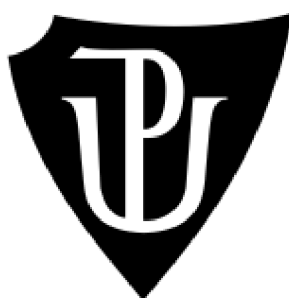**Palacký University Olomouc**

Faculty of Arts

Department of English and American Studies

Do Languages Shape the Way We Think?

The Case of Gender

Diploma Thesis

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Olomouc

2023

I hereby declare that I am the sole author of this thesis. All sources, references, and literature are all properly cited according to the Chicago Manual of Style.

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Date   Signature

Acknowledgements

First of all, I would like to thank my supervisor Mgr. Michaela Čakányová, Ph.D. for her patience, support, and encouragement. She is the best supervisor I could ever ask for. Also, I would like to thank my parents for always being there for me. Finally, a big thank you goes to everyone who agreed to participate in the experiments.

Annotation

Author:	Silvie Pospíšilová
Title:	Do Languages Shape the Way We Think? The Case of Gender
Title in Czech:	Formují jazyky naše myšlení? Jak je to s rodem?
Department:	Department of English and American Studies
Study program:	English Philology
Supervisor:	Mgr. Michaela Čakányová, Ph.D.
Pages:	72
Standard pages of text (/1800)**:**	73
Characters:	130691

Abstract:

The aim of this diploma thesis is to address the question "Do languages shape the way we think?" There are two main approaches to this question. The first approach known as linguistic universalism posits that all languages share an underlying structure which is hardwired in our brain; therefore, languages should not alter the way we think about the world. By contrast, an approach known as linguistic relativity assumes that every language encodes different categories, which necessarily leads to differences in cognition. Although the thesis provides an overview of existing relevant theories from various domains such as color or direction and motion, emphasis is put on the notion of conceptual and grammatical gender. Two experiments were conducted to compare English and Czech, two languages which employ different gender systems. Participants were asked to categorize objects and characterize nouns. The analysis of the results has shown that whether or not languages affect our thought is task dependent. The object categorization task brought conclusive results for English speakers only, while the noun characterization task did not demonstrate any important language effects for any group of the speakers. Even though language does seem to be part of thought, it may not necessarily always shape it because there are other factors such as culture which might be at play.

Abstrakt:

Cílem této diplomové práce bylo zabývat se otázkou „Formují jazyky naše myšlení?"
Existují dva hlavní postoje, které k této otázce přistupují. První postoj známý jako
jazykový universalismus předpokládá, že všechny jazyky sdílí skrytou strukturu, která
je pevně zakořeněná v našem mozku, a proto by jazyky neměly měnit způsob, jakým
přemýšlíme o světě. Naproti tomu stojí postoj známý pod názvem jazykový
relativismus, který má za to, že každý jazyk kóduje jiné kategorie, což nutně vede
k rozdílům v kognici. Ačkoliv tato diplomová práce poskytuje přehled existujících
relevantních teorií z různých domén jako barva nebo směr a pohyb, důraz je kladen na
konceptuální a gramatický jmenný rod. Byly provedeny dva experimenty, které
porovnávaly angličtinu a češtinu, tedy dva jazyky, z nichž každý používá jiný systém
rodů. Účastníci měli za úkol kategorizovat předměty a popisovat podstatná jména.
Analýza výsledků ukázala, že jestli jazyky ovlivňují naše myšlení závisí na tom, před
jaký úkol jsou účastníci experimentů postaveni. Kategorizace předmětů přinesla
přesvědčivé výsledky pouze pro anglické mluvčí, zatímco popis podstatných jmen
neprokázal žádné podstatné účinky jazyka pro žádnou skupinu mluvčích. Ačkoliv se
jazyk zdá být součástí myšlení, neznamená to, že ho nutně musí stále formovat, protože
ve hře mohou být i jiné faktory jako například kultura.

Klíčová slova:

Jazykový universalismus, jazykový relativismus, Sapirova-Whorfova hypotéza,
konceptuální rod, gramatický rod

TABLE OF CONTENTS

1   Introduction

The objective of this diploma thesis is to investigate whether the languages we speak shape the way we think when it comes to the case of gender. There are many languages spoken around the world and each of them differs from one another on many levels such as phonology, vocabulary, or syntax. The logical question that arises is whether this multitude of languages can skew our perception of the world around us. The main purpose of this diploma thesis is to present a brief overview of the existing approaches to the issue and then to build on Lera Boroditsky's research which proposes that speakers of different languages possess different cognitive abilities (Boroditsky 2011).

Although this diploma thesis is inspired by Lera Boroditsky's 2011 article on how language shapes thought, the issue of whether languages influence the way we think and perceive the world has been a matter of debate for a long time. It was Wilhelm von Humboldt, a German philosopher and diplomat, who drew attention to the issue in the 19th century. He voiced the idea that we should study languages not because they differ in phonetics and vocabulary, but because they provide insight into our minds. In his own words, "[t]he difference between languages is not only in sounds and signs but in worldview" (Deutscher 2010, 135). The topic, however, gained in popularity in the 20th century when Edward Sapir and his student Benjamin Lee Whorf put forward their ideas about the speakers of indigenous languages in North America. Sapir and Whorf argued that the way the speakers of languages such as Hopi think differs from the way English speakers do. For example, the Hopi language speakers do not think of time using phrases such as *five minutes*, because their language does not offer these categories. To quote Guy Deutscher, "[i]t was difficult not to get carried away by the view. Sapir and Whorf became convinced that the profound differences between languages must have consequences that go far beyond mere grammatical organization and must be related to profound divergence in modes of thought" (Deutscher 2010, 130).

This diploma thesis explores these and other related theories in more detail. The thesis is divided into two parts: theoretical and practical. The first several chapters of this thesis provide an overview of the existing theories regarding the relationship between language and thought, and of how these theories differ. Arguments for and

arguments against the idea that languages shape the way humans think will be presented and analyzed.

The practical part centers around the notion of gender and how it affects the perception of the world by Czech and English native speakers. Although English does not have grammatical gender, it does occasionally use metaphorical gender with certain nouns. The experiments in this thesis replicate to a certain degree experiments conducted by Maria Sera et al. and by Lera Boroditsky (Gentner and Goldin-Meadow 2003, 69). In the first experiment, participants were supposed to assign either male or female voices to shown objects. Using this method, Sera et al. examined the possible effects of gender in a language on the categorization of objects (Sera et al. 2002, 377). The second experiment is focused on the characterization of nouns. The aim of the experiments in this thesis is to investigate whether Czech native speakers and English native speakers react to the presented pictures and describe nouns differently, and whether these different reactions may be attributed to the speakers' mother tongue, or, to be more accurate, to the presence or absence of the grammatical gender in their mother tongue.

2   Literature Review

Language is a crucial part of our lives. It is a system for conveying ideas and expressing thoughts and feelings. Given the striking variety of the languages used around the world and the fundamental differences among them, the key question is whether speaking a specific language affects thought and whether it makes a person experience the world differently. As Fromkin, Rodman, and Hymans state, "it is natural to imagine that something as powerful and fundamental to human nature as language would influence how we think about or perceive the world around us" (2011, 310). There are two main approaches to this conundrum. According to one approach known as linguistic universalism, all languages share some underlying structure. This underlying, deep structure is encoded in the human brain, which means that language should not hold sway over cognitive processes. The main proponent of this approach is Noam Chomsky, an American linguist and social critic. On the other hand, an approach known as linguistic relativity assumes that the language we speak influences how we think. Fromkin, Rodman, and Hyams (2011, 311) describe linguistic relativity as a theory which claims "that different languages encode different categories and that speakers of different languages therefore think about the world in different ways." In other words, language plays an important role when it comes to the categorization of objects, to describing the surrounding world, but also to the ability to think about the surrounding world in a specific way. Perhaps the most famous proponents of this approach are Edward Sapir and Benjamin Lee Whorf. Vaňková reminds her readers that linguistic universalism and linguistic relativity can be compared to looking at things with the naked eye versus looking at things while wearing glasses. Eyes are the part of the human body which sees the reality properly; however, when we put on glasses, the reality may become altered (2007, 54). In this metaphor, eyes represent the universalist approach, while glasses stand for the relativist approach according to which language shapes how we see the world. This diploma thesis will explore these two opposing views in more detail in the following chapters.

Why is it even important to investigate whether languages we speak shape the way we think? If the claim is correct, and languages we speak do alter our thought, there may be far-reaching consequences. Despite the fact that there are many contradictory theories related to the topic, Boroditsky and her colleagues (Boroditsky,

Fausey, and Long 2009) are confident that language does play a crucial role in shaping thought and various aspects of cognition. In their 2009 study, the authors were interested in the eyewitness testimony field; to be more specific, their goal was to find out how speakers of English and speakers of Japanese describe and remember both intentional and accidental events. The study uncovered that there were certain differences between speakers of the two languages when it came to describing and remembering accidents. According to the authors of the study, "English speakers described accidents using more agentive language than Japanese speakers did and also remembered agents of accidents better than Japanese speakers did" (2009, 2430). This means that English speakers tend to name the agent of the action even when the event in question is an accident, whereas Japanese speakers do not typically reveal the doer of the action in the same situation. As far as the memory task is concerned, the authors of the study note that in Japanese, it is more natural to describe accidents using non-agentive expressions, which therefore contributes to the poorer results in the memory test (2009, 2427). The reason for English speakers performing better may be the fact that they are inclined to name the agents of accidents while recounting events.

Another study which examined the influence of language in the eyewitness testimony field was conducted by Ibarretxe-Antuñano and Filipović. These linguists were interested in discovering whether speaking a different language may cause issues related to translation and interpreting. For the purposes of their study (Ibarretxe-Antuñano and Filipović 2013), they examined police interview transcripts. They were particularly interested in interviews with witnesses who spoke Spanish and whose statements were subsequently interpreted to English by certified interpreters. They based their study on Leonard Talmy's terminology for encoding motion events. Talmy (2009) divides languages into two main groups—satellite-framed and verb-framed languages. Satellite-framed languages, such as English or Czech, tend to encode the manner of motion (*run, jump*) in the verb itself, while the path information (*up the stairs, across the road*) is typically encoded outside of the verbal root. On the other hand, encoding the manner of motion is only optional for verb-framed languages such as Spanish. For these languages, it is the path information which is included in the verb. It does not mean that English, a satellite-framed language, does not have verbs which encode path information; for example, verbs such as *ascend* or *turn* encode path information. However, the key difference between the two types of languages is the

preferred lexicalization of motion events. In most cases, English tends to express the manner of motion in the verbs, while the path information is expressed as a prepositional phrase. Ibarretxe-Antuñano and Filipović took advantage of this distinction between languages and compared the original witness statements with their certified translations. The results were astounding. Translation into Spanish would usually omit manner of motion altogether, but translation into English would involve adding manner where there was originally none in Spanish (Ibarretxe-Antuñano and Filipović 2013, 271). The authors argue that the inaccurate translations arise due to Spanish texts aiming at locating the protagonist at scene, while English texts tend to favor motion descriptions. In other words, in Spanish texts, it is not typically mentioned how a location was reached (2013, 271). Needless to say, these inaccurate translations may possibly cause misunderstandings and even hinder identifying suspects. The findings of the study by Boroditsky and her colleagues as well as the study by Ibarretxe-Antuñano and Filipović show that if language does influence thought, it could have wide implications and that disciplines such as forensic linguistics would benefit from exploring the matter even further.

However, it is not necessary to look into witness statements in order to find examples of subtle language influence. For instance, language influence from everyday life can be observed in the marketing domain. Using words with positive connotations may help attract clients or customers. Bolinger quotes examples from the real estate market domain, where *down payment* is desirable to be replaced with *initial investment* when talking to clients, and *sign here* should be replaced with *write your name as you want it to appear on your deed* (1973, 546). These tricks involving careful wording and language with positive connotations could make great impressions and affect how clients think about the transaction. Moreover, coming up with attractive-sounding product names and descriptions is crucial and may result in increased sales. *A deep-sea blue towel* sounds more appealing that just a regular *blue towel*. *A pine green pencil crayon* somehow sounds more intriguing than just *a green pencil crayon*. One more example of subtle language influence concerns euphemisms. When reporters talk about *suspects*, they might use the phrase *a person of interest* instead. Calling *an unemployed person* a person who is *between the jobs* also "softens the blow". Although euphemisms are the perfect tool for being politically correct, Pinker adds a valid point about them: he introduces the term *the euphemism treadmill* (Steven Pinker 1994). The euphemism

treadmill describes a phenomenon where a euphemism which is used to replace an offensive term takes on negative connotations simply because it is being used over and over again to replace the given offensive term. Consequently, this euphemism is not considered a euphemism anymore and needs to be replaced by a new euphemism. This process can be repeated many times. To demonstrate what the euphemism treadmill means, Pinker mentions that *garbage collection* was replaced by *sanitation*, which was subsequently replaced by *environmental services* (1994). The bottom line of Pinker's research is that words remain the same; however, it is the connotations and concepts in our minds that become different over time. Nevertheless, we do not think about these concepts differently just because we use different words for them. To rephrase, the words—that is, the language—we use do not change our thought. Unlike, for instance, Boroditsky's findings, Pinker's ideas go against the theory of linguistic relativity.

Even though this diploma thesis is not concerned with multilingualism and personality, it may be worth mentioning that some linguists and psychologists go as far as to describe a special phenomenon related to the topic of this diploma thesis. The phenomenon is called the feeling different phenomenon, and it describes the fact that multilingual speakers report feeling different when switching from one language to another. An example of a study which deals with this phenomenon is a 2013 study by Dewaele and Nakano. In their experiment, multilingual participants filled out an online questionnaire in which they were asked to give answers using a Likert scale; each question was repeated for every language the participants could speak. Questions asked in this study included, for example, *How serious do you feel in this language?* (2013, 113). As the authors of the study conclude (2013, 117), the answers reveal that, apart from other things, multilingual participants feel less emotional and less serious in the languages they acquired later.

Thus, if a language a person speaks can make them feel different, can a language also have significant effects on people's thought and cognition? In order to attempt to answer the question, it is important to make a distinction between language and thought. The difference between these two terms will be explained in the following subchapter.

2.1 Language Versus Thought

It may seem logical to assume that language and thought are one and the same concept, but the truth is not that simple. Although these two terms are closely related, there are

certain differences. The questions that arise are: what is the relation between language and thought? And do people think in language?

According to Vygotsky, there have always been two extreme views. The first view represents the idea that word and thought are considered identical; the second view deems word and thought as two isolated and independent entities (Vygotskij and Průcha 2004, 24). Vygotsky himself was a proponent of the former view; that is, language becomes inseparable from thought. He supports his claim by dividing speech into external speech and inner speech. Since external speech is defined as a speech for others, it will have a different function from the inner speech. Nevertheless, even inner speech, which is defined as a speech for oneself, is seen as a vocalized thought. As a result, language becomes internalized, which means that it cannot be isolated from thought (2004, 51).

According to another, opposing view, language and thought should not be seen as inseparable. On the contrary, they are two different entities; language being sketchy, thought being rich (Gleitman and Papafragou 2013, 505). One proof to support this view is that words are often ambiguous, which means that there have to be more distinct concepts in our thought. Gleitman and Papafragou (2013, 505) quote expressions such as *my uncle* to prove their point. In English, *uncle* does not carry the information which would specify whether it is the maternal or the paternal uncle, nor whether it is a blood relative. Nevertheless, the speaker who uses the expression *my uncle* knows all the relevant information. Therefore, once again, language is sketchy and thought is rich, which means that the two terms cannot be interpreted as one concept.

Another evidence supporting the idea that language and thought form two separate entities comes from patients with aphasia. Aphasia is the inability to understand or produce speech due to brain damage. Fedorenko and Varley (2016) examined several aphasiacs. As they explain (2016, 132), "these individuals are nonetheless able to add and subtract, solve logic problems, think about another person's thoughts, appreciate music, and successfully navigate their environments." This statement is corroborated by brain imaging. The authors conclude that "many aspects of thought engage distinct brain regions from, and do not depend on, language" (2016, 132). Thus, an aphasiac who cannot formulate their thought into language is still able to perform various tasks involving thinking. This verdict goes hand in hand with

Gleitman's and Papafragou's idea that language does not equal thought, and also that thought is extensive and language can only express fragments of it (2013, 505).

What also supports the notion that language and thought need to be seen as two separate entities is creativity. In his book *The Language Instinct*, Pinker (1995, 70) maintains that many creative people get their inspiration when they think in mental images rather than in words. He cites Joan Didion, the author of the novel *Play It As It Lays*, who apparently said that her "acts of creation begin not with any notion of a character or a plot but with vivid mental pictures that dictate their choice of words" (1995, 70). In the end, it may not even be a matter of creative writing: sometimes it may be tricky for someone to get their ideas across to readers or listeners in everyday conversations. It surely happens to everyone from time to time that they search for the right words to express a thought, but struggle to find them.

Moreover, what about sounds or smells? Do we think about them in words? Can a melody which is stuck in our head even be convertible to words? It would appear that language is not the right tool to describe a sound or a smell. Pinker tries to find a solution by introducing the term mentalese, also known as language of thought (1995, 56). Mentalese could be described as a representation of thought in the brain without words. Pinker continues that our thoughts, separate from language, are only "clothed in words whenever we need to communicate them to a listener" (1995, 56). The consequence of mentalese is that thought is independent of language; therefore, people do not think in the language they use to communicate. With that being said, English or Czech native speakers do not think in English or Czech, respectively, but in a metalanguage which Pinker calls mentalese.

In summary, language and thought are interconnected. Language serves as a medium we use to express our thoughts; nevertheless, we do not always necessarily need language to do so. For example, expressing a smell in words may prove to be a difficult task. As mentioned above, Pinker puts forward the idea of a metalanguage called mentalese, which would account for the fact that certain concepts are too complex to be expressed in words. Furthermore, some linguists take the relationship between language and thought one step further and claim that language not only helps convey our thoughts to the listener, but that it also shapes our thought. This diploma thesis will explore these claims in the next chapter.

2.2 The Beginnings

Although the idea that language shapes the way we think was made popular by Benjamin Lee Whorf (1940, 6) and Edward Sapir (1929, 209), its origins can be traced back to Wilhelm von Humboldt. As reported in Deutscher (2010, 134–35), Humboldt became fascinated by the Basque language when he realized that it is different from any other European language he knew. In particular, Basque grammar could not be compared to Latin, which was a groundbreaking revelation in the 19th century. Humboldt arrived at a conclusion that the language we speak provides us with a different worldview, which also happens to be the ultimate reason why we should study languages. It is, however, important to emphasize that Humboldt never claimed that language exerts complete influence on our thought. According to Deutscher's observations (2010, 136), Humboldt argued that all languages are able to express any thought; the difference is merely in what a particular language encourages its speakers to express.

Franz Boas, a German-American anthropologist, drew similar conclusions from his own research. As reported in Underhill (2009, 21), Boas believed that "all languages divide experience into conceptual classifications and that these classifications differ from language to language." An example of these different classifications could be grammatical gender, which, in Boas's opinion, serves to prove that languages do influence thought. Also, while Boas emphasized the importance of the relationship between language and culture, he was opposed to the idea that language downright dictates culture (2009, 21). In other words, people may keep speaking the same language during their lives but change their culture, and vice versa; people may retain their culture while speaking another language. Similarly to Humboldt, Boas pointed out that language obliges its speakers to express certain aspects of experience, and that these obligatory aspects vary from language to language. It was not until several decades later when the Russian-American linguist Roman Jakobson picked up on Boas's observations about the obligatory aspects and summarized them as follows: "Languages differ essentially in what they must convey and not in what they may convey" (Jakobson 1987, 433). This became to be known as the Boas-Jakobson principle, meaning that language influences our thought not because it allows us to think in a certain way, but because it repeatedly draws our attention to specific obligatory aspects. In practical terms, it means that languages such as Czech obligate its

speakers to express, for example, the grammatical gender of the subject when uttering a sentence such as:

(1) *Šla*   *jsem   domů.*
      go-PST-1SG-FEM   AUX   home
      'I went home.'

As can be seen in the example, the English equivalent *I went home* does not require English speakers to specify for gender.

In the 20th century, it was the American linguist and anthropologist Edward Sapir who followed up on Boas's research. His views can be encapsulated in one of his famous quotes: "Human beings do not live in the objective world alone, nor alone in the world of social activity as ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society" (Sapir 1929, 209). What Sapir has in mind is that the language we speak affects our thoughts and the perception of the world, and that we cannot escape its influence. Sapir's article continues as follows: "No two languages are ever sufficiently similar to be considered as representing the same social reality" (1929, 209). This strong claim would mean that even mutually intelligible languages such as Czech and Slovak were not similar enough for their speakers to perceive the world in the same way.

At one point during his career, Sapir became fascinated by the idea of studying Native American languages. He was particularly interested in the Nootka language, which is a language spoken on Vancouver Island in Canada. He used Nootka to demonstrate that speakers of different languages perceive actions differently. As Sapir elaborates, the English sentence *the stone falls* is interpreted by English speakers as two different, albeit related, notions: the stone as an object and the action of falling. Nevertheless, speakers of Nootka do not analyze the event in the same manner as English speakers do. Instead, Nootka speakers use the phrase *it stones down*. Rather than referring directly to *the stone*, Nootka speakers use a verbal form consisting of two elements: the position of the stone and the downward direction (Sapir 1924, 154–55). To put it another way, Nootka does not have any equivalent of the English verb *to fall*. Thus, the Nootka speakers' perception of the falling action must be different from the English speakers' perception, according to Sapir. Deutscher points out that even though some phrases in another language may sound strange or unnatural to speakers of another

language, it does not necessarily mean that speakers of the two languages in question perceive reality differently. The phrase *it rains* is a shining example (2010, 140). In fact, the wording in Czech is different, too—Czech speakers can use the phrase *padá déšť* to express the action of raining*:*

(2) *Padá   déšť.*
     fall-PRS-3SG-NEUT   rain
     'It rains.*'*

Does it mean that English and Czech speakers perceive or experience rain differently? The answer to this question is no. The different grammatical structures do not cause speakers of these two languages to perceive rain in a different way.

Another important name which should not be missing in this diploma thesis is Benjamin Lee Whorf. Whorf, as Pinker points out, was a fire inspector who dabbled in linguistics (1995, 59). Whorf became Sapir's student, and the influence of Sapir's ideas is evident in Whorf's work. His frequently-quoted proposition includes: "We dissect nature along lines laid down by our native languages" (Whorf 2012, 212-13). Just as Sapir, Whorf was convinced that grammatical systems of languages influence our thought. In fact, Whorf took Sapir's ideas one step further and claimed that language not only influences our ideas; it downright shapes them. Ironically, Whorf, with less education in linguistics, is more radical in his theories than Boas or Sapir. However, both Sapir and Whorf assumed that differences between cultures are caused by differences between languages. They formulated their theory on the influence of language on thought and perception in what is known today as the Sapir-Whorf hypothesis. The hypothesis is based on the idea that the grammatical categories and structures we habitually use form our view of the world. As explained in Pinxten (1976, 100), there are two versions of the Sapir-Whorf hypothesis: linguistic determinism and linguistic relativity. The strong version, linguistic determinism, presumes that language structures downright determine thought and perception. Therefore, our cognitive abilities are predetermined by our mother tongue. The weak version, linguistic relativity, assumes that linguistic structures of different languages influence thought and categorization, but only to a certain degree.

It has been established that the strong version of the hypothesis is no longer acceptable. There are multiple reasons for the rejection. First, we should ask ourselves

"how, if we are unable to organize our thinking beyond the limits set by our native language, we could ever become aware of these limits" (Pinxten 1976, 101). To rephrase Pinxten's assertion: if we are even able to consider the idea of some limits imposed by our mother tongue, then we are thinking beyond these limits to begin with. This means that linguistic determinism should be a priori false.

Furthermore, if linguistic determinism was correct, it would render borrowings from other languages impossible. This is because the limits set by our mother tongue would prevent us from understanding foreign concepts. Food is a good example to demonstrate why the Sapir-Whorf hypothesis in its strongest form cannot be true. For example, Czech speakers use the loanword *poutine* to refer to the dish of Canadian origin. Czechs did not have a word for it because they had not encountered the dish, but once *poutine* became known all around the globe, the need arose to borrow a word to convey the meaning. Despite *poutine* in Czech being a loanword describing a foreign dish, Czech native speakers understand the word; moreover, they do not experience the taste of *poutine* differently from Canadian English native speakers. This resembles the false idea of experiencing rain differently based on the way how a particular language expresses the action of rain falling. As is the case with the rain, the language we speak does not dictate how we taste food. This is where biology comes into play—we, humans, have the same taste buds, and the language we speak cannot alter them.

In addition, if linguistic determinism was correct, even speakers of a different variety of the same language would not be able to grasp concepts from another variety of the same language. An example which comes to my mind is from Canadian English. Canadian English, being a native variety of North American English, uses the term *a Muskoka chair* to refer to what is known as *an Adirondack chair* in English spoken in the United States. Do the two different terms for the same type of an outdoor chair predetermine how Canadian English speakers and American English speakers experience sitting in this chair? The answer to this question is no. It could be objected that these examples are far-fetched; however, they are compatible with Whorf's claims on linguistic determinism and on how languages predetermine our perception of the world.

One more controversy connected with linguistic determinism is Whorf's claim that English has only one word for snow, whereas the Eskimo language Inuit has a far greater number of words for snow, which therefore affects the Inuit speakers'

perception of the world. The original quote is as follows: "To an Eskimo, this all-inclusive word would be almost unthinkable; he would say that falling snow, slushy snow, and so on, are sensuously and operationally different, different things to contend with; he uses different words for them and for other kinds of snow" (Whorf 1940, 8). Thus, according to Whorf, English speakers' perception of snow must be limited in comparison to Inuit speakers because Inuit has more words for snow. Nonetheless, Pullum wrote a mocking article in which he drew attention to the fact that the number of Inuit words for snow varies each time it is mentioned. According to Pullum, the number ranges from Whorf's seven to a Cleveland TV weather forecaster's two hundred (Pullum 1989, 277-8). The point of the article is to show the absurdity of Whorf's claim. Even if the Cleveland TV weather forecaster was right and Inuit did use two hundred words to describe different types of snow, it would not mean that language determined the number and altered the Inuit speakers' experience of the world. Rather than that, the large number of snow terms would be attributed to the area where the Inuit live. Since they are surrounded by snow, they might need more terms for it. However, it has already been discovered that "Inuit has no more words for snow than English does" (Fromkin, Rodman, and Hyams 2011, 313). Also, there is one basic problem with Whorf's claim about the alleged lack of English words for snow. In fact, English does have a decent number of expressions to describe snow. To name a few, English speakers can talk about *slush, powder, sleet, penitentes, lake effect snow*, and so on. Also, if there was no word for a specific type of snow in English, speakers could always paraphrase it to get the meaning across. Therefore, the stunning Inuit snow terminology is a misleading claim which should be disregarded.

While linguistic determinism has fallen out of favor, linguistic relativity remains a controversial topic which is often the subject of heated debates. Some researchers defend the idea of linguistic relativity, but some researchers argue against it. Selected claims both for and against linguistic relativity will be dealt with in the next chapter. However, before this thesis delves into these claims, it is necessary to mention that every theory has its proponents as well as its critics. While Sapir and Whorf support the idea of language influencing our thought, other linguists heavily criticize it. The most famous opponent of the Sapir-Whorf hypothesis is Chomsky. In the 20th century, Chomsky stepped in and introduced an alternate theory called the Universal Grammar theory. Chomsky and his colleagues proposed that there is an innate structure in the

human mind which enables us to learn a language: "We take as uncontroversial the existence of some biological capacity of humans that allows us (and not, for example, chimpanzees) to readily master any human language without explicit instruction" (Hauser, Chomsky, and Fitch 2002, 1571). Essentially, Sapir and Whorf argue that speakers of different languages not only speak a different language, but they also think in a different way *due to* speaking a different language. On the other hand, Chomsky maintains that all people—that is, even speakers of different languages—are all the same *because* they can speak a language. Since they all speak a language, they all also share an innate structure which underlies languages.

The lack of instruction Chomsky mentions is also one of his main arguments which, in his opinion, supports the existence of Universal Grammar. He is convinced that children could not possibly acquire a language so effortlessly if it was not for an innate structure to help them. Chomsky questions "the huge gap between data available and state attained" (Chomsky 2012, 61). This issue has been labeled as the poverty of the stimulus. It calls into question the fact that children do not receive sufficient input, and yet, they are able to work out the rules and come up with grammatical sentences in their language. Chomsky also developed the idea of Generative Grammar. He assumes that there are hierarchical structures which underlie language (Chomsky, Gallego, and Ott 2019, 232). According to Chomsky, there is a universal deep structure which all humans share, and then there are surface structures which vary depending on a language. Some linguists such as Pinker are in favor of Chomsky's point of view. Pinker himself (1995, 238) argues that languages are fundamentally the same because of the deep structure they share, and he also agrees that languages are nevertheless allowed to set certain parameters the way they wish to. This is reflected in the distinct lexicons of languages as well as in other details such as, for example, being a pro-drop language. Some languages choose to omit pronouns in certain cases, while some languages disallow pro-dropping. According to both Pinker and Chomsky, this distinct setup of parameters does not contradict the idea of Universal Grammar.

On the other hand, some linguists such as Tomasello stand in opposition to Chomsky's notion of Universal Grammar. Tomasello attacks the poverty of the stimulus argument and offers another theory to account for children's ability to acquire language. He and Ibbotson suggest that "children learning language use general cognitive abilities and the reading of other people's intentions" (Ibbotson and Tomasello 2016, 71). In

other words, children use general learning mechanisms which they also apply while learning anything, not just language.

It is evident that there is no consensus on which theory is correct. On the one end of the spectrum, there are researchers who insist that languages affect our thought; this group of researchers approves of the idea of linguistic relativity. On the other end of the spectrum, there are researchers who prefer the universalist approach which posits that our capacity to learn languages is hardwired in our brains. Therefore, we all share the same innate structure, which is the reason why there is no effect of language on our thought. Although the focus of this thesis is the relationship between grammatical gender and thought, I will briefly review theories concerning not only gender, but also color and direction in order to paint a better picture of the differences between the two contradictory approaches, linguistic relativity and linguistic universalism.

2.3 Color

This chapter will examine how linguistic relativity and linguistic universalism are reflected in relation to color. A supporter of linguistic determinism would probably argue that people who do not have a term for a specific color would not be able to distinguish the given color from other colors. Of course, this radical view has been proven to be false because language does not alter our cone cells which are responsible for color vision. People do not become color blind to the colors they do not have a word for. But what about certain aspects of cognition such as memory or categorization? Can they be affected by the number of color terms in language or by the way language divides the color spectrum? Here it may be useful to introduce the term implicational hierarchy, which refers to a theory developed by Berlin and Kay. They proposed (1991, 22–23) that basic color terms can be thought of in terms of seven stages in which they evolve in any given language. Altogether, there may be no more than eleven basic color terms in any given language. For example, if a language reaches stage I, it only contains two basic color terms—black and white. If a language reaches stage II, then it will have three color terms—black, white, and red. In practical terms, it means that if a language has a word for red, it will also have a term for black and white because black and white are included in the most basic stage, stage I. However, if a language has a word for red, it may not necessarily have a word for gray because gray is a color term from stage VII. To put the implicational hierarchy into perspective, if a language has not reached stage VII, speakers of that language can still see colors from stage VII; Berlin and Kay's

implicational hierarchy does not imply that speakers of languages cannot discriminate between colors from a stage which is higher than the stage in their mother tongue. This has been shown in a series of experiments by Rosch. In one of her studies (1972), she looked at the Dani people who live in Western New Guinea and whose language only contains two basic color terms; one which covers dark colors, and one which covers light colors. Participants were shown chips of various colors and asked for a description. From the descriptions they used, it was evident that the Dani speakers were still able to recognize colors for which they do not have a term in their mother tongue (1972, 449). The Dani had to use paraphrases to describe colors, but it did not affect their color perception. In another experiment by Rosch (1987, 270), the Dani were presented with a color memory task in which they were briefly shown a color, and after a period of 30 seconds, they were asked to pick the same color from an array of colors. When Rosch compared the results with the American participants of the same experiment, she found out that Dani speakers' performance was worse. Rosch admits that the results may appear to prove the validity of linguistic relativity, but, according to her, it should be noted that the Dani are "a preliterate people, living in face-to-face communities, probably without need for or training in techniques for coping with the kind of overloads of information which this unfamiliar memory test required" (1987, 270). Rosch thus attributes the Dani's poorer performance to the unfamiliarity of the task, which ranks her among the opponents of linguistic relativity. She insists that it is the external factors which caused the poorer performance, not the language the Dani speak.

Some languages go beyond the basic color terms. Instead, they divide the spectrum in a different way. The most cited example can be found in Russian. Russian words *goluboy* (light blue) and *siniy* (dark blue) cover what would be called *blue* in English or Czech. Winawer et al. conducted a study (2007) in which they showed three blue squares to English and Russian speakers. One of the two bottom squares was of exactly the same shade of blue as the top square, and the participants' task was to press a button as fast as possible to indicate which one. The authors of the study were interested in the reaction time. It was uncovered that Russian speakers were faster at matching squares if the squares were from a different category in Russian—one *goluboy* and the other one *siniy* (2007, 7783). Winawer et al. conclude that categories such as color terms in language do affect performance on perceptual color tasks (2007, 7780).

This conclusion is in line with the idea of the weaker version of the Sapir-Whorf hypothesis.

Russian is not the only language which obligatorily employs more than one word for *blue*; Greek uses *ghalazio* to cover lighter shades of blue and *ble* to cover the darker shades. Thierry et al. took advantage of the distinction and conducted a study which brought similar results as Winawer et al.'s study. In Thierry et al.'s experiment (2009, 4567) which involved measuring brain potentials, participants—Greek and English speakers—were shown rows of shapes. The rows of shapes differed either in the shade of blue (light blue versus dark blue) or in color (blue versus green shapes); there were always two deviant shapes of a different shade in any given row of shapes. The participants' task was to detect a square in the presented stimuli; the square acted as "the odd one out". While the participants were focused on detecting the odd shape, the experimenters were interested in finding out what the brain activity was going to be like when the participants spotted the deviant shade in each row. Brain activity was expected to be higher when Greek speakers spot the deviant shade of blue because for them, these are not just different shades, but different colors. This hypothesis proved to be correct. As Thierry et al. put it, "findings show a greater distinction between shades of blue than different shades of green in Greek participants, whereas English speakers show no such distinction" (2009, 4568). The findings of this study therefore point in the direction of linguistic relativity and unconscious effects of language on color discrimination.

Regier and Kay (2009) try to establish some middle ground between the relativist and universalist approach. Instead of asking whether language affects color perception, they ask whether language might affect only half of color perception. Since it is the left hemisphere which is language dominant, Regier and Kay expect color perception to be affected by language mainly in the right visual field (2009, 439). This is because the right visual field signals cross through the corpus callosum to the left hemisphere where they get processed. In their article, Regier and Kay quote several studies which entailed a lateralized visual task. For example, a study by Gilbert et al. (2006) measured reaction times. Targets in the right visual field were processed faster when the target color and the distractor color had a different name (2006, 489), which implies the influence of language on processing. Regier and Kay also reviewed some studies which seem to support the idea of a shift from prelinguistic infants' color perception effects in the left visual field to adults' color perception effects in the right visual field. The shift may be

caused by language acquisition; however, Regier and Kay admit that more light needs to be shed on the issue to confirm the hypothesis. In any case, their article offers an innovative view which could settle the dispute between relativists and universalists.

Color perception is a domain which appears to be consistent with linguistic relativity as seen in the studies on Dani, Russian, or Greek speakers. Rosch would probably beg to differ because she believes that external factors caused the Dani's worse performance compared to the English speakers' performance. However, it appears as speakers of a language with a word for a particular color will be more likely to remember the color they had just seen, rather than the color they do not have a word for. While the lack of a word for a particular color will not hinder a person's ability to recognize the color, it may slow down their color discrimination or color categorization speed.

2.4 Direction and Motion

Another domain which will be examined in this thesis concerns direction and motion. According to Papafragou, Massey, and Gleitman (2002, 192), direction and motion is a suitable area to study because just like color perception, navigating is fundamental to all humans. It was Levinson who published an article on the Guugu Yimithirr language spoken in Australia (1997). In the article, he described an interesting property of this language—its speakers do no use words for *left* or *right* because there are none in the language. Instead, they use cardinal directions. Levinson (1997, 100) uses the following example: if Guugu Yimithirr speakers wish to express that someone is standing *in front of a tree*, they will say that the person is standing *north of the tree* (or another cardinal direction, as appropriate). This way of using the so-called absolute directions in Guugu Yimithirr is different from the English or Czech way of using relative directions such as *left* or *right*. In order to be able to express themselves, speakers of Guugu Yimithirr need to constantly pay attention to cardinal points. Levinson concludes that this need to maintain a sense of direction means that "Whorfian effects are demonstrable in the spatial domain" (1997, 98).

There is another language spoken in Australia which uses absolute directions. The name of the language is Kuuk Thaayorre, and it was studied by Gaby. In her study (2012), she found out that English speakers think of time as going from left to right. On the other hand, Kuuk Thaayorre speakers put time on an east-to-west axis, which can be

ascribed by their use of absolute directions. This means that the language which is used to describe direction influences how speakers think about time.

Papafragou, Massey, and Gleitman looked at another aspect of direction and motion. In their study (2002), they compared how English and Greek speakers encode motion events. Using Talmy's terminology for encoding motion events (2009), they classified English as a satellite-framed language and Greek as a verb-framed language. One of the experiments in this study dealt with the key question of whether the different patterns for encoding motion events affect speakers' memory. In this experiment, English and Greek speakers were asked to verbally describe a motion scene; there was always either the path or the manner variation of the same scene. For example, for the path variation, a frog was jumping *into the room*, while in a second picture, a frog was jumping *out of the room* (2002, 200). Two days later, both groups of speakers were shown a picture and asked whether it was the same picture they had seen two days prior. As expected, English speakers used mostly verbs which encode manner of motion in the verb itself while describing motion scenes verbally, whereas Greek speakers mostly reached for verbs which encode path information. As for the second part of the experiment, it was expected that English speakers would remember the pictures with manner variation better, while Greek speakers would find it easier to recall the photos with path variation. However, this hypothesis was not validated. Both groups showed similar results, which means that there was no effect of language on the memory of speakers (2002, 202). This study which makes use of Talmy's terminology may resemble the study conducted by Ibarretxe-Antuñano and Filipović (2013) which dealt with translation of witness statements into Spanish. While Ibarretxe-Antuñano and Filipović uncovered some far-reaching consequences of the two different ways of encoding motion events, Papafragou et al. are quite sober in their conclusions. In fact, they state that their experiments did not prove anything which would support the idea of linguistic relativity. The different verbal descriptions of motion events by the two groups of speakers merely prove that "English speakers speak English and Greek speakers speak Greek" (2002, 216).

Deutscher who is interested in the topic concedes that there are more arguments which do not speak in favor of linguistic relativity when it comes to direction and motion. In his book, Deutscher mentions Pinker and his idea that it is the physical environment which determines the choice between the use of absolute directions and

relative directions, not the language (2010, 188). If people such as the speakers of Guugu Yimithirr live in an environment without any special points of reference, it may be more logical for them to use absolute directions rather than directions such as *left* and *right*. It could therefore be argued that it really is the environment which helps decide whether to use absolute or relative directions. As Levinson points out in his study, speakers of Guugu Yimithirr do have the expressions *left* and *right* even though they are only used for talking about body parts (1997, 104). If speakers of languages such as Guugu Yimithirr or Kuuk Thaayorre can grasp the concept of *left* and *right*, it can be assumed that English speakers can learn to use absolute directions and pay attention to what cardinal points they are facing.

It therefore appears that it is the physical environment which dictates what type of directions to use. A specific language might make its speakers think about space in a certain way because they do so habitually. Reasoning about direction and space is thus affected by language, but it is not an irreversible state. To rephrase, speakers of a language that uses relative directions think about the space in terms of *left* and *right*, but they can still develop a good sense of direction and start using absolute directions; language does not place constraints on speakers' awareness of their location in terms of cardinal points.

2.5   The Pirahã Language Controversy

In 2005, Everett published a paper which sparked a lot of interesting and controversial debates. In the paper (Everett 2005), he discusses the Pirahã language spoken in Brazil. He states that the Pirahã language and culture are unique because of, for example, the absence of numbers or a concept of counting and any terms for quantification, the absence of color terms, probably the simplest kinship system in the world, or the absence of any memory of more than two past generations (2005, 621). Everett suggests that their unusual culture may impose certain constraints on cognition. While he was living among the Pirahã in Brazil, he discovered that the speakers of Pirahã never talk about relatives who died before one was born; moreover, he had a hard time finding a speaker who would remember their grandparents' names (2005, 632). Everett talks about this phenomenon as the "immediacy of experience that constrains grammar and living" (2005, 633). The immediacy of experience principle goes against one of the properties of human languages defined by Hockett—displacement. Hockett describes displacement as "being able to talk about things that are remote in space or time (or

both) from where the talking goes on" (Hockett and Hockett 1960, 90). Everett basically argues that it is the culture which imposes constraints on grammar, which then affects cognition. In the case of Pirahã, their culture restricts their ability to talk about things distant in time or space, which in turn means that they cannot remember the names of their ancestors. Everett considers culture to be quite restrictive in terms of what can be expressed.

In his article, Everett also goes into detail regarding numbers and counting. At one point during Everett's stay among the Pirahã, the Pirahã expressed a wish to be taught to count and perform basic arithmetic operations in Portuguese. According to Everett, nobody was able to master the skills and learn to count to ten or even solve simple tasks such as adding 3+1 despite their enthusiasm to learn (2005, 626). While Everett explains this as culture affecting cognition, McWhorter retorts that the Pirahã struggle with mathematics because they do not need it in their culture; not vice versa: their culture does not prevent them from learning to count. Using McWhorter's own words, "an isolated hunter-gatherer culture has no need for a word for 116, or to do long division, or to speculate about the nature of zero" (McWhorter 2016, 15). Everett himself later admits that the Pirahã's motivation to attend the classes turned out to be "that it was fun to be together" (2005, 626). Therefore, it appears as it was the Pirahã's lack of motivation which made it impossible to teach them to count. McWhorter adds that counting is not a necessity no matter how important it may seem to us (2016, 15). Counting is therefore not fundamental for a tribe which lives in such an isolated part of Brazil.

Everett's area of interest ranges from numbers and counting to the alleged lack of embedding in Pirahã. Embedding can be defined as adding a clause into another clause. Where English speakers would embed a subordinate clause and say *I really watched the foreigner fishing*, the Pirahã would have to say *I watch the foreigner intently. He was pulling fish out by their mouths* (Everett 2005, 629). According to Everett, then, the Pirahã need to produce short sentences to express the same idea that English speakers would embed. Since Chomsky claims that recursive embedding is a property of natural languages (Hauser, Chomsky, and Fitch 2002, 1577), Everett's claim about the lack of embedding in Pirahã contradicts Chomsky's theory of Universal Grammar. As reported in an article by Colapinto (2007, 5), Chomsky rejects Everett's claims about the lack of embedding and confidently states that "there is no coherent alternative to UG." Thus, in

response to Everett's arguments, Chomsky says that the use of language can only be explained in terms of Universal Grammar. On the other hand, culture does not play an important role, which stands directly against Everett's idea that culture affects cognition. Everett's immediacy of experience principle means that communication is possible only with respect to the immediate reality, but Chomsky disagrees. He is rather adamant about his theory that all humans share the same language faculty, which in turn means that humans are capable of using language thanks to a shared deep structure. Nevertheless, it may be useful to mention that Chomsky's reasoning seems a bit circular at times. Chomsky basically says that the Pirahã language must have embedding because natural languages have the "capacity for recursive embedding of phrases within phrases" (Hauser, Chomsky, and Fitch 2002, 1577). The presence of embedding in natural languages is, however, a theory Chomsky himself developed. Chomsky therefore defends his theory of Universal Grammar by saying that there is no alternative to Universal Grammar.

Although Chomsky's rejection of Everett's assertions may seem hasty or even self-serving, it is necessary to say that Everett himself may have exaggerated certain claims about the Pirahã language and its uniqueness in comparison to other languages spoken around the world. For example, Nevins, Pesetsky, and Rodrigues (2009, 367) emphasize that even some languages such as German do not allow embedding in certain cases. To quote an example from the article by Nevins and his colleagues, English allows prenominal possessive noun phrases to be embedded with other possessive noun phrases, but German does not. Therefore, a phrase such as *Mary's brother's canoe has a hole* is perfectly acceptable in English, but the same structure would not be grammatically correct in German (2009, 364); nor in Czech, for that matter.

Although Everett might come across as a supporter of linguistic determinism, it could not be further away from the truth. Unlike Whorf, Everett does not argue that speakers perceive the world differently. Instead, Everett talks about speakers' expressing abilities, as is evident from the following quote from his article: "I am *not*, however, making a claim about Pirahã's conceptual abilities but about their expression of certain concepts linguistically, and this is a crucial difference" (2005, 634). So, language one speaks does not influence the way they understand the world; nevertheless, it may affect their ability to express certain concepts. The bottom line of Everett's research on the Pirahã is that both language and culture should be seen as

important elements. Unlike Chomsky, Everett does not believe that all languages follow the rules of the innate structure called Universal Grammar.

2.6 Gender

This subchapter will investigate the relationship between grammatical gender and thought. Grammatical gender can be defined as a way of classifying nouns. Sera et al. introduce the term *gender-loaded languages* (2002, 378). If a language is gender-loaded, it marks gender morphologically across several grammatical categories. If that is the case, then knowing the grammatical gender of nouns in a language is crucial for determining, for example, what form of inflection to use on adjectives to agree with the grammatical gender of a given noun:

(3) *Je to   moje   oblíben-á   barva.*
     is it   my-FEM   favorite-FEM   color-FEM
     'It's my favorite color.'

The example from Czech (3), which is a gender-loaded language, indicates that the pronoun as well as the adjective need to agree with the feminine noun *barva* (color). Czech speakers need to use the relevant suffix and the relevant form of the possessive pronoun to form grammatical sentences. Grammatical gender in Czech is therefore an obligatory feature.

However, it is not just the agreement with adjectives or pronouns; in some languages, grammatical gender can even distinguish meaning. Assigning a different gender to a noun could result in the change of meaning. For example, in French, feminine nouns *la livre* (pound) and *la tour* (tower) differ in meaning from their masculine counterparts *le livre* (book) and *le tour* (tour).

Languages also vary in how many grammatical gender categories they use. While French distinguishes two genders, masculine and feminine, Czech speakers have three gender categories at their disposal: masculine, feminine, and neuter. What is interesting is that the assigned gender often differs across languages. For example, *la table* (table) in French is feminine, but in Czech, *stůl* (table) is labeled as masculine.

Some languages such as English do not work with the concept of grammatical gender. Instead, they can use natural and metaphorical gender. Yule defines natural gender as a property of nouns "derived from a biological distinction between male and

female" (2010, 84). His example *Cathy is loved by her dog* shows the agreement between Cathy, a female entity, and her, which is the corresponding female pronoun reference (2010, 84). Natural gender can thus be defined as an inherent feature which is applied to animate nouns in English. In reference to gender in English, another point worth mentioning is the concept of *familiar* and *less familiar* animals (Conrad, Biber, and Leech 2002, 101). The former category entails animals that speakers can be somehow attached to and that they take a special interest in; for example, domesticated animals. When referring to the members of the familiar category, English speakers tend to use the pronouns *he* or *she*:

(4)   *My dog loves long walks. He is such as good boy.*

The latter category, *less familiar animals*, includes animals that are somewhat distant to speakers. Good examples of this category include spiders. When referring to the less familiar animals, the pronoun *it* will be used:

(5)   *There is a spider on the table. It is moving toward me.*

It is intriguing to know that Old English spoken before the 11th century did, in fact, apply the concept of grammatical gender. As Baugh and Cable summarized it in their book, grammatical gender in English ceased to be used during the Middle English period. In the present-day English, gender is determined by meaning, which means that only animate nouns express either masculine or feminine gender according to the gender of the individual, whereas all other nouns are neuter (2013, 11).

In English, metaphorical gender refers to the personification; that is, the use of *he* and *she* with inanimate nouns such as boats or planets. Veselovská states that the use of metaphorical gender in English is not too frequent and that it occurs mostly in poetic or figurative language (2019, 93). Nevertheless, it is possible to develop certain feelings for inanimate objects in the real world and refer to them using metaphorical gender. For instance, a boat may be important to its owner, so they might talk about it as *she*, alternatively *her*, as appropriate:

(6)   *This is my new boat. I call her Jenny.*

Finally, one more term relevant to this thesis is *conceptual gender*. As taken from Sato and Athanasopoulos, conceptual gender "concerns the conceptual properties of an object relating to either gender (e.g., conceptually male: *hammer* vs. conceptually female: *necklace*) which is not determined by linguistic or natural (i.e., biological) gender categories" (2018, 2). Therefore, conceptual gender refers to a noun's association such as being stereotypically perceived as male or female. This distinguishes conceptual gender from grammatical gender which arbitrarily classifies nouns as belonging to a certain formal category.

Having grammatical gender in a language raises an important question. Since the concept of grammatical gender is applied subconsciously every day when speakers need to refer to objects as masculine, feminine, or also neuter, can grammatical gender leave its mark and influence thought? It has been a topical issue in linguistics for several decades now. Does grammatical gender fit the idea of linguistic relativity and shape thought, or is linguistic universalism at play and grammatical gender does not hold sway over thought? In the next section, an overview of selected experiments related to the topic will be provided.

Probably the most famous proponent of the milder version of linguistic relativity is Boroditsky. Boroditsky, Schmidt, and Phillips designed an experiment in which speakers of Spanish and German—two languages that employ grammatical gender— were presented with a list of 24 object names which differed in grammatical gender. The participants' task was to provide three adjectives which best characterize the objects on the list *(Sex, Syntax, and Semantics* in Gentner and Goldin-Meadow 2003, 69). The interesting fact is that the experiment was conducted in English to find out whether participants would still subconsciously lean toward characteristics typically associated with feminine or masculine gender in their mother tongue. Boroditsky, Schmidt, and Phillips report that their hypothesis was confirmed, and speakers did indeed produce adjectives rated as masculine for grammatically masculine object names and adjectives rated as feminine for grammatically feminine object names. An example of such an object name is *key*, which is masculine in German but feminine in Spanish. German speakers reached for adjectives such as *heavy* or *jagged*; on the other hand, Spanish speakers described the word *key* as *lovely* or *tiny* (2003, 70). This experiment seems to indicate that grammatical gender in people's mother tongue affects how they think about objects.

In 2001, Flaherty conducted a similar experiment which involved assigning a typical male or female name to 20 objects depicted in pictures (2001, 22). This experiment was designed to compare English and Spanish speakers; however, unlike in Boroditsky's experiment, instructions were given in participants' mother tongue, not only in English. As predicted, Spanish participants picked a name which correlated with the grammatical gender of the given object name in Spanish. As Flaherty puts it, the findings show that if a language has a grammatical gender system, then "the gender creeps into perception" (2001, 18).

Boroditsky and Flaherty are not the only researchers who are interested in the relationship between gendered inanimate nouns and adjectives or names used to describe them. Williams et al. chose a different approach and looked into the corpora of German, Italian, Polish, Portuguese, Russian, and Spanish; all of them being gendered languages (2021, 139). Williams et al.'s experiment was not therefore conducted in a laboratory or in classroom settings, which brought a number of advantages. The benefits include the exploration of several languages at once as well as a larger sample size. Moreover, Williams et al. point out that laboratory experiments typically involve artificial settings, while looking at corpora involves exploring writers' natural choice of words (2021, 141). For the purposes of their experiment, the researchers extracted all May 2018 written samples from Wikipedia in all six languages. Afterwards, they calculated mutual statistical dependence between the inanimate nouns and adjectives which were used to describe them. The results revealed that there is "a statistically significant relationship between the grammatical genders of inanimate nouns and the adjectives used to describe those nouns for six different gendered languages" (2021, 151). This study therefore lends supports to other studies on the topic while using statistical methods and large sample sizes. The authors, however, caution that despite the statistically significant relationships, nothing about the nature of these relationships is known in this experiment. It means that the authors did not examine whether the relationships could be characterized by gender stereotypes or whether they were causal in nature (2021, 151).

Sera is another researcher interested in the relationship between gender and thought. In one of her studies, she aimed to find out how a voice assignment task correlates with gender in the participants' native language (Sera et al. 2002, 380). Sera et al. were concerned with two groups of participants—French and Spanish speakers.

These participants were told that a movie is being made in which objects come to life. Again, unlike in Boroditsky's experiment, the instructions were provided in participants' native language. The participants were then asked for help with assigning a man's or a woman's voice to each object. After that, the participants were shown pictures of the objects to eliminate the influence of explicit language as much as possible. As Sera et al. infer from the experiment, reliable differences were found between French and Spanish speakers on most the items which have a different grammatical gender in the two languages (2002, 382). In a way, the experiment brought mixed results because grammatical gender effects were slightly more frequent with pictures of naturally occurring objects rather than artificial objects. Sera et al. note that it is not clear why, but "for artifacts, only the items that were feminine in both languages and the items that were masculine in both languages were reliably different" (2002, 382). Interestingly enough, when Sera et al. conducted the same experiment with German speakers, German speakers' answers were not as consistent in terms of grammatical gender as was the case with French and Spanish speakers (2002, 387). Sera et al. explain that this could be caused either by the different gender systems in these three languages (unlike French and Spanish, German also employs neuter gender, which could possibly diminish the effects of feminine and masculine gender), but the authors also do not rule out the possibility that the inconsistent results could be attributed to nonlinguistic cultural differences (2002, 388).

Another study concerned with voice assignment to nouns comes from Norway. Beller et al. decided to look into Norwegian because there are more variants of the language, albeit mutually intelligible (2015, 335). This would provide a great opportunity to compare members of one cultural group speaking two language variants, one of the variants being gendered, the other one not. The method used in this experiment was based on Sara et al.'s 2002 experiment, but instead of showing pictures, participants were presented with words. One of the reasons for this was the fact that the authors of the study were interested in voice assignment to abstract notions such as *war* or *peace*, which would be too difficult to depict in pictures (2015, 338). Participants filled out an online survey in which they were asked to assign a male or a female voice to nouns from various categories such as animates, allegories, or artifacts. As predicted, speakers of the gendered variant of Norwegian perceived masculine nouns as more male in comparison to the speakers of the variant with no masculine or feminine gender. The

same could be said about the feminine nouns: they were perceived as more female by the speakers of the gendered variant of Norwegian. Nevertheless, certain words on the list, especially from the allegories category, did not reveal grammatical gender effects. According to the authors, it shows that some associations cannot be activated by grammatical gender; instead, one's culture may be at play (2015, 348). This study thus helps readers gain insight into the influence of culture. As noted by the authors of the study, culture can sometimes take over and diminish linguistic effects (2015, 348). Overall, the study finds that grammatical gender may impact thought; however, at the same time, culture should not be disregarded because it plays an important role in thinking about objects as well.

Boutonnet, Athanasopoulous, and Thierry conducted a study focused on object categorization (2012). Although this study was primarily concerned with Spanish-English bilinguals, there was also a control group consisting of English monolinguals. All instructions were given in English, and participants were presented with a triad of pictures and told to press a button if the third picture of the triad belonged to the same semantic category as the first two. The catch was that in half of the cases, the third picture was of a different grammatical gender in Spanish than the first two pictures in the triad, while in the remaining half of the cases, the third picture was of the same grammatical gender in Spanish. As the authors of the study explain, they opted for a triad of pictures rather than only two pictures because this was supposed to keep the participants' working memory occupied, which should have prevented them from figuring out the purpose of the study (2012, 74). The authors uncovered that there is a grammatical gender consistency effect in the Spanish-English bilinguals (2012, 76). Therefore, despite the task being of a semantic nature, the Spanish-English bilinguals unconsciously extracted grammatical gender information to solve the task. Boutonnet, Athanasopoulous, and Thierry arrived at the conclusion that "language interacts with other cognitive processes" (2012, 76), which corroborates the theory of linguistic relativity and its effects on thought, namely object categorization.

Sato and Athanasopoulous, one of the authors of the previous study, weigh in on the discussion with their research on English monolinguals and French-English bilinguals (2018, 222). As is the case with the previous study, this study consisted of a triad of images. The first two pictures in each triad were gender primes with a similar conceptual gender strength, while the third picture served as a target facial image.

Participants were instructed in English to decide as fast as possible for each triad whether the first two images made them think of the person in the third image. In this experiment, response times were of particular interest. The rationale behind this was the fact that participants' responses were highly subjective (2018, 223). The results showed that for French-English bilinguals, response times were faster if the triad displayed gender congruency; that is, if the grammatical gender of the first two pictures in the triad matched the biological gender of the third picture of the face. For example, if the first two pictures were *ear* and *ruler* (both of feminine grammatical gender in French) and the third picture was an image of a female face, then response times were faster in French speakers. English monolingual speakers did not show any such effects. The findings of this study suggest that speakers of a gender-loaded language such as French tend to rely on grammatical gender to make non-verbal categorical judgments (2018, 225). If the findings are correct, they speak in linguistic relativists' favor.

The influence of grammatical gender on cognition was also the subject of a study which compared Russian and Thai speakers' categorization strategies (Thongniam and Prasithrathsint 2020, 49). Participants were shown three black-and-white pictures of various objects. The first picture was an exemplar picture, and participants were supposed to indicate which of the two remaining pictures matched the exemplar picture. The hypothesis was that Russian speakers would group pictures together according to the grammatical gender, while Thai speakers would choose a picture which matched the exemplar's picture shape or size. For example, if the exemplar picture was a picture of an orange and the two remaining pictures were images of an apple and a banana, Russian speakers were expected to indicate that *banana* matches *orange* because these two words are both of masculine grammatical gender in Russian. On the other hand, it was predicted that Thai speakers, having no grammatical gender in Thai, would pick *apple* as a match because of its shape and size. The authors of the study took precautions to ensure that the hidden agenda behind the study would not be discovered. They achieved this by including a small number of sets of pictures which were similar in all aspects, that is, gender, size, and shape. For instance, an exemplar picture was *dog*, and the relevant choices in this set were *koala* and *cat*, all of them of a similar shape, small in size, and of feminine gender in Russian (2020, 52). This small set of pictures which were similar in all aspects was supposed to sidetrack the participants and prevent them from figuring out the real purpose of the experiment. Nevertheless, most

sets contained pictures which differed from the exemplar picture either in size and shape or grammatical gender in Russian. The results of the study confirmed the authors' hypothesis. In most cases, Russian speakers chose pictures which matched the grammatical gender of the exemplar picture in each set. Authors further conclude that grammatical gender can prompt Russian speakers to categorize objects according to grammatical gender, whereas Thai speakers with no grammatical gender in their language are free to group objects according to other criteria they find appropriate (2020, 54).

A unique study which dealt with the influence of grammatical gender on the perception of household odorants comes from Canadian speakers of French and English living in Montreal (White, Cunningham, and Zampini 2022). The authors emphasize that molecules obviously have no natural gender, which means that there must be something else which makes people evaluate odors as masculine or feminine (2022, 4). The question the authors want to address is whether this evaluation is based on stereotypical concepts of masculinity and femininity, or whether it is the grammatical gender of language which influences the evaluation. French and English appear to be good languages for comparison because one of them employs grammatical gender and the other one does not. As is the case with the Norwegian study by Beller et al. (2015), all participants in this study come from similar culture, having been the residents of Montreal, Canada. The participants were presented with 16 odorants which were labeled in English. Eight of these names differed in conceptual gender in English and grammatical gender in French, and the remaining eight names were of the same conceptual gender in English and grammatical gender in French. Furthermore, all testing was conducted in English so that the French participants were prevented from using grammatical gender. After participants smelled an odorant, they were asked to write down three adjective which best describe the smell. After that, they were supposed to explicitly rate the masculinity and femininity of the odorants. The adjectives were then rated as either masculine or feminine by five native English speakers who were unaware of the purpose of the study. The result analysis showed that both English and French speakers came up with adjectives which were consistent with the conceptual gender of the odorants. This was not predicted for the French speakers who were expected to produce adjectives tied to the names' grammatical gender in French. As for the masculinity and femininity explicit rating, it was hypothesized that French

grammatical gender would subconsciously affect the ratings and that the odorants which were of feminine gender in French would be rated as more feminine, whereas the odorants of masculine gender would be rated as more masculine by French participants. However, this hypothesis was disproved. The authors of the study come up with a plausible explanation and say that because all participants of the study live in the Montreal area, they share the same culture to a certain degree. As a result, "it is possible that the effect of culture was strong enough to hinder any possible effects of grammatical gender" (2022, 13). If this is the case, this Canadian study is consistent with the Norwegian study conducted by Beller et al. (2015), which discovered that one's culture may override grammatical gender influence.

Although quite a lot of studies have been conducted to examine the relationship between grammatical gender and thought, not all of them seem to be conclusive. While Boroditsky and her colleagues are mostly confident about the influence of grammatical gender on people's ideas about objects (Phillips and Boroditsky 2003, 932), other researchers are more careful in their conclusions. Some studies which seem to prove that language does shape thought may be task dependent. An example of such as study is Beller et al.'s study described earlier in this chapter. Grammatical gender did not influence Norwegian speakers as much when it came to categorizing allegorical items. Moreover, some studies have not found any evidence for linguistic relativity. This holds true for the study by White, Cunningham, and Zampini who decided to turn away from the ordinary research on grammatical gender and its influence on categorization of physical objects, and who instead focused their attention on speakers' categorization of odorants. In any case, to my knowledge, no experiments have been carried out with Czech speakers. In the next two chapters of this thesis, I will attempt to investigate and compare how English and Czech speakers categorize objects and characterize nouns when it comes to gender.

3   Object Categorization

I conducted two experiments, both of which were centered around the concept of gender in Czech and in English. As described in the previous chapter, English, unlike Czech, does not apply grammatical gender to nouns. It, however, works with the notion of conceptual gender.

3.1   Purpose

The first experiment aimed to investigate how native speakers of Czech, a language with grammatical gender, categorize objects in comparison to native speakers of English, a language without grammatical gender. This experiment is based on the 2002 study by Sera et al. (2002, 380) in which participants were assigning either a male or a female voice to objects in pictures. The hypothesis is that Czech grammatical gender should override conceptual gender. As a result, Czech speakers will be more likely to assign a male voice to objects with masculine grammatical gender in Czech, and vice versa; a female voice will be assigned to objects which are of feminine grammatical gender in Czech. As for the English native speakers, their choice of voice will depend on the associated conceptual gender of the objects. Also, the prediction is that items of Czech neuter gender will be congruent with the conceptual gender as is the case with English.

3.2   Materials

I created two questionnaires using Google Forms. One questionnaire was in Czech, the other one in English. Each questionnaire contained an introduction, general questions related to the participants' background, and two experiments. The questionnaires can be found attached in the Appendices. Communication with Czech participants was carried out in Czech, while communication with English participants was carried out in English. Certain researchers such as Boroditsky, Schmidt, and Phillips (2003, 69) prefer to give instructions in English even to non-English native speakers in order to investigate whether these participants would still subconsciously lean toward characteristics typically associated with feminine or masculine gender of nouns in their mother tongue. However, I decided to give Czech instructions to Czech participants because English instructions and tasks in English could possibly have been a limiting factor for participants who are not too proficient in English. Additionally, speakers who

do not speak English proficiently were more desirable for the purposes of this experiment because they were expected to turn to grammatical gender to solve the task.

The first experiment relied on a series of black and white pictures. The pictures were black and white to ensure that color did not interfere with the categorization procedure. Moreover, the pictures were as basic as possible, containing no text. Some of them were taken from the Bank of Standardized Stimuli (BOSS, Mathieu Brodeur), while others which were not available via BOSS were drawn following the same style by Soňa Pospíšilová.

The introductory text presented to participants was modeled according to the text which Sera et al. presented to their participants (2002, 381); the Czech version of the text can be found in Appendices:

> Imagine there is a movie being made in which some everyday objects
> come to life. Below you are going to see the pictures of these objects.
> Your task is to decide whether the objects should have a man's or a
> woman's voice in the movie.

Images of the stimuli included in this experiment can be found in the table below. The order of the items was alphabetical in English apart from *chainsaw* which was accidentally included as the eighth item; the Czech list followed the English order, exactly as seen in Table 1:

English Stimuli	Czech Stimuli	English Conceptual Gender	Czech Grammatical Gender
ax	sekera	male	feminine
baseball bat	baseballová pálka	male	feminine
car	auto	male	neuter
dumbbell	činka	male	feminine
flag	vlajka	female	feminine
hammer	kladivo	male	neuter
hard hat	ochranná přilba	male	feminine
chainsaw	motorová pila	male	feminine
lemon	citron	female	masculine
necklace	náhrdelník	female	masculine
necktie	kravata	male	feminine
orange	pomeranč	female	masculine
ring	prsten	female	masculine
screwdriver	šroubovák	male	masculine
teapot	čajová konvice	female	feminine
tulip	tulipán	female	masculine

Table 1: List of images and their corresponding English conceptual and Czech grammatical gender

The list of these items has been inspired by the list composed by Sato and Athanasopoulos (2018, 229). In their study, they created a list of object images deemed as having either a female, male, or neutral conceptual gender association. Also, several items from the list were borrowed from a study by White, Cunningham, and Zampini (2022, 7) who also generated a list of words associated with either male or female conceptual gender in English. Most items on the Experiment 1 list differed in gender. For example, where there was English male conceptual gender, the Czech grammatical gender of the same item was feminine. Examples include items such as *ax*, *baseball bat*, *dumbbell*, or *chainsaw*. Other items on the list such as *orange* or *ring* were of feminine conceptual gender in English but of masculine grammatical gender in Czech. The only pictures which shared the same English conceptual gender and Czech grammatical gender were *flag*, *screwdriver*, and *teapot*.

3.3 Procedure

Participants were asked to fill out a questionnaire. When they provided their sociodemographic details, they proceeded to the first experiment. As is the case with Sera et al.'s experiment, my participants were informed about a movie in which objects come to life. After that, participants scrolled down to see a series of pictures described in subchapter Materials. Participants' task was to pick one of the two options and assign either a man's or a woman's voice to the objects depicted in the pictures.

3.4 Participants

There were 25 English native speakers and 24 Czech native speakers who participated in the experiment.

Ten of the English native speakers were females, 13 were males, and 2 identified themselves as other. As for the age, 18 participants were aged from 19 to 44 years of age, and 7 participants chose their age range as 45+. Most participants were Canadians (15); other nationalities included Americans (8), Australian (1), and English (1). Twenty-four speakers indicated their mother tongue as English, but one participant also remarked on being a Hakka native speaker. All participants picked English as the language they use most frequently in their everyday communication. Another question concerned the knowledge of other languages at a fluent level. Participants chose as follows: none (22), French (1), American Sign Language (1), and Chinese, Dutch German (1).

As far as the Czech participants are concerned, 19 of them were females and 5 were males. As for the age, 19 participants were aged from 19 to 44 years of age, and only 5 participants indicated they were in the 45+ age group. All participants were of Czech nationality and all of them selected Czech as their native language. When asked about the language used most frequently in everyday communication, 23 participants selected Czech, but 1 participant wrote down both Czech and English equally. As for the fluent knowledge of other languages, the results were as follows: none (6), English (15), German (2), English as well as German and Russian (1).

3.5 Results

The data were obtained from questionnaires submitted online by 25 English speaking participants and 24 Czech speaking participants. The results of the questionnaire for English speaking participants are summarized in the table below:

No.	English Stimuli	English Conceptual Gender	Assigned a Man's Voice	Assigned a Woman' Voice
1	ax	male	22 (88%)	3 (12%)
2	baseball bat	male	19 (76%)	6 (24%)
3	car	male	11 (44%)	14 (56%)
4	dumbbell	male	17 (68%)	8 (32%)
5	flag	female	11 (44%)	14 (56%)
6	hammer	male	19 (76%)	6 (24%)
7	hard hat	male	21 (84%)	4 (16%)
8	chainsaw	male	21 (84%)	4 (16%)
9	lemon	female	4 (16%)	21 (84%)
10	necklace	female	2 (8%)	23 (92%)
11	necktie	male	18 (72%)	7 (28%)
12	orange	female	10 (40%)	15 (60%)
13	ring	female	3 (12%)	22 (88%)
14	screwdriver	male	20 (80%)	5 (20%)
15	teapot	female	2 (8%)	23 (92%)
16	tulip	female	6 (24%)	19 (76%)

Table 2: Object categorization results for English native speakers

The table above contains the number corresponding to the number of a given picture in the questionnaire (column 1), the list of English stimuli (column 2), their corresponding conceptual gender (column 3), the number of English native speakers who assigned a man's voice and the matching percentages in parentheses (column 4), and the number of

participants who assigned a woman's voice as well as the percentages in parentheses (column 5).

The dark highlighted rows represent items which were consistent with the hypothesis of this experiment. In these cases, participants picked the voice of the same conceptual gender (i.e., a man's voice for male conceptual gender and a woman's voice for female conceptual gender) with the percentage rate of 75% or more. The light highlighted rows represent items which were still consistent with the hypothesis but could have been a matter of chance due to the lower percentage rate. Only one item on the list was not in accordance with the English conceptual gender: *car*. *Car* was expected to be assigned a male voice, but the majority of participants opted for a woman's voice.

Although the results were generally consistent with the hypothesis for English native speakers, there were not any unanimous judgments. The two items on the list which received the highest percentage rate were *teapot* (92% of participants said this item should have a woman's voice) and also *necklace* (92% as well).

As far as the Czech speaking participants are concerned, results are summarized in the table below:

No.	Czech Stimuli	Czech Grammatical Gender	Assigned a Man's Voice	Assigned a Woman's Voice
1	sekera	feminine	15 (62.5%)	9 (37.5%)
2	baseballová pálka	feminine	15 (62.5%)	9 (37.5%)
3	auto	neuter	22 (91.7%)	2 (8.3%)
4	činka	feminine	14 (58.3%)	10 (41.7%)
5	vlajka	feminine	8 (33.3%)	16 (66.7%)
6	kladivo	neuter	20 (83.3%)	4 (16.7%)
7	ochranná přilba	feminine	14 (58.3%)	10 (41.7%)
8	motorová pila	feminine	13 (54.2%)	11 (45.8%)
9	citron	masculine	16 (66.7%)	8 (33.3%)
10	náhrdelník	masculine	2 (8.3%)	22 (91.7%)
11	kravata	feminine	15 (62.5%)	9 (37.5%)
12	pomeranč	masculine	14 (58.3%)	10 (41.7%)
13	prsten	masculine	10 (41.7%)	14 (58.3%)
14	šroubovák	masculine	23 (95.8%)	1 (4.2%)
15	čajová konvice	feminine	3 (12.5%)	21 (87.5%)
16	tulipán	masculine	7 (29.2%)	17 (70.8%)

Table 3: Object categorization results for Czech native speakers

The table above contains the number corresponding to the number of a given picture in the questionnaire (column 1), the list of Czech stimuli (column 2), their corresponding grammatical gender (column 3), the number of Czech native speakers who assigned a man's voice and the matching percentages in parentheses (column 4), and the number of participants who assigned a woman's voice and the corresponding percentages in parentheses (column 5).

In this table, there are only two items which were highlighted in a dark color. Only *šroubovák* (screwdriver) and *čajová konvice* (teapot) received the predicted voice consistent with Czech grammatical gender at a rate of 75% or higher. Other items, namely *vlajka* (flag), *citron* (lemon), and *pomeranč* (orange) were also in line with the hypothesis, but due to the lower percentages, it could have been a matter of chance. However, unlike with the English native speakers, most items in the table were not in accordance with the hypothesis; that is, Czech native speakers did not choose voices according to the grammatical gender. For example, *tulipán* (tulip) was expected to be assigned a man's voice, but only 7 out of 24 participants picked this option.

Two items on the list, *auto* (car) and *kladivo* (hammer) are of neuter gender in Czech; therefore, it was not clear which voice they would receive. While *kladivo* (hammer) was assigned a man's voice as in English, *auto* (car) was assigned a man's voice, which is different from English where most participants opted for a woman's voice.

It was hypothesized that *flag*, *screwdriver*, and *teapot* would be assigned the same voice in both languages, which was confirmed. Nonetheless, certain items should have been assigned different voices in the two languages, but they were not. The items are as follows: *ax, baseball bat, dumbbell, hard hat, chainsaw, necklace, necktie, ring, tulip*. A comparison of results for both groups of speakers can be found in the table attached on the following page. The items which are highlighted in pink are the ones which did not follow the hypothesis. As is evident from the table, most items were consistent with the hypothesis when it came to English native speakers, whereas for Czech native speakers, most items were assigned a different voice than expected. The two items highlighted in blue are the ones which are of neuter grammatical gender in Czech, which means that it was not apparent which voice they would be assigned. The bold items on the list are the ones which should have been assigned different voices in the two languages, but they did not. For example, *ax* was supposed to receive a male voice by English speakers but

a female voice by Czech speakers. Instead, Czech speakers chose a male voice just as English speakers did. In this case, then, speakers of both languages relied on conceptual gender.

No.	English Stimuli	English Conceptual Gender	English Speakers' Assigned Gender	Czech Stimuli	Czech Grammatical Gender	Czech Speakers' Assigned Gender
1	**ax**	male	male	**sekera**	feminine	male
2	**baseball bat**	male	male	**baseballová pálka**	feminine	male
3	car	male	female	auto	neuter	male
4	**dumbbell**	male	male	**činka**	feminine	male
5	flag	female	female	vlajka	feminine	female
6	hammer	male	male	kladivo	neuter	male
7	**hard hat**	male	male	**ochranná přilba**	feminine	male
8	**chainsaw**	male	male	**motorová pila**	feminine	male
9	lemon	female	female	citron	masculine	male
10	**necklace**	female	female	**náhrdelník**	masculine	female
11	**necktie**	male	male	**kravata**	feminine	male
12	orange	female	female	pomeranč	masculine	male
13	**ring**	female	female	**prsten**	masculine	female
14	screwdriver	male	male	šroubovák	masculine	male
15	teapot	female	female	čajová konvice	feminine	female
16	**tulip**	female	female	**tulipán**	masculine	female

Table 4: Comparison of results for both groups of speakers

To sum up, the only item which was not consistent with the hypothesis in the English questionnaire was *car*; on the other hand, in the Czech questionnaire, the items which were against the hypothesis were *sekera* (ax), *baseballová pálka* (baseball bat), *činka* (dumbbell), *ochranná přilba* (hard hat), *motorová pila* (chainsaw), *náhrdelník* (necklace), *kravata* (necktie), *prsten* (ring), *tulipán* (tulip). The hypothesis was therefore not confirmed, and it does not seem that Czech grammatical gender influenced the participants' perception of male and female features in inanimate objects.

4   Characterization of Nouns

4.1 Purpose

The second experiment was a replication of an experiment by Lera Boroditsky et al., as seen in Chapter 4 called *Sex, Syntax, and Semantics* (2003, 69). The aim of this experiment was to examine whether the different gender systems of English and Czech lead to different characterizations of nouns.

4.2 Materials

As for the materials for this experiment, a list of nouns was presented to participants. The English instructions on the form were phrased as follows (the Czech version can be found in Appendices):

> Below you will find a list of nouns. For each noun, please write down
>
> three adjectives that best describe the noun.

Just as in my previous experiment, the list of these items was partially taken from Sato and Athanasopoulos (2018, 229) and from White, Cunningham, and Zampini (2022, 7). The list of nouns was alphabetical in English; the list of nouns in Czech followed the English order. Most of the nouns selected for this experiment differed in gender. If a noun was of female conceptual gender in English, it was of masculine grammatical gender in Czech. The only nouns which shared the same gender in both languages (conceptual gender in English and grammatical gender in Czech) were *England* and *ship*. A list of nouns used for the purposes of this experiment is attached below:

English Nouns	Czech Nouns	English Conceptual Gender	Czech Grammatical Gender
Atlantic Ocean	Atlantický oceán	female	masculine
bullet	kulka	male	feminine
England	Anglie	female	feminine
honey	med	female	masculine
hurricane	hurikán	female	masculine
lawnmower	sekačka na trávu	male	feminine
Moon	Měsíc	female	masculine
onion	cibule	male	feminine
razor	břitva	male	feminine
sewing machine	šicí stroj	female	masculine
ship	loď	female	feminine
shovel	lopata	male	feminine
Titanic	Titanic	female	masculine
winter	zima	male	feminine

Table 5: List of nouns used for the noun characterization task with their corresponding English conceptual and Czech grammatical gender

4.3 Procedure

Immediately after completing Experiment 1, participants were presented with the list of nouns in the English alphabetical order, and for each noun, they were asked to assign three adjectives which came to their mind.

4.4 Participants

There were 25 English native speakers and 24 Czech native speakers who participated in the experiment. Since the participants were the same ones as in the first experiment, their sociodemographic details can be found in subchapter 3.4 Participants.

4.5 Results

As is the case with Experiment 1, the data were obtained from questionnaires submitted online by 25 English speaking participants and 24 Czech speaking participants. The analysis of the results uncovered that, on the whole, participants did not tend to reach for adjectives which could be defined as typically feminine or masculine. One of the few typically feminine adjectives found in the questionnaires could be the word *krásná* (beautiful) which was used by 3 Czech participants to describe *zima* (winter). Another Czech participant characterized *winter* as *nádherná* (gorgeous). Only 1 English speaking participant described *winter* as *beautiful*; on the other hand, another English participant called *winter romantic*. Nevertheless, *winter* was predominantly reported to be *studený* (cold) in Czech and *cold* in English. The same could be said about *the Atlantic Ocean* which was mostly described with general terms such as *cold*, *blue*, and *deep* in English and *studený* (cold), *modrý* (blue), and *hluboký* (deep) in Czech.

A noun characterized with what could be considered a typically feminine adjective is *ship*. Two Czech participants said that *ship* is *krásná* (beautiful), and 1 participant even used the adjective *okouzlující* (charming). None of these two adjectives appeared in the questionnaires for English speaking participants, however. In general, English native speakers had a tendency to describe *ship* using more technical terms. The adjective *buoyant* was used 8 times and the adjective *floating* 4 times. No equivalent to *buoyant* came up in the Czech questionnaires, but *plovoucí* (floating) was used 3 times and also the word *nízkoponorná* (shallow draft) appeared once.

When it comes to *Měsíc* (the Moon), Czech participants did not use any characteristically feminine or masculine adjectives. Instead, general adjectives such as *žlutý* (yellow) or *kulatý* (round) were written down most frequently. The English

equivalent *the Moon* was, however, characterized as *beautiful* 3 times, *romantic* twice, *pretty* once, and *gorgeous* once, which would be in line with the English female conceptual gender. Having said that, most English native speakers still reached for universal descriptive terms which are gender neutral such as *bright* or *round*.

Also, two Czech participants put down the word *dámský* (women's) to describe *šicí stroj* (sewing machine), and 1 English speaking participant used the adjective *feminine* to characterize the English equivalent *sewing machine*.

Apart from the examples quoted above, there were no distinct feminine or masculine adjectives used by the participants. What is worth mentioning is that *břitva* and the English equivalent *razor* were unanimously described as *ostrý* (sharp) in Czech and *sharp* in English. In other words, every single Czech participant wrote down *ostrá* (sharp) to characterize *břitva* (razor), and the same holds true for English native speakers—every single one of them described *razor* as *sharp*. By contrast, the adjectives used for *cibule* (onion) were slightly different in the two languages. English native speakers characterized *onion* as *layered* 7 times (plus two participants did not put down an adjective but used the noun *layers* twice), while only 1 Czech participant came up with the corresponding word *vrstevnatá* (layered). A plausible explanation could be the fact that the phrase *to dress like an onion* (meaning *to dress in layers in order to keep warm in winter*) can be frequently heard in Canada. This would indicate that the choice of the adjective *layered* is connected to culture.

5 Discussion

The aim of both experiments was to find out whether there is a difference between speakers of a language with grammatical gender and those who speak a language without grammatical gender in terms of their language use.

From the Experiment 1 results which were summarized in tables in Chapter 3, it appears that English speakers rely on conceptual gender when categorizing objects. The only exception was *car*, which went against the notion of conceptual gender and received a woman's voice instead. To my knowledge, most participants of the questionnaire live in Canada, which means that they share the same culture. It could be the reason why the questionnaire results are overall quite consistent.

As mentioned in Chapter 3, certain items were expected to be assigned different voices in English and Czech, but that was not the case. The list consists of these items: *ax, baseball bat, dumbbell, hard hat, chainsaw, necklace, necktie, ring, tulip*. While these items did not seem to confirm the hypothesis that Czech grammatical gender would take over, some items do appear to show the influence of grammatical gender to a certain degree. For example, *ax* was assigned a woman's voice by mere 3 English native speaker, but *sekera* (ax) received a woman's voice from 9 Czech native speakers, which is three times as many. A similar statement could be issued for *chainsaw*, which was marked as an object with a woman's voice by 4 English native speakers; however, the Czech equivalent *motorová pila* (chainsaw) was evaluated as an object with a woman's voice by 11 Czech native speakers. Perhaps, then, grammatical gender does interfere. On the other hand, both *necklace* and *náhrdelník* (necklace) were assigned a man's voice by only 2 participants in both languages, which would then go against the idea that grammatical gender plays a role in Czech, even if a small one. It could be the case that it is both grammatical gender and associations of individual participants which interplayed and helped solve the task. However, on the basis of this experiment's results, it can be said that Czech grammatical gender does not seem to play a critical role in the perception of male and female features.

When it comes to noun characterization, Experiment 2 did not reveal any significant statistical results. Firstly, most of the adjectives used by participants cannot be classified as typically masculine or feminine. Most of the adjectives collected in the questionnaires were gender neutral, general descriptive words; for instance, *deep* when

describing *the Atlantic Ocean* or *bright* when describing *the Moon* are gender neutral words. The second issue is that when participants did in fact use an adjective which could be marked as feminine, it was only a small number of participants. For example, only one English speaking participant described *sewing machine*, which is supposed to be a noun of female conceptual gender, as *feminine*. The remaining 24 English speaking participants put down gender neutral words. Also, only 4 adjectives which could be deemed typically feminine were used by Czech native speakers to characterize *zima* (winter), which is a word of feminine grammatical gender in Czech: *krásná* (beautiful) was used 3 times and *nádherná* (gorgeous) just once. This is not enough to draw any groundbreaking conclusions about different gender systems leading to different noun characterizations. While Boroditsky, Schmidt, and Phillips claim that the findings of their experiment "indicate that people's thinking about objects is influenced by the grammatical genders their native language assigns to objects' names" (2003, 70), my experiment did not allow any such conclusions. The findings of Experiment 2 concerning noun characterization are consistent with the experiment with German speakers by Sera et al. which did not reveal any influence of German grammatical gender on solving a task (2002, 387). The Experiment 2 results seem to suggest that with respect to assigning adjectives to objects, the key factor is not grammatical gender, but individual associations and culture. This would therefore make Experiment 2 results consistent with the findings by Beller et al. who stated that culture can override linguistic effects (2015, 348).

As Experiment 2 results did not confirm the previous experiment results by Boroditsky, Schmidt, and Phillips, we can refer to a phenomenon called the replication crisis. There are other researchers who attempted to reproduce noun characterization task results but failed to do so. For example, Mickan, Schiefke, and Stefanowitsch (2014) conducted an experiment based on the noun characterization experiment by Boroditsky, Schmidt, and Phillips (2003). Although subjects in the 2014 experiment were tested in their native languages (German and Spanish), their task was identical to the task in the 2003 experiment—when being presented with a noun, participants were asked to write down three adjectives that came to mind. The authors found out that the "differences in the male/female scores of adjectival responses to grammatically masculine and feminine nouns are very small and statistically non-significant" (Mickan, Schiefke, and Stefanowitsch 2014, 44). The authors further say that the 2003 results

"were either a statistical fluke or that they were due to some unreported aspect of their [Boroditsky et al.'s] procedure" (2014, 47). This may imply that language may not have such a great impact after all.

Moreover, it may be useful to point out that the results are task dependent. Experiment 1 which was based on object categorization and assigning a man's or a woman's voice to objects depicted in pictures showed that English speakers rely mostly on conceptual gender, while Czech grammatical gender does not play a crucial role in the same task. However, Experiment 2 which dealt with noun characterization did not uncover any significant effects for English speakers or Czech speakers. With some rare exceptions, neither English speakers nor Czech speakers were inclined to describe nouns with typically feminine or masculine adjectives congruent with the conceptual or grammatical gender in each language.

6   Conclusion

This diploma thesis addressed the question "Do languages shape the way we think?" The aim was to explore the notion of gender and compare English and Czech, two languages which employ different gender systems. This thesis started off with the examination of the relationship between language and thought. The next few subchapters looked into relevant theories and existing studies related to the research question. One theory known as linguistic universalism assumes that all languages share an underlying structure which is hardwired in our brain. Therefore, languages should not shape the way we think about the world. On the other hand, a theory known as linguistic relativity presumes that every language encodes different categories, which necessarily leads to differences in cognition. To find out which pattern English and Czech fit, two experiments were conducted.

Experiment 1 was an object categorization task in which participants were asked to assign either a man's or a woman's voice to black-and-white objects in pictures. The results seem to suggest that English speakers do in fact rely on conceptual gender when fulfilling this task. With one exception only, English native speakers categorized all pictures in accordance with the English conceptual gender. On the other hand, the results for Czech native speakers were inconsistent with Czech grammatical gender. For the most part, Czech native speakers opted for a different voice than expected. It seems to be the case, then, that not all languages with grammatical gender categorize objects solely based on the grammatical gender.

Experiment 2 lay in noun characterization. Participants were supposed to characterize a noun using three adjectives. This experiment did not show any significant results because most participants thought of adjectives which were gender neutral. Moreover, the small number of participants who did write down typically feminine adjectives were in the minority, so it is impossible to state that conceptual or grammatical gender play any crucial role when it comes to noun characterization.

The findings of the two experiments seem to indicate that whether or not languages affect our thought is task as well as culture dependent. The object categorization task brought conclusive results for English speakers only, while the noun characterization task did not demonstrate any important language effects for any group of the speakers. If any conclusions had to be drawn from the two experiments, it could

be said that language is part of thought, but it may not necessarily always shape it. It all depends on the task which participants are asked to solve. Overall, it might be individual associations and culture which interfere and play the key role.

7   Resumé

Tato diplomová práce se zabývala otázkou „Formují jazyky naše myšlení?" Cílem bylo prozkoumat jmenný rod a porovnat angličtinu s češtinou, tedy dva jazyky, z nichž každý používá jiný systém rodů. Tato diplomová práce začala zkoumáním vztahu mezi jazykem a myšlením. Několik dalších podkapitol se věnovalo relevantním teoriím a existujícím studiím, které se týkají výzkumné otázky. Jedna z teorií známá jako jazykový univerzalismus předpokládá, že všechny jazyky sdílí skrytou strukturu, která je pevně zakořeněná v našem mozku. Proto by jazyky neměly formovat způsob, jakým přemýšlíme o světě. Na druhé straně stojí teorie známá pod názvem jazykový relativismus, která má za to, že každý jazyk kóduje jiné kategorie, což nutně vede k rozdílům v kognici. Byly provedeny dva experimenty, aby se zjistilo, kterému vzorci odpovídají angličtina a čeština.

V experimentu č. 1 byla úkolem kategorizace předmětů, ve které byli účastníci požádáni, aby přiřadili buď mužský, nebo ženský hlas k černobílým předmětům na obrázcích. Zdá se, že výsledky naznačují, že se při plnění tohoto úkolu angličtí mluvčí skutečně spoléhají na konceptuální jmenný rod. Až na jednu výjimku angličtí rodilí mluvčí roztřídili veškeré obrázky v souladu s anglickým konceptuálním rodem. Naproti tomu výsledky českých rodilých mluvčích českému gramatickému rodu neodpovídaly. Z velké části volili čeští rodilí mluvčí jiný hlas, než se očekávalo. Vypadá to tedy tak, že ne všechny jazyky, které mají gramatický rod, kategorizují předměty výhradně na základě tohoto gramatického rodu.

Experiment č. 2 spočíval v popisu podstatných jmen. Účastníci měli popsat podstatné jméno pomocí tří přídavných jmen. Tento experiment neprokázal žádné významné výsledky, protože většina účastníků vymyslela přídavná jména, která byla neutrální, co se rodu týče. Navíc ten malý počet účastníků, který přece jen přišel s typicky femininním přídavným jménem, byl v menšině, takže je nemožné říct, že by konceptuální nebo gramatický rod hrál jakoukoliv zásadní roli, pokud jde o popis podstatných jmen.

Zjištění, která tyto dva experimenty přinesly, naznačují, že jestli jazyky ovlivňují naše myšlení závisí na tom, před jaký úkol jsou účastníci experimentů postaveni a jaké kultury jsou účastníci součástí. Kategorizace předmětů přinesla přesvědčivé výsledky pouze pro anglické mluvčí, zatímco popis podstatných jmen neprokázal žádné podstatné

účinky jazyka pro žádnou skupinu mluvčích. Kdyby se měly učinit závěry z těchto dvou experimentů, dalo by se říct, že jazyk je součástí myšlení, ale nemusí ho stále nutně formovat. Vše záleží na úkolu, který účastníci řeší. Celkově se může jednat spíše o asociace individuálních účastníků a kulturu, které zasahují a hrají klíčovou roli.

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10   Appendices

10.1 Appendix 1: Questionnaire in English

<u>Section 1</u>

Dear Participant,

My name is Silvie Pospisilova and I am a student at Palacký University Olomouc, Czech Republic. This questionnaire is a part of my Master's thesis and is intended for English native speakers. You will participate in two experiments which relate to language and thought.

Your responses are anonymous and filling out the entire questionnaire should take approximately 10 minutes.

Thank you for agreeing to participate in this study. If you have any questions regarding the survey, you can reach me at <u>language.and.thought@seznam.cz</u>

What gender do you identify as?
- o Male
- o Female
- o Other

How old are you?
- o Under 18
- o 19-44
- o 45+

What is your nationality?
- o Canadian
- o American
- o Czech
- o Other:

What is your mother tongue?

o English

o Czech

o Other:

What language do you use most frequently in your everyday communication?

o Czech

o English

o Other:

What other languages (apart from your mother tongue) are you capable of speaking fluently; i.e., what other languages are you proficient or highly proficient in?

o None

o French

o Other:

Section 2

Experiment 1

Imagine there is a movie being made in which some everyday objects come to life. Below you are going to see the pictures of these objects. Your task is to decide whether the objects should have a man's or a woman's voice in the movie.

Section 3

Experiment 2

Below you will find a list of nouns. For each noun, please write down three adjectives that best describe the noun.

Atlantic Ocean, bullet, England, honey, hurricane, lawnmower, Moon, onion, razor, sewing machine, ship, shovel, Titanic, winter

10.2 Appendix 2: Questionnaire in Czech

Sekce 1

Vážený účastníku,

jmenuji se Silvie Pospíšilová a jsem studentkou Univerzity Palackého v Olomouci. Tento dotazník je součástí mé magisterské práce a je určen pro české rodilé mluvčí. Zúčastníte se dvou experimentů, které se týkají vztahu jazyka a myšlení.

Vaše odpovědi jsou anonymní a vyplnění dotazníku si vyžádá přibližně 10 minut.

Děkuji, že souhlasíte s účastí v této studii. Pokud máte jakékoliv otázky ohledně průzkumu, neváhejte mě kontaktovat emailem na adrese language.and.thought@seznam.cz

Jaké je Vaše pohlaví?
- o Muž
- o Žena
- o Jiné

Do jaké věkové skupiny patříte?
- o Pod 18 let
- o 19-44 let
- o 45+

Jaké jste národnosti?
- o České
- o Kanadské
- o Americké
- o Jiné:

Jaký je Váš rodný jazyk?
- o Čeština
- o Angličtina
- o Jiný:

Jaký jazyk nejčastěji používáte v každodenní komunikaci?

    o Češtinu

    o Angličtinu

    o Jiný:

Jaké jiné jazyky kromě Vašeho rodného jazyka ovládáte plynule, tedy na pokročilé nebo velmi pokročilé úrovni (úroveň B2-C2)?

    o Žádné

    o Angličtinu

    o Němčinu

    o Ostatní:

Sekce 2

Experiment 1

Představte si, že se natáčí film, ve kterém ožívají běžné předměty. Níže uvidíte obrázky s těmito předměty. Vašim úkolem bude rozhodnout, jestli by tyto předměty měly ve filmu hovořit mužským, nebo ženským hlasem.

Sekce 3

Experiment 2

Níže najdete seznam podstatných jmen. Ke každému podstatnému jménu napište tři přídavná jména, která dané podstatné jméno vystihují nejlépe.

Atlantický oceán, kulka, Anglie, med, hurikán, sekačka na trávu, Měsíc, cibule, břitva, šicí stroj, loď, lopata, Titanic, zima

10.3 Appendix 3: Pictures for Experiment 1 – Object Categorization
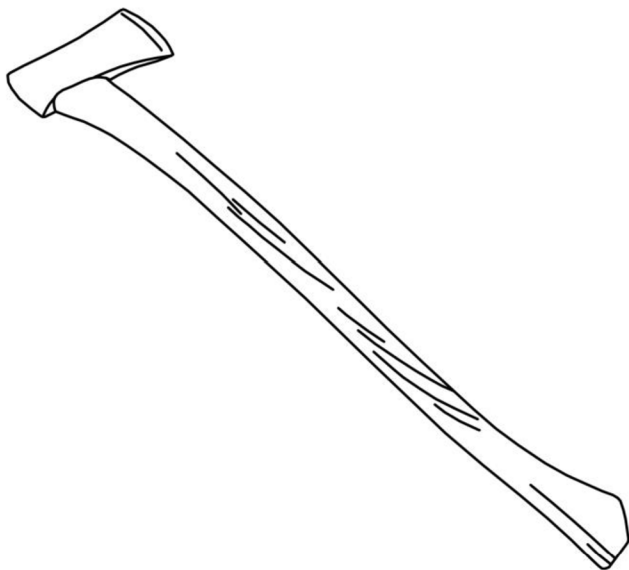
Picture 1: Ax. Sekera.

Source: BOSS
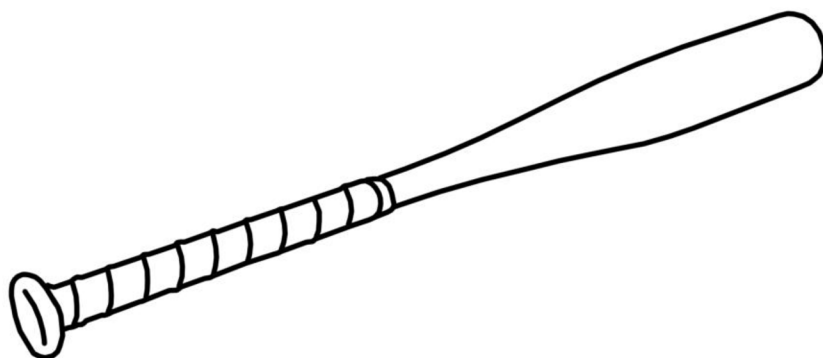
Picture 2: Baseball bat. Baseballová pálka.

Source: BOSS
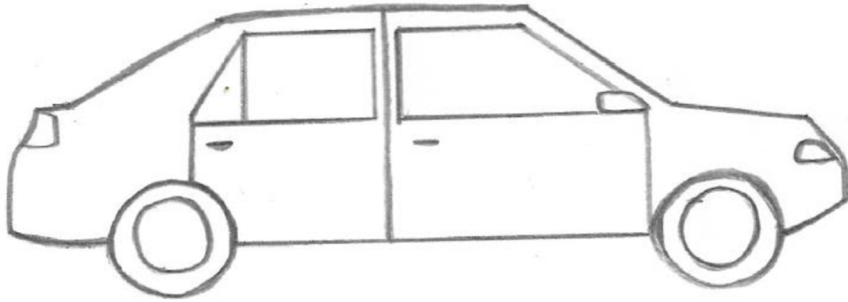
Picture 3: Car. Auto.

Source: Soňa Pospíšilová
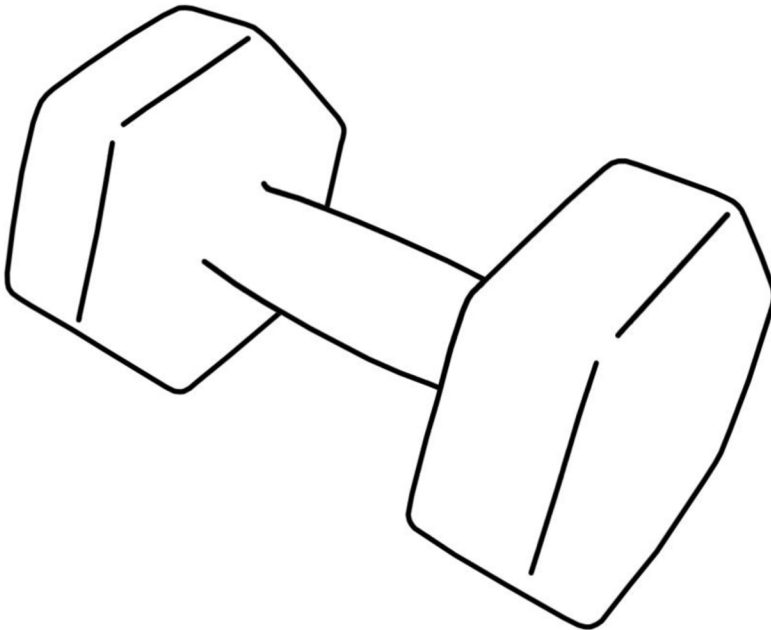
Picture 4: Dumbbell. Činka.

Source: BOSS
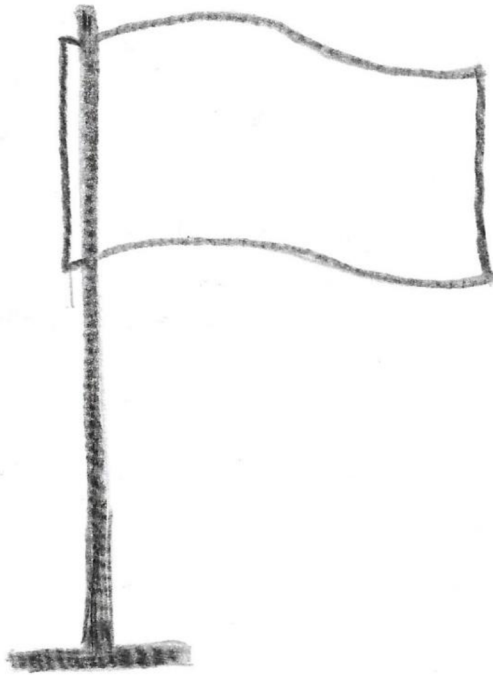
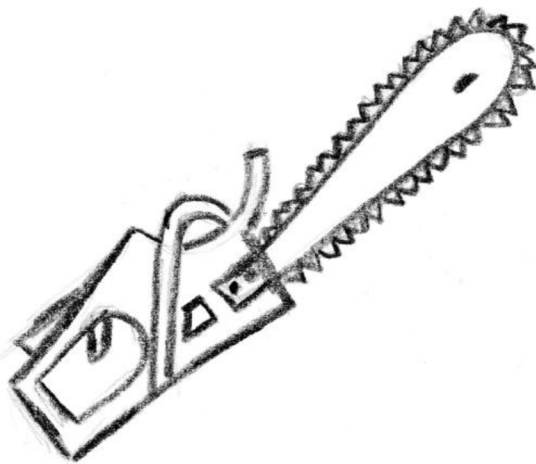Picture 5: Flag. Vlajka.

Source: Soňa Pospíšilová
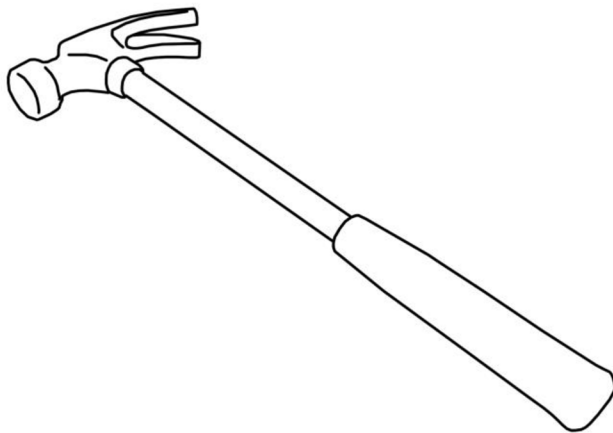
Picture 6: Hammer. Kladivo.

Source: BOSS
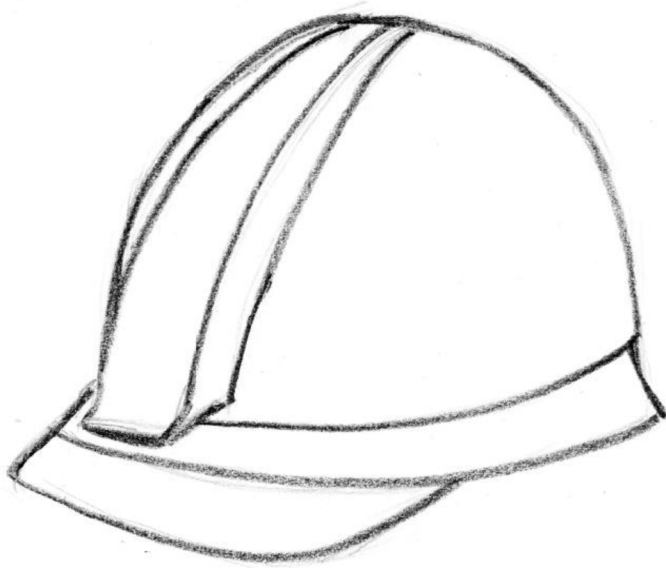
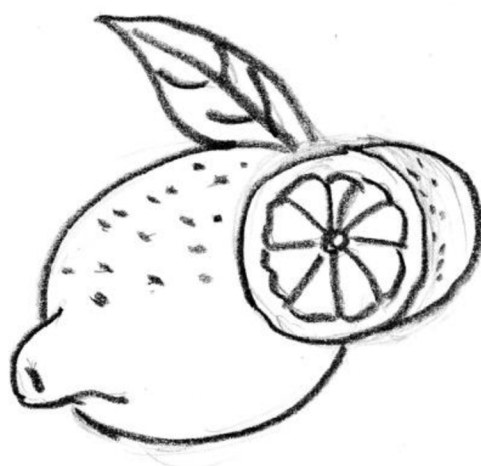Picture 7: Hard hat. Ochranná přilba.

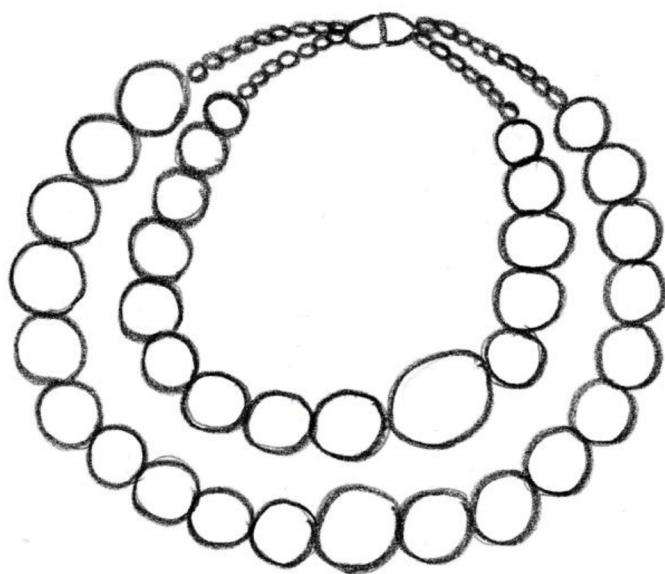Source: Soňa Pospíšilová
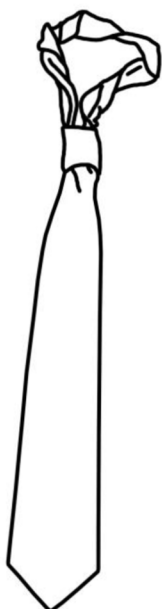

Picture 8: Chainsaw. Motorová pila.

Source: Soňa Pospíšilová
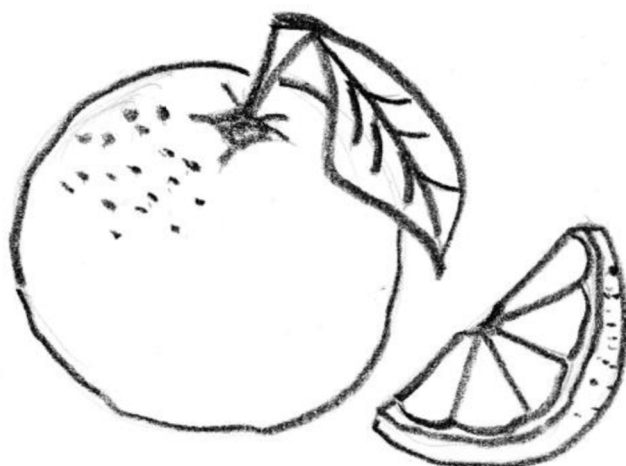
Picture 9: Lemon. Citron.

Source: Soňa Pospíšilová

Picture 10: Necklace. Náhrdelník.

Source: Soňa Pospíšilová
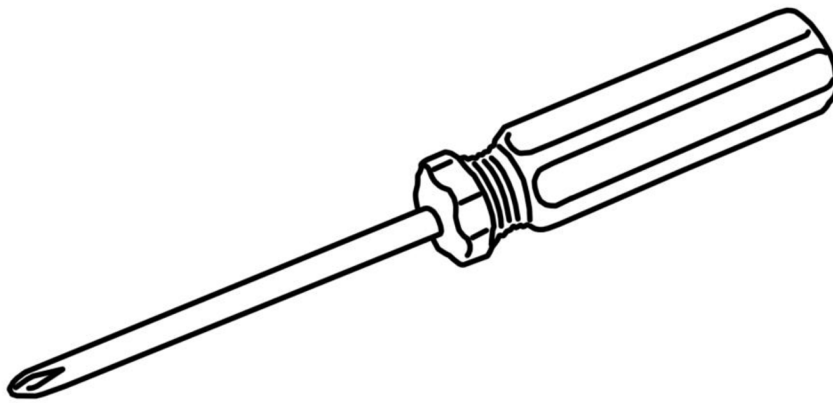
Picture 11: Necktie. Kravata.

Source: BOSS

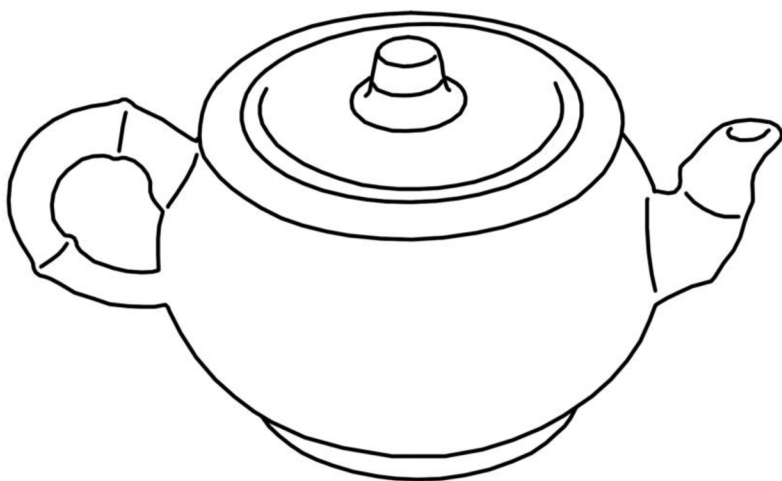Picture 12: Orange. Pomeranč.

Source: Soňa Pospíšilová

Picture 13: Ring. Prsten.

Source: Soňa Pospíšilová

Picture 14: Screwdriver. Šroubovák.

Source: BOSS

Picture 15: Teapot. Čajová konvice.

Source: BOSS

Picture 16: Tulip. Tulipán.

Source: Soňa Pospíšilová