (25%) are indeterminate within both modality and meaning, i.e. they belong to the gradient of inherency. This implies that *can* in its non-affirmative form has occurred mainly with deontic possibility meaning. Nevertheless, the negative form represents only 6% of possibility interpretations and 8% of all tokens of *can*, which is a rather insignificant and minor feature.

The second most frequent modality has been identified as dynamic, which directly implies ability interpretation of *can*. Dynamic modality has been found with 20 tokens, i.e. 13.3%, and exactly the same numbers can be applied to ability meaning as well.

As a matter of fact, the only two clear-cut meanings have been identified, i.e. deontic possibility and dynamic ability. Strictly speaking, most of the cases have been explained by means of

paraphrases to indicate a particular meaning. Secondly, the distinctions between animate and inanimate subject, and between passive and active voice have been made. In case the features signaled either one or another meaning, the relevant gradient has been assigned to the token. As for the cases expressing possibility, the most frequently applied paraphrase was *It is possible for someone/something to do something*. In some cases, external circumstances have been identified to clearly assign the token to possibility meaning. Also the adverb *possibly* has been applied when identifying possibility meaning of the only token occurring in question form, i.e. interrogative sentence structure, which represents 1% of all tokens. Then inanimate subject has been linked to passive voice as the most common combination, i.e. in 74% of all possibility cases. Passive voice has been used more frequently than active voice, i.e. 54% versus 46%, long passives with by-phrases have been identified with mere 8 cases (13%) of all 61 passive cases. Additionally, the passive structure can hedge the proposition as well, because the agent is missing and it mostly contains inanimate subject. Thus, possibility meaning can occur with any combination of such features, even though some combinations are much more typical for the particular interpretation than the other ones.

Regarding ability meaning, there are much more straightforward results, and the identification of ability has been made by means of the paraphrases *to be able/capable to do/of doing something* or *to know how to do something*. This kind of meaning is marked by the exclusive use of active voice and predominantly by the use of animate subject. Inanimate subjects have occurred only in a quarter of all ability interpretations, i.e. 25%. As has been noted, ability is also linked with the positive form of *can*, as the form *cannot* has been found with mere 2 cases of 20, i.e. 10%. Additionally, it has been found that in 40% of all ability cases contained a verb of inert perception or cognition, and thus it supported the Leech's (2004) theory again.

Basically, there are 17 tokens of *can* that cannot be decided based on the features mentioned above, i.e. 11.3%, as the features are in conflict or the context does not strictly specify either one or another meaning. These cases are explained in terms of the gradient of inherency, i.e. 15 cases of 150 representing 10%, and the gradient of restriction, i.e. 2 cases of 150 representing 1.3%. The cases of both gradients have been contrasted within the relevant meanings, their features and possible interpretations.

5. Conclusion

To conclude the findings, the modal verb *can* has been used mostly in deontic modality (77%) expressing possibility (75.3%). Possibility can be identified with all combinations of the

discussed features and also the subcases of possibility can be found, e.g. existential or circumstantial one. However, the most frequent possibility occurrences have been recognized with an inanimate subject (73%) and passive voice (54%), and predominantly in combination of these two factors, an inanimate subject combined with passive voice (74%). In scientific style passive voice is commonly preferred in order to avoid the agent of the verb phrase, assigning significance to an object rather than the subject of the clause.

As for the other combinations of contextual factors, an animate subject has been used (27%) merely with active voice. Active voice also has occurred less frequently (46%) than passive voice. On the other hand, an inanimate subject has been found much less often with active voice (26%) than with passive voice (already mentioned 74%).

Regarding short agentless passives, they prevail (87%) over the uses of long passive (13%) marked by a by-phrase, which implies that the agent is usually not important or relevant in scientific texts, thus, it is not mentioned. Nevertheless, sometimes the by-phrase may be used to specify the message of the utterance or to list all possibilities for the action to happen. Regarding scientific texts, the by-phrase can be added to provide information on the agent of the action if relevant. Passive voice also confirms the statement about a higher lexical density of the scientific texts.

Moreover, *can* in its possibility sense can be regarded as a hedging device used to promote the speaker's suggestion about the findings and to make his assumption as much objective as possible for the audience. It might be the reason why possibility interpretation and hedging use of *can* are found to be prototypical for this modal verb in the analyzed style.

To comment on ability meaning, the analysis has also confirmed that *can* expresses ability exclusively with active voice. In the corpus, it mainly co-occurred with animate subjects (75%) but it also combined with inanimate ones, forming a quarter of all ability readings (25%). The latter combination imply that the particular utterance involves certain inherent properties of the inanimate subject, which enable it to perform the action. Similarly as in possibility cases, the affirmative form of *can* has been used much more often (90%) than the other one (10%), represented by only 2 cases that conveyed lack of the inherent properties, and hence inability to perform the action. All in all, the scientific language tends to be rather subject-neutral, therefore, ability is not to be seen as a characteristic and the most frequent meaning of *can* in the scientific style.

Last but not least, the borderline cases represent a minor category of all (11.3%), since the gradient of inherency (10%) prevails over the gradient of restriction (1.3%). These cases cannot be strictly classified based on the contextual factors used before, because of the well-known scalability of *can*.

Concerning the non-affirmative forms of *can*, only *cannot* has been found throughout the various interpretations, as it corresponds to the high degree of formality of the analyzed texts; the contracted form *can't* is used in the texts of a rather lower degree of formality. After all, of all meanings, the affirmative form of *can* is much more frequent (92%) than the non-affirmative one (8%) regardless of the sentence structure.

To sum up, the analysis has eventually proved that clear possibility meaning is the most common (85% of all 133 clear interpretations), clear ability meaning is much less common than possibility (15%), though, it is more common than clear permission meaning that has not occurred in the analysis of this paper (0%). This confirms the assumption of Biber et al. (1999, 491) about the very rare occurrence of permission meaning of *can* in scientific academic texts.

6. Résumé

Cílem této práce je prozkoumat užití modálního slovesa *can* ve vědeckém stylu. Práce se blíže zaměřuje na výzkum užití *can* ve vědeckých textech, konkrétně v oboru lingvistika. Výzkumný vzorek byl tedy získán z textů, resp. knih zaměřených na různé obory lingvistiky, jmenovitě jde o následující tituly: Cruse, D. Alan - Lexical Semantics; Halliday, M. A. K., and Christian M. I. M. Matthiessen - Halliday's Introduction to Functional Grammar; Morley, G. David - Syntax in Functional Grammar: An Introduction to Lexicogrammar in Systemic Linguistics; Roach, Peter - English Phonetics and Phonology: A Practical Course; a nakonec Yule, George - The Study of Language. Bližší popis knih je uveden v části Odkazy (References). Výskyty byly vybrány náhodně.

Práce je rozdělena na dvě části, teoretickou a analytickou část. První teoretická část má za úkol vysvětlit pojem modalita a popsat jednotlivé druhy modality. Klasické lingvistické přístupy zahrnují modalitu dispoziční (deontic modality) a modalitu jistotní (epistemic modality). Oba základní druhy modality jsou v první kapitole popsány a rozebrány. Je zde uvedeno hned několik přístupů k terminologii modalitních druhů, přičemž je pro tuto práci nakonec vybrán pouze jeden z nich. Přestože modální sloveso *can* vyjadřuje oba zmíněné druhy, dispoziční modalita se obecně objevuje mnohem častěji než modalita jistotní. Palmer (1990) nebo Huddleston and Pullum (2002) a jiní jazykovědci rozlišují ještě třetí druh modality, modalitu

dynamickou, která hraje významnou roli při určování schopnostního významu modálního slovesa *can*.

Ve druhé kapitole se jedná o zařazení modálního slovesa *can* mezi ostatní modální slovesa. *Can* je klasifikováno v rámci skupiny hlavních modálních sloves (central modal verbs), jelikož se svými vlastnostmi a použitím ve větě odlišuje od ostatních skupin modálních sloves. Tato kapitola rovněž komentuje tvary slovesa *can* a jejich užití vzhledem k větné skladbě. Jsou zde zmíněny vlastnosti společné pro pomocná slovesa i vlastnosti odlišující modální slovesa od těch lexikálních. Dále se podstatná část této kapitoly věnuje významům slovesa *can*, tj. možnost (possibility), schopnost (ability) a povolení (permission).

Jednotlivé podkapitoly ilustrují konkrétní význam slovesa *can* na příkladech a parafrázích. Na základě odborné literatury jsou uvedeny příslušné indikátory či lépe řečeno kontextové faktory určitého významu, což může být např. životný/neživotný podmět, činný/trpný rod, kladný/záporný tvar slovesa, apod. Stejně tak jsou zde uvedeny i další faktory, které lze najít v kontextu určitého výskytu slovesa *can*, a tím snadněji a přesněji interpretovat míněný význam, tj. např. vnější okolnosti (external circumstances), přirozené či vrozené vlastnosti (inherent properties) nebo některé lexikální výrazy vyjadřující modalitu (např. possibly, sometimes) a jiné.

Třetí kapitola se zaměřuje na rozbor vybraného vědeckého stylu. Uvádí, že vědecký styl může mít mnoho podob a využití, z nichž jsou pro analýzu vybrány psané texty vědeckého stylu (scientific style) určené pro vědce z oboru, nikoli pro laickou veřejnost, tj. styl populárně-vědecký (popular scientific style). První podkapitola se postupně zabývá primárními funkcemi vědeckého stylu a jeho typickými vlastnostmi jako je např. konverze, trpný rod či převažující výskyt lexikálních slov nad gramatickými.

Hlavním bodem druhé podkapitoly je představení funkce slovesa *can* jako tzv. prostředek atenuace (hedging device), tj. nástroj pro zdůraznění či posílení autorova argumentu jako věc objektivně dokázanou. Předpokládá se, že je tato funkce typická pro vědecký styl, zvláště pokud jde o užití modálního slovesa *can*.

Druhá část práce, část analytická, se zabývá analýzou konkrétních výskytů modálního slovesa *can* ve vybraných textech, které jsou označeny velkými písmeny A až E, přičemž pořadí nalezených výskytů je seřazeno od 1 po 150. Celkem tedy práce zkoumá 150 výskytů slovesa *can*, tzn. 30 výskytů z každé zdrojové knihy, především aby byla zajištěna pestrost zdrojů pro výzkum v rámci jednoho vědeckého oboru, tj. lingvistika. Všechny výskyty jsou uvedeny na

konci práce v Příloze 1 (Appendix 1) a navíc jsou rozděleny do kategorií dle určených významů. U každého výskytu je v závorce na konci věty uveden konkrétní zdroj a strana, na které se zkoumaný výskyt slovesa nachází, např. (A,1). Pro větší optickou přehlednost některých faktorů v korpusu je výskyt trpného rodu vždy podtržený a výskyt životného podmětu je zvýrazněn tučnou kurzívou.

První podkapitola analýzy obsahuje další čtyři podkapitoly, které pojednávají o jednotlivých významech modálního slovesa *can*, tj. možnost, schopnost, povolení a nejasné případy. Tyto nerozhodnutelné případy se dále dělí dle kategorií na inherentní gradient (gradient of inherency) a restriktivní gradient (gradient of restriction). První kategorie zahrnuje případy nerozhodnutelné mezi možností a schopností, zatímco ve druhém gradientu jsou obsaženy případy kolísající mezi možností a povolením.

Vzhledem k vysoké četnosti slovesa *can* v možnostním významu je tato kategorie komentována jako první. Možnost byla spojena se 113 ze 150 výskytů, což představuje valnou většinu, tj. 75.3%. Většina možnostních výskytů se objevila s neživotným podmětem (73%) a trpným rodem (54%), obzvláště s oběma faktory zároveň (74%). Naproti tomu se neživotný podmět s činným rodem objevil pouze asi ve čtvrtině případů (26%). Pokud jde o životný podmět, ten se celkem objevil ve 27% případů a pojí se pouze s činným rodem slovesa. Tento životný podmět byl často obecným podmětem *my*, který podněcoval neosobní vědecký styl psaní a užití *can* jako prostředek atenuace. Dále bylo zjištěno, že častěji byl uveden trpný rod bez uvedení konatele děje (short passive), tj. 87%, zatímco trpný rod obsahující tzv. *by-phrase* byl nalezen pouze ve 13% případů. Z toho vyplývá, že pro vědecký text je stále významnější prostý trpný rod bez uvedení konatele. Nakonec lze usoudit, že typickými faktory možnostního významu slovesa *can* jsou neživotný podmět a trpný rod.

Četnost výskytů schopnostního významu modálního slovesa *can* (13.3%) se přímo shoduje s výskyty dynamické modality, jelikož jde o jediný uvedený dynamický význam slovesa *can*. Během analýzy bylo zjištěno, že neživotný podmět se s tímto významem pojí pouze ve 25% případů, zatímco životný podmět se objevuje ve třech čtvrtinách případů (75%). Analýza navíc potvrdila teorii, že schopnostní význam modálního slovesa *can* lze najít výhradně ve spojení s činným rodem slovesa. A tak typickými kontextovými faktory pro schopnost jsou životný podmět a činný rod. Kromě toho schopnost lze vymezit ve 40% výskytů, které užívají slovesa vnímání a poznání (verbs of inert perception and cognition).

Následuje krátká podkapitola o významu povolení. Bohužel žádný výskyt nebyl s tímto významem spojen, což může mít příčinu v relativně malém zkoumaném vzorku. Důvodem může být i zkoumaný psaný projev a vysoký stupeň formality vědeckých textů, které nejsou typickým prostředím daného významu.

Nakonec práce zmiňuje nejasné případy, které kolísají mezi možností a schopností (10%) nebo mezi možností a povolením (1.3%). Jak již bylo řečeno, významy modálního slovesa *can* jsou spíše stupňovatelné povahy, a tak se v menšině případů mohou objevit protichůdné faktory znemožňující interpretovat význam jednoznačně.

Závěrečnou částí analytické části této práce je shrnutí výsledků a jejich vyjádření v procentech. Veškerá data podstatná pro závěry z analýzy jsou poskytnuta ve formě pěti tabulek, které jsou k nalezení v Příloze 2 (Appendix 2).

V průběhu práce jsou zmíněny příklady užití slovesa *can*, přičemž zdroje jsou vždy adekvátně ocitovány. Příklady slouží ke znázornění vysvětlovaných pojmů a jevů jak v teoretické, tak i v analytické části práce. V teoretické části jsou příklady přejaty přímo z odborné literatury použité pro zpracování této části, zatímco v analytické části jsou využity konkrétní výskyty slovesa *can* z výzkumného vzorku dat. Příklady jsou tedy číslovány dle dvou seznamů.

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8. Appendices

8.1. Appendix 1: Data Corpus

CAN – possibility

1A   But there are good reasons for a principled limitation to linguistic contexts: first, the relation between a lexical item and extralinguistic contexts is often crucially mediated by the purely linguistic contexts (consider the possible relations between horse and the extra-linguistic situation in That's a horse and There are no horses here); second, any aspect of an extra linguistic context **can** in principle <u>be mirrored</u> linguistically; and, third, linguistic context is more easily controlled and manipulated. (A,1)

2A   However, they [meaning and grammar] **can** <u>be disentangled</u> sufficiently to allow our study of lexical semantics to proceed. (A,2)

3A   But in attempting to decide whether the deviance in either case is grammatical or semantic, we are not wholly dependent on unaided intuition: reasoned arguments **can** <u>be deployed</u>. (A,2)

4A   In the case of 4 the deviance **can** <u>be cured</u> by inserting them after completed. (A,2)

5A   *We* **can** also point to the difference in degree of deviance between 4 and 5, which is out of all proportion to any difference of meaning between complete and finish. (A,2)

6A   A frequently mentioned, and as often criticised, criterion is that of 'corrigibility':[2] the idea is that syntactic deviances **can** be readily corrected, whereas semantic deviances cannot. (A,2)

7A   A frequently mentioned, and as often criticised, criterion is that of 'corrigibility':[2] the idea is that syntactic deviances can be readily corrected, whereas semantic deviances **cannot**. (A,2)

8A   Moreover, the notion of corrigibility is itself suspect: strictly speaking, *one* **can** only correct an utterance when one knows what the speaker intended to say, and this is not the case with the specially constructed sentences used in semantic analysis. (A,3)

9A   A more promising strategy is to ask not how or whether a deviant sentence **can** be corrected, but what the minimal changes are that will render it normal; then we examine the nature of the changes. (A,3)

10A   If a deviant sentence **can** be normalised by adjusting its grammatical structure - for instance, by changing the order or syntactic category of elements, or by adding, substituting or deleting one or more grammatical elements - then it would seem reasonable to suppose that its deviance is grammatical in nature. (A,3)

12A   We can now formulate a provisional test to determine whether a deviance is grammatical or semantic ('provisional', because, as we shall see, things are not so simple): if the minimal change required to 'cure' an anomaly in a sentence involves one or more closed set items, then the deviance is grammatical; if, however, the sentence **can** most easily be normalised by replacing one or more open set elements, then the deviance is semantic. (A,4)

13A   A correct diagnosis is also obtained for 3: since it [sentence 3] **can** be normalised by a simple substitution of an open set item, the test diagnoses its deviance as semantic. (A,4)

14A   Because grammatical elements typically need to have the capacity to combine normally with semantically very various roots, their meanings tend to be of a very general sort: the notion of past tense, for instance, **can** combine without anomaly with virtually any conceivable verbal notion. (A,5)

15A   Since the anomaly arises here from a clash between the meaning of a closed set item and the meaning of an open set item, it **can** be cured by changing either. (A,5)

16A A noun phrase in the X-position interacts semantically with *see* in a different way from a noun phrase in the Y-position (the exact nature of these interactions **can** be considered part of the meaning of *see*). (A,5)

20A If, by contextual manipulation, we can reduce the apparent oddness, or at least cause it to be perceived as communicatively appropriate, then we can take it that we are dealing with a semantic deviance (although the involvement of grammatical elements **cannot** be ruled out).[7] (A,7)

21A A purely syntactically ill-formed sentence, on the other hand, is irredeemably deviant, and the only contexts which **can** accommodate it are those which induce a tolerance for grammatical incompetence or, at any rate, nonconformity. (A,7)

22A A poetic context **can** also condition the reader or hearer to accept grammatical deviance, especially if syntactic well-formedness is clearly being sacrificed to some higher aesthetic end, such as the maintenance of rhyme, or metre, or some other patterning. (A,7)

23A The difference is that whereas a syntactic deviance may be tolerated, only a semantic deviance **can** be directly interpreted. (A,7)

24A A syntactically deviant sentence **can** be interpreted only by reference to a non-deviant sentence: a speaker, in other words, is not free to create his own grammar. (A,7)

25A Another way of formulating this criterion is to say that only a semantic deviance **can** be taken as a 'figure of speech'. (A,7)

26A By this test, sentence 2 is clearly grammatically odd - no context **can** improve it. (A,7)

27A Sentence 9, on the other hand, **can** be seen as a sort of ironic hyperbole. (A,7)

28A Even a sentence like *I finished mine tomorrow morning* **can** be contextualised so as to present itself in the guise of a jocular paradox. (A,7)

29A Objections **can** be raised to both these tests, and trickier examples unearthed. (A,8)

30A A good example of this imbalance **can** be seen in psycholinguistics, where the study of language comprehension, being more experimental, is markedly more advanced than the study of language production, in which the investigator has less control over what happens.

31B   The term 'text' refers to any instance of language, in any medium, that makes sense to someone who knows the language; *we* **can** characterize text as language functioning in context (cf. Halliday & Hasan, 1976: Ch. 1; Halliday, 2010). (B,3)

32B   To a grammarian, text is a rich, many-faceted phenomenon that 'means' in many different ways. It **can** be explored from many different points of view. (B,3)

35B   Both onset and rhyme **can** be further analysed as articulatory sequences of consonants and vowels: consonant and vowel phonemes, in technical parlance. (B,5)

37B   There is a form of order here that *we* **can** call constituency, whereby larger units are made up out of smaller ones: a line out of feet, a foot out of syllables, a syllable out of sequences of phonemes (perhaps with 'sub-syllable' intermediate between the two). (B,5)

38B   We get a good sense of the way the sounds of English are organized when we analyse children's verses, or 'nursery rhymes'; these have evolved in such a way as to display the patterns in their most regularized form. *Little Miss Muffet* **can** serve as an example (Figure 1-1).[2] (B,6)

39B   When a number of clauses are linked together grammatically we talk of a clause complex (each single linkage within a clause complex **can** be referred to as one clause nexus). (B,8)

40B   Words have constituents of their own, morphemes. These are not marked off in the writing system; sometimes they **can** be identified as the parts of a written word, e.g. eat + ing, curd + s, frighten + ed, or else recognized as traces of its history (beside, away were both originally dimorphemic). (B,9)

41B   But first, in the remainder of the present chapter, we will say a little more about compositional structure, including a more detailed sketch of phonology, so that *we* **can** take the relevant aspects of it for granted throughout the rest of the book. (B,10)

42B   Each unit is the domain of certain phonological systems, and it **can** be characterized in terms of a characteristic structure (the exception being the smallest unit, the phoneme): see the summary in Table 1-2. (B,11)

43B   These units **can** be divided into two regions of articulation and prosody. (B,11)

45B   In spontaneous dialogue, *speakers and listeners* **can** maintain the tempo across at least two feet of total silence; and the silent beat also plays a part in grammar, in making a contrast in meanings (see Chapter 7, Section 7.4.1.2). (B,14)

47B   But unlike writing, which is captured (even if very briefly) in time, so that written units **can** <u>be</u> clearly <u>marked off</u> one from another, speech is fluid and kinetic: there are no clear boundaries between its constituents. (B,15)

48B   So in a given passage of speech *we* **can** tell how many syllables there are, how many feet, and how many tone groups; and we can tell within limits where each one is located; but we cannot pinpoint exactly where each one begins and ends. (B,15)

50B   In children's nursery rhymes this correspondence is often preserved intact (this is why they are valuable in helping children learn the patterns of the language); but in adult verse of course it is not – on the contrary, it becomes an idealized motif on which endless meaningful variations **can** <u>be played</u>. (B,16)

51B   *We* **can** postulate an 'initial' state where the two variables are fully associated: at this point, the 'line' is just the poetic incarnation of the tone group. (B,16)

53B   Once a clause, for example, may be mapped either into one tone group or into two, this enhances its meaning potential in the flow of discourse; moreover, there are likely to be various places where the transition **can** take place. (B,17)

54B   All languages have something that **can** <u>be called</u> a syllable; but these somethings are far from being the same – if we compare just Russian, Japanese, Arabic and English we find great variation in how syllables are structured and how they function (for a systemic account of syllables in Mandarin, see Halliday, 1992c). (B,19)

55B   The discussion so far has raised a number of theoretical issues, as **can** <u>be seen</u> from the variety of technical terms that have had to be used. (B,20)

56B   There are many reasons for adopting this systemic perspective; one is that languages evolve – they are not designed, and evolved systems **cannot** <u>be explained</u> simply as the sum of their parts. (B,20)

58B   The way system and structure go together **can** <u>be illustrated</u> by showing a simplified version of the system network for MOOD (this will be explained in detail in Chapter 4): see Figure 1-9. (B,23)

59B   The way system and structure go together can be illustrated by showing a simplified version of the system network for MOOD (this will be explained in detail in Chapter 4): see Figure 1-9. This [the figure] **can** be read as follows. (B,23)

60B   The reason for this **can** best be explained in terms of the functions that language serves in human lives. (B,25)

61C   One of the many remarkable things about language is that *we* **can** use it daily without any real awareness of how it is structured. (C,1)

62C   Indeed, it is by the selection not just of lexical items but also of grammatical structures that we are able to express different meanings. In this way *we* **can** begin to point to the link between language wording, meaning expressed and situational context. (C,1)

63C   Essentially, therefore, the intention is to show how the analysis of syntactic structure **can** more fully and accurately reflect the meaning structure of the language. (C,2)

64C   This approach to the analysis of structural constituency is one which Halliday (1994a: 22) calls 'functional bracketing' and although it is orientated inherently towards the analysis of functional structure, it **can** of course be applied also to the analysis of formal constituency. (C,3)

65C   The differences between the two approaches **can** be illustrated with a contrastive analysis of *The cat sat on the mat* using non-technical terms. (C,3)

69C   During the 1970s, however, a stronger claim was made that the contextual dimensions of register account for the nature and meaning of the text and **can** even be said to determine it. (C,8)

70C   Spontaneous spoken language is the normal way of characterizing conversation or 'dialogue'. In addition, it **can** be found in a 'monologue' situation in which participation by more than the person speaking is effectively ruled out either because the speaker is 'hogging the conversation' and not letting anyone else get a word in edgeways, or where someone is giving a running verbal commentary on, say, a football match. (C,9)

71C   *We* **can** then illustrate the interaction of the experiential and logical subcomponents by reference to the above example *When she comes home, she always makes a cup of tea*. (C,12)

72C   The exchange of utterances in the social function thus follows very much a formulaic pattern which **can** be anticipated, and the language used merely serves to pave the way for more substantial discourse. (C,13)

73C   But in such circumstances the conversation could well remain at a superficial level because the topic is still being used as one which **can** be 'discussed' non-controversially and which will thereby help to remove the barriers to further social interaction. (C,13)

75C   Through personal mediation/modulation *the speaker* **can** also express his/her own personal attitudes towards the ideational content of what is being said (and his/her personal assessment of it). (C,14)

76C   Fourthly, through ellipsis *a person* **can** omit entirely repeated mention of those elements which he/she considers to be recoverable from an earlier part of the discourse. (C,15)

77C   Lastly, within the textual function, through the resources of conjunction (a broader concept than 'conjunctions') *the speaker* **can** insert words and phrases to mark different types of cohesive relationships between clauses and sentences. (C,15)

78C   In a broad sense the grammar seeks, through the semantic networks, to display the meaning potential which *the speaker* **can** utilize and, through the lexicogrammar, to indicate the wording which a given meaning may take. (C,17)

79C   A system **can**, however, also be developed through the establishment of subsystems, but these further options would not change the form of the initial system. (C,18)

80C   The intention of this book is not to examine how syntactic structures **can** be generated from semantic functional networks. (C,20)

81C   Language is an open-ended organism. Only by recognizing this **can** *we* account for the fact that it does not stand still - indeed has never stood still - but is constantly evolving. (C,21)

82C   Any descriptive grammar of a language is therefore merely a snapshot in history. There **can** thus be no definitive grammar of a language which can be held up as a point of reference for all time. (C,21)

85C   It **can** also be shown that in the structure of sentences some words have a closer relationship to each other than to other words in the same sentence. (C,21)

86C   Put another way, we find that words **can** be grouped together to form larger units. (C,21)

87C   In fact, several possible groupings of different sizes of unit **can** be identified between 'word' and 'sentence'. (C,21)

88C   In this way it **can** be seen that grammar is 'language led' rather than the other way round. (C,22)

89C   Syntactic structure **can** be approached in two ways: formal and functional. (C,22)

90C   Formal syntax deals with how words **can** combine to create larger units of form and eventually sentences. (C,22)

91D   You probably want to know what the purpose of this course is, and what *you* **can** expect to learn from it. (D,1)

92D   In any language *we* **can** identify a small number of regularly used sounds (vowels and consonants) that we call phonemes. (D,2)

93D   The pronunciation of English in North America is different from most accents found in Britain. There are exceptions to this - *you* **can** find accents in parts of Britain that sound American, and accents in North America that sound English. (D,4)

94D   Within the accents of England, the distinction that is most frequently made by the majority of English people is between northern and southern. This is a very rough division, and there **can** be endless argument over where the boundaries lie, but most people on hearing a pronunciation typical of someone from Lancashire, Yorkshire or other counties further north would identify it as "Northern". (D,4)

96D   These symbols are now used in almost all modern works on English pronunciation published in Britain, and **can** therefore be looked on as a *de facto* standard. (D,5)

97D   Although good arguments **can** be made for some alternative symbols, the advantages of having a common set of symbols for pronunciation teaching materials and pronunciation entries in dictionaries are so great that it would be very regrettable to go back to the confusing diversity of earlier years. (D,5)

99D   It represents the human head, seen from the side, displayed as though it had been cut in half. You will need to look at it carefully as the articulators are described, and you will find it useful to have a mirror and a good light placed so that *you* **can** look at the inside of your mouth. (D,8)

101D   The soft palate or velum is seen in the diagram in a position that allows air to pass through the nose and through the mouth. Yours is probably in that position now, but often in speech it is raised so that air **cannot** escape through the nose. (D,9)

104D   The tongue is a very important articulator and it <u>**can** be moved</u> into many different places and different shapes. (D,9)

105D   They [the lips] <u>**can** be pressed</u> together (when we produce the sounds p, b), brought into contact with the teeth (as in f, v), or rounded to produce the lip-shape for vowels like uː. (D,10)

107D   Finally, although there is practically nothing active that *we* **can** do with the nose and the nasal cavity when speaking, they are a very important part of our equipment for making sounds (which is sometimes called our vocal apparatus), particularly nasal consonants such as m, n. (D,10)

108D   Again, *we* **cannot** really describe the nose and the nasal cavity as articulators in the same sense as (i) to (vii) above. (D,10)

109D   If we say that the difference between vowels and consonants is a difference in the way that they are produced, there will inevitably be some cases of uncertainty or disagreement; this is a problem that <u>**cannot** be avoided</u>. (D,10)

110D   Consider English words beginning with the sound h; what sounds **can** come next after this h? (D,10)

112D   What we are doing here is looking at the different contexts and positions in which particular sounds **can** occur; this is the study of the distribution of the sounds, and is of great importance in phonology. (D,11)

113D   Study of the sounds found at the beginning and end of English words has shown that two groups of sounds with quite different patterns of distribution <u>**can** be identified</u>, and these two groups are those of vowel and consonant. (D,11)

114D   Tongue height <u>**can** be changed</u> by moving the tongue up or down, or moving the lower jaw up or down. (D,11)

116D   If you make the vowel in the word 'calm', which we write phonetically as ɑː, *you* **can** see that the back of the tongue is raised. (D,12)

117D   So now we have seen how four vowels differ from each other; *we* **can** show this in a simple diagram. (D,12)

119D   We have now looked at how *we* **can** classify vowels according to their tongue height and their frontness or backness. (D,13)

121E   Instead of looking at types of sounds as the source of human speech, *we* **can** look at the types of physical features humans possess, especially those that are distinct from other creatures, which may have been able to support speech production. (E,4)

122E   *We* **can** start with the observation that, at some early stage, our ancestors made a very significant transition to an upright posture, with bipedal (on two feet) locomotion, and a revised role for the front limbs. (E,4)

123E   Some effects of this type of change **can** <u>be seen</u> in physical differences between the skull of a gorilla and that of a Neanderthal man from around 60,000 years ago. (E,4)

127E   When we look closely at the etymologies of less technical words, we soon discover that there are many different ways in which new words **can** enter the language. (E,53)

128E   Yet many new words **can** cause similar outcries as they come into use today. (E,53)

129E   All these examples are nouns, but *we* **can** also create compound adjectives (*good-looking, low-paid*) and compounds of adjective (*fast*) plus noun (*food*) as in *a fast-food restaurant* or *a full-time job*. (E,55)

130E   This very productive source of new terms has been well documented in English and German, but **<u>can</u>** also <u>be found</u> in totally unrelated languages, such as Hmong (...). (E,55)

131E   To talk about the combined effects of smoke and fog, *we* **can** use the word smog. (E,55-56)

133E   The conversion **can** involve verbs becoming nouns, with *guess*, *must* and *spy* as the sources of *a guess*, *a must* and *a spy*. (E,57)

134E   Other forms, such as *up* and *down*, **can** also become verbs, as in *They're going to up the price of oil* or *We downed a few beers at the Chimes*. (E,57)

135E   It is worth noting that some words **can** shift substantially in meaning when they change category through conversion. (E,58)

136E Acronyms are new words formed from the initial letters of a set of other words. These **can** be forms such as *CD* ("compact disk") or *VCR* ("video cassette recorder") where the pronunciation consists of saying each separate letter. (E,58)

138E However, a much better set of examples **can** be provided from Kamhmu, a language spoken in South East Asia. (E,59)

140E If someone says that problems with the project have snowballed, the final word **can** be analyzed as an example of compounding in which *snow* and *ball* were combined to form the noun *snowball*, which was then turned into a verb through conversion. (E,60)

141E Many of these new words **can**, of course, have a very brief life-span. (E,60)

142E Yet, there clearly is some similarity between the languages, in that similar elements of the whole message **can** be found in both. (E,67)

146E So, *we* **can** say that all affixes (prefixes and suffixes) in English are bound morphemes. (E,68)

147E The free morphemes **can** generally be identified as the set of separate English word forms such as basic nouns, adjectives, verbs, etc. (E,68)

148E In words such as *receive*, *reduce* and *repeat*, *we* **can** identify the bound morpheme *re-* at the beginning, but the elements *-ceive*, *-duce* and *-peat* are not separate word forms and hence cannot be free morphemes. (E,68)

149E In words such as *receive*, *reduce* and *repeat*, we can identify the bound morpheme *re-* at the beginning, but the elements *-ceive*, *-duce* and *-peat* are not separate word forms and hence **cannot** be free morphemes. (E,68)

150E The set of affixes that make up the category of bound morphemes **can** also be divided into two types. (E,69)

CAN – ability

33B These two perspectives are clearly complementary: *we* **cannot** explain why a text means what it does, with all the various readings and values that may be given to it, except by relating it to the linguistic system as a whole. (B,3)

34B   These moments of prominence define a snatch of melody – a melodic unit, or line; and within this melodic progression we will be able to pick up a more or less regular beat, defining some rhythmic unit, or foot. *We* **can** perhaps recognize that the 'line' and the 'foot' of our traditional verse metres are simply regularized versions of these properties of ordinary speech. (B,5)

36B   Nevertheless, *we* **can** hear the patterns that are being created by the spoken voice. (B,5)

44B   So we may have an entirely silent foot, and many of the standard metres of English verse depend on this; there is in fact a silent foot at the end of the second and fourth lines of *If all the world was apple pie*, as *you* **can** tell by beating out the time while saying it. (B,14)

46B   The syllable is 'elastic' so that it **can** accommodate itself to the rhythmic requirements of the foot. (B,14)

52B   Listening to the four lines of the apple-pie rhyme *we* **can** hear that they make up a sequence of interrelated tone groups: beginning with a series that are alike, all ending on a rise, and ending with one that is distinct, with its final falling movement on drink. (B,16)

66C   Language represents just one of the ways in which *we* as humans **can** behave, that is to say can perform a behavioural act. (C,7)

67C   *We* **can**, of course, behave without resorting to the use of language: for example, we can play the piano, mow the lawn or cook the dinner. (C,7)

68C   We can, of course, behave without resorting to the use of language: for example, *we* **can** play the piano, mow the lawn or cook the dinner. (C,7)

83C   On the contrary, owing to the creative potential of language, *we* **can** produce utterances which we have never heard before and, likewise, can understand sentences which we may not have come across previously, e.g. / will check the speed of these spiders with John's digital watch. (C,21)

84C   On the contrary, owing to the creative potential of language, *we* can produce utterances which we have never heard before and, likewise, **can** understand sentences which we may not have come across previously, e.g. / will check the speed of these spiders with John's digital watch. (C,21)

95D   If you are a learner of English you are recommended to concentrate on BBC pronunciation initially, though as you work through the course and become familiar with this

you will probably find it an interesting exercise to listen analytically to other accents of English, to see if *you* **can** identify the ways in which they differ from BBC and even to learn to pronounce some different accents yourself. (D,4)

98D   We have a large and complex set of muscles that **can** produce changes in the shape of the vocal tract, and in order to learn how the sounds of speech are produced it is necessary to become familiar with the different parts of the vocal tract. (D,8)

103D   The hard palate is often called the "roof of the mouth". *You* **can** feel its smooth curved surface with your tongue. (D,9)

118D   If you learn the cardinal vowels, you are not learning to make English sounds, but you are learning about the range of vowels that the human vocal apparatus **can** make, and also learning a useful way of describing, classifying and comparing vowels. (D,12)

126E   That is, *we* **can** very quickly understand a new word in our language (a neologism) and accept the use of different forms of that new word. This ability must derive in part from the fact that there is a lot of regularity in the word-formation processes in a language. (E,53)

137E   Looking more closely at the preceding group of words, *we* **can** see that some affixes have to be added to the beginning of the word (e.g. *un-*, *mis-*). (E,59)

143E   *We* **can** recognize that English word forms such as *talks*, *talker*, *talked* and *talking* must consist of one element talk, and a number of other elements such as *-s*, *-er*, *-ed* and *-ing*. (E,67)

144E   There are freemorphemes, that is, morphemes that **can** stand by themselves as single words, for example, *open* and *tour*. (E,68)

145E   There are also bound morphemes, which are those forms that **cannot** normally stand alone and are typically attached to another form, exemplified as *re-*, *-ist*, *-ed*, *-s*. (E,68)

CAN – borderline cases

GRADIENT OF INHERENCY

11A   *We* **can** now formulate a provisional test to determine whether a deviance is grammatical or semantic ('provisional', because, as we shall see, things are not so simple): if the minimal change required to 'cure' an anomaly in a sentence involves one or more closed set

items, then the deviance is grammatical; if, however, the sentence can most easily be normalised by replacing one or more open set elements, then the deviance is semantic. (A,4)

17A   Without tampering with the deviant sentence itself, *we* **can** investigate the effects of placing it in variously elaborated discourse contexts. (A,7)

18A   If, by contextual manipulation, *we* **can** reduce the apparent oddness, or at least cause it to be perceived as communicatively appropriate, then we can take it that we are dealing with a semantic deviance (although the involvement of grammatical elements cannot be ruled out).[7] (A,7)

19A   If, by contextual manipulation, we can reduce the apparent oddness, or at least cause it to be perceived as communicatively appropriate, then *we* **can** take it that we are dealing with a semantic deviance (although the involvement of grammatical elements cannot be ruled out).[7] (A,7)

49B   So in a given passage of speech we can tell how many syllables there are, how many feet, and how many tone groups; and we can tell within limits where each one is located; but *we* **cannot** pinpoint exactly where each one begins and ends. (B,15)

57B   Grammar is the central processing unit of language, the powerhouse where meanings are created; it is natural that the systems of sound and of writing through which these meanings are expressed should reflect the structural arrangement of the grammar. They **cannot**, obviously, copy the functional configurations; but they do maintain the grammatical principle that units of different rank construe patterns of different kinds. (B,22)

74C   Closely linked to the idea of reactive comment through exclamation, through expressive interaction *people* **can**, again through exclamations, give vent to their emotions, but here without a content element. (C,13)

100D   If you look in your mirror with your mouth open, *you* **can** see the back of the pharynx. (D,9)

102D   The other important thing about the soft palate is that it is one of the articulators that **can** be touched by the tongue. (D,9)

106D   But the jaws are not articulators in the same way as the others, because they **cannot** themselves make contact with other articulators. (D,10)

111D   Now think of English words beginning with the two sounds bI; we find many cases where a consonant **can** follow (e.g. d in the word 'bid', or l in the word 'bill'), but practically no cases where a vowel may follow. (D,10-11)

115D   By changing the shape of the tongue *we* **can** produce vowels in which a different part of the tongue is the highest point. (D,12)

120D   Although the lips **can** have many different shapes and positions, we will at this stage consider only three possibilities. (D,13)

124E   The human mouth is relatively small compared to other primates, **can be opened** and <u>closed</u> rapidly, and contains a smaller, thicker and more muscular tongue which can be used to shape a wide variety of sounds inside the oral cavity. (E,4)

125E   The human mouth is relatively small compared to other primates, can be opened and closed rapidly, and contains a smaller, thicker and more muscular tongue which **can** <u>be used</u> to shape a wide variety of sounds inside the oral cavity. (E,4)

GRADIENT OF RESTRICTION

132E   The assumption seems to have been that if there is a noun ending in *-er* (or something close in sound), then *we* **can** create a verb for what that noun *-er* does. (E,57)

139E   From these examples, *we* **can** see that there is a regular pattern whereby the infix *–rnis* added to verbs to form corresponding nouns. (E,59)

8.2. Appendix 2: Tables

Tab. 1

CAN meaning	POSSIBILITY	ABILITY	PERMISSION	GRADIENT OF INHERENCY	GRADIENT OF RESTRICTION
Frequency	113	20	0	15	2
%	75.3	13.3	0	10	1.3

Tab. 2

CAN modality	DEONTIC	EPISTEMIC	DYNAMIC	INDETERMINATE
Frequency	115	0	20	15
%	77	0	13	10

Tab. 3

CAN forms/structure	AFFIRMATIVE	NON-AFFIRMATIVE	INTERROGATIVE
Frequency	137	12	1
%	91	8	1

Tab. 4

CAN possibility	INANIMATE SUBJECT	ANIMATE SUBJECT	ACTIVE VOICE	PASSIVE VOICE
Frequency	82	31	52	61
%	73	27	46	54
ACTIVE VOICE	21	31	-	-
PASSIVE VOICE	61	0	-	-

Tab. 5

CAN ability	INANIMATE SUBJECT	ANIMATE SUBJECT	ACTIVE VOICE	PASSIVE VOICE
Frequency	5	15	20	0
%	25	75	100	0