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Pinker's Dilemma: Why linguistic relativity is neither false in principle nor trivial

Bachelor's thesis

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TARTU 2013

TABLE OF CONTENTS

Introduction

In this essay I will show that while Steven Pinker's (1994, Chapter 3: 65-66, 73-81) arguments against linguistic relativism provide a strong case for the implausiblity of a strict version of linguistic determinism, they fail to counter the Sapir-Whorf hypothesis in another, more plausible, formulation. Furthermore, I will show that Pinker's interpretation of what Benjamin Whorf, the originator of the Sapir-Whorf hypothesis, took to be linguistic relativity is incorrect. To a first approximation, linguistic relativity is the thesis that *the features of one's language systematically influence how one perceives and conceptualizes the world*. Linguistic determinism is the thesis that *for each language, there is a certain range of thoughts the person who speaks it can think, and that range is different for different languages*. Pinker handles the issue of linguistic relativity with a strictly either-or approach: either language determines thought completely or the changes in thought that have been caused by language can be disregarded as trivial. Pinker has two main arguments against linguistic relativity. Firstly, there is the empirical argument that experimental results support the existence of only a very trivial type of linguistic relativity. Secondly, there is the theoretical argument that the way the mind works – supposedly, through a language of thought that all who have the ability to learn a language possess - in principle undermines the notion that the language one speaks has any systematic effect on one's thinking. Pinker argues for a computational theory of mind (henceforth CTM) the workings of which I will explain fully later. Accoring to CTM, the mind performs calculations on a language of thought which is distinct from any natural language. He argues that if CTM is correct, then linguistic relativism is false.

I will give an overview of Pinker's exegesis of Whorf's writings and show that, contrary to Pinker's assumptions, Whorf did not subscribe to linguistic determinism. Furthermore, I will argue that each horn of Pinker's dilemma is based on a flawed argument. I will argue that the theoretical argument is flawed because in order for it to show that linguistic relativism is not possible, one needs to adopt a particularly strong form of CTM. But, using arguments provided by Fodor (2002), I will show that no such form of the representational theory of the mind is defensible. Given the strictly computational nature of how a computer processes information, Pinker's account of how the human mind works cannot be right. Then, I will show that if one appeals to a weak form of CTM, there can, in principle, be variations in thinking based on differences in natural language and therefore, linguistic relativity is compatible with the existence of the language of thought. Lastly, I will address Pinker's empirical argument by presenting an example of an experiment performed by psychologist Lera Boroditsky that shows that distinct features of different languages can have a substantial influence on one's competence to perform a cognitive task.

The discussion will proceed as follows. In section 1, I will introduce two definitions of linguistic relativity and identify how each is addressed by Whorf and Pinker. The first definition concerns purported differences in cognitive abilities that derive from differences in languages spoken. The second definition is that spoken language determines the range of thoughts one can think. As mentioned already, the latter is also known as linguistic determinism. I will show that Pinker and Whorf both grant the efficacy of the first one to at least some extent, whereas neither endorses the second one. In section 2, I will give an overview of Pinker's account of how the mind works and his theoretical objection against linguistic relativity. In subsection 2.1, I will describe the Language of Thought Hypothesis that Pinker subscribes to. In subsection 2.2, I will describe some of the motivations behind believing in the existence of the language of thought. In subsection 2.3, I will describe the Turing machine-like information processors that, in Pinker's view, work within the medium of the language of thought. In section 3, I will explicate Pinker's theoretical argument against linguistic relativity, that is, that the characteristics of how the mind works allow for a refutation of the notion that language can affect thought. In section 4, I will give an account of Pinker's exegesis of Whorf. I will show that the type of linguistic relativity that Pinker grants

is compatible with examples of linguistic relativity that Whorf also acknowledges and, furthermore, that Whorf never subscribed to the definition of linguistic relativity that Pinker attributes to him, calling the question of linguistic relativity "the Whorfian question" (Pinker 1994: 78). In section 5, I will describe the compatibility of CTM and linguistic relativity. In subsection 5.1, I will define the strong and weak version of CTM and show that in the account of how the mind works that Pinker endorses when he argues against linguistic relativity, Pinker adheres to the strong version. In subsection 5.2, I will elaborate on Fodor's critique of the strong version of the CTM, and show how it simultaneously is a critique of Pinker's theoretical argument against linguistic relativity. In subsection 5.3, I will elaborate on Fodor's statements regarding how there is no clash between the existence of the language of thought and variations in thought based on linguistic differences. Finally, in section 6, I will address Pinker's empirical argument by showing that the type of linguistic relativity that Pinker grants can cause substantial variation in one's cognitive abilities.

1. The definition of linguistic relativity

Linguistic relativity is the thesis that the syntactic structure and lexicon of one's language systematically influence how one perceives and conceptualizes the world (Swoyer 2003). For example, some languages categorize nouns into male and female genders. In German, the word "death" ("Tod") is male, whereas in Russian, "death" ("смерть") is a female noun. Correspondingly, in artistic depictions, Germans tend to paint death as male, and Russians tend to paint it as female (Boroditsky 2009). This has been taken to suggest that native speakers of German and native speakers of Russian seem to, in a sense, have substantially different ways to think about things in their environment due to corresponding semantic differences in the languages they speak.

The first approximation of linguistic relativity with which we have been working is slightly inadequate. There appear to be several distinct linguistic relativity theses, of which I will describe two. The first one is as follows:

Linguistic relativity$_1$: There are differences in one's cognitive competence to carry out some task which is based upon what language(s) one can speak.

This would mean, for example, differences in the mind's ability to work with cognitive mechanisms such as mnemonic chunking, memorizing and categorizing types of object based on what designations one's language's lexicon has. The results of many experiments support that notion. For instance, Russians linguistically differentiate light blue (синий) and dark blue (голубой). As such, they are also more likely to categorize objects of these two shades into those two categorizations, rather than just blue, and thus retain better memory of which shade of blue the objects had due to them being more precisely categorized (Boroditsky *et al.* 2007).

To illustrate the contrast, imagine a speaker of Russian and a speaker of English going to a shop to buy a patternless blue carpet. The selection of carpets is huge, and there are seven carpets that pique their interest, four of which are light blue, and three are dark blue. They do not know which one to choose, so they leave the shop and later discuss which one to buy. Based on linguistic difference, in the normal case, the Russian speaker would have automatically categorized each carpet into light blue and dark blue according to its shade, whereas the English speaker would not have done so. Accordingly, the Russian speaker would, based on this factor, be likely to have grouped the selection of carpets into two categories: one consisting of four light blue carpets and the other one of three dark blue carpets. Since it is easier to remember each object in a category of three or four objects than it is to remember each object in a category of seven objects, the Russian speaker would be better able to correctly visualize each of the seven carpets and retain memory regarding what they were like. Hence, he would also be better able to compare them in his head and thus in this particular example have a sort of cognitive advantage over the English speaker. This is an instance of linguistic relativity$_1$.

Alternatively, there is a stronger, more extreme notion of linguistic relativity. It states that people's thoughts are in principle determined by the categories made available by the natural language(s) they speak. According to this view, there is a sense in which language completely determines how we think (Swoyer 2003). Hence, this second definition of linguistic relativity can be stated thus:

Linguistic relativity$_2$: *Differences in languages entail differences in the possibilities of what one can think.*

Accordingly, language is an enabler of thought: which thoughts one can think depends on the expressions one knows.

According to linguistic determinism, there is a one-to-one correspondence between a concept that a human mind can think and an expression in language. Hence, each concept that a human mind can conceive corresponds with an expression in language. So when one thinks of any concept, there must be an expression in language that corresponds to it. Considering

that each language has its own set of expressions that is distinct from that of other languages, it follows that so are the concepts that are expressable in any one language different from those of other languages. In other words, different languages enable one to express propositions that are different from the propositions of other languages, since the expressions are different. Hence, speakers of different languages by default think different thoughts.

Next I will describe the theoretical aspect of the discussion. In the theoretical argument, Pinker states that linguistic relativity$_2$, which he attributes to Whorf (Pinker 1994: 57), is false. However, in order to do that, he first gives a description of his account of how the mind works.

2. Pinker's account of how the mind works

Pinker argues for a computational theory of mind (henceforth CTM) the workings of which I will explain fully later. According to CTM, the mind performs calculations on a language of thought which is distinct from any natural language. He argues that if CTM is correct, then linguistic relativism$_2$ is false.

Pinker's theoretical argument has two main parts, each of which supposedly undermines the notion that language has influence on thought. First, he takes all thought to be conducted through a private language of thought (henceforth LOT), which he calls mentalese. He describes mentalese as an internal system of representation that uses symbols to represent concepts and arrangements according to some consistent scheme (Pinker 1994: 78). To think is to deduce new sentences from old ones through computation. (Pinker 1994: 73-74) Second, the physical medium of a human brain consists of a series of information processors that use certain consistent patterns of computation. These machines work analogously to a Turing machine. "By looking at how a Turing machine works, we can get a grasp of what it would mean for a human mind to think in mentalese as opposed to English." (Pinker 1994: 73) Thus he compares the reasoning ability of a human mind to the computing ability of a Turing machine. In this section, I will describe both assumptions and how Pinker presents each as a factor that in principle renders linguistic relativity$_2$ false.

2.1 Pinker's account of how the mind works: the language of thought

2.1.1 Pinker's account of how the mind works: the language of thought - a general description

The Language of Thought Hypothesis (henceforth LOTH) claims that all thought takes place within a universal private language. Here I mean universal in the sense that any concept that a human mind thinks is thought within the medium of the language of thought (henceforth LOT). This language has several traits.

Firstly, it consists of a system of mental representations. Each mental representation within the system is a tokening of some corresponding thought. These mental representations, and hence, the corresponding thoughts, constitute the objects of propositional attitudes. Mental processes consist of causal sequences of the mental representations. Hence, mental processes consist of causal sequences of mental representations that are the tokenings of thoughts (Ayede 2010).

Secondly, the LOT has the characteristic of compositionality. That is, the meaning of each complex expression is composed of the meanings of its parts. The mental representations of the LOT have a combinatorial semantics and combinatorial syntax. An analogy can be drawn with natural language. In natural language, each sentence consists of individual parts, such as 'Jason', 'loathes' and 'mice'. Each of these parts is a syntactic component that combines to form a sentence. The syntax consists of the rules of the representational system. These rules determine what combinations of words are sentences and how sentences are formed. The string of words that a sentence consists of qualifies as a sentence only if these rules are obeyed. For example, 'loathes Jason mice' is syntactically incorrect because it disobeys the rules of the syntax. What is understood by the sentence (i.e. the proposition that James loathes mice) is referred to as the meaning. The rules that give the mental representations meaning, the semantic rules, shadow syntactic composition rules. Firstly, the individual syntactic components, such as 'James' and 'mice', each have a meaning of their own, that the semantic rules place upon them. Secondly, the semantic rules enable what is understood by 'James',

'loathes' and 'mice' to combine to form a whole sentence with a new semantic meaning. Hence, a full sentence is a syntactic combination, in that it is well-formed according to the syntactic rules of the representational system, and also a semantic one in that its parts combine to form a whole sentence with a new semantic meaning (Hutchinson 2002).

2.1.2 Pinker's account of how the mind works: the language of thought - reasons for believing in the existence of a language of thought

There are several reasons for assuming that there is a language of thought. Jerry Fodor, the originator of the LOTH, in his article, 'Defending the "Language of Thought"' (1990), posits several reasons for believing that cognitive states - and not only their intentional objects – typically have constituent structure, as is the case according to the LOTH. Also, Pinker (1994: 73) refers to several experiments that suggest the existence of different forms of pre-linguistic thinking and adopts the LOTH as an account that offers an explanation for them. In order to show that the LOTH is plausible to a considerable extent, I will describe one of Fodor's arguments and the experiments that Pinker referred to.

A system that has compositionality, such as LOT, also has to be able to generate sentences in accordance with the features of systematicity and productivity. LOTH is the only coherent theory that can account for the productivity and systematicity of mental abilities. (Fodor 1990: 292) Systematicity is the property that a system has if the structure of the objects it uses adhere to definite and predictable patterns. When constructing sentences within a coherent language, one adheres to such patterns. An example of systematicity is that if someone can think the thought 'I love mice', then by virtue of knowing how to use a construction in which the object of one noun phrase is in a relation of loving with the object of another noun phrase, one can also think 'Mice love me'. Therefore, linguistic capabilities have a certain property by virtue of the fact that natural languages have a combinatorial semantics. Fodor maintains that as language is the expression of thoughts and language is systematic, thought must have this property as well, therefore thought must have a combinatorial semantics as well. (Fodor 1990: 295) Productivity is a representational system's unbounded

ability to generate new representations from a given set of symbols. For example, if a language includes a number of nouns – say, the nouns A, B and C - and the construction "is a father of", then connecting those, one can produce a sentence as long as he likes with them. *E.g.* A is a father of B is a father of C is a father of A *ad infinitum*. One can create an infinitely long sentence in LOT just as one can produce an infinitely long thought. It is by virtue of there being a LOT that, Fodor maintains, thought has this characteristic.

Pinker provides a further justification for positing the existence of a LOT: he infers that there are several types of thinking that do not require the knowledge of a natural language and, as a means of having some way to account for them, he adopts the LOTH as an approach that provides a relatively clear answer to the question of how thoughts can be processed within the mind without the aid of a natural language: through an internal system of representation.

He refers to several experiments that show that "images, numbers, kinship relations, or logic can be represented in the brain without being couched in words"(Pinker 1994: 73). One such experiment showed that five-month-old babies can do a simple form of arithmetic. In the experiment, the experimenter displays an object to a baby, then occludes the object with an opaque screen. When the screen is removed, if the same object is present, the babies look for a little while, then lose interest. But if two or three objects have ended up there, the babies, reacting to the change in quantity, stare longer. The fact that they they react differently according to the difference in quantity suggests that they have acknowledged the difference in their minds without even having the notation of numbers. Therefore a person does not need to have learnt any numbers to make simple computations whose explicit stating would require the knowledge of a notation of numbers.

Results from another experiment strongly suggests that monkeys are aware of kinship relations. In the experiment, the experimenters hid a loudspeaker behind a bush and played tapes of a two-year-old monkey screaming. The females in the area reacted by looking at the mother of the infant who had been recorded. That suggests that they not only recognized the infant by its scream but recalled who its mother was. With reference to both this experiment and the prior one, Pinker assumes that there must have been some sort of medium through which the thinking occurred. That would be the LOT, which provides the interface, within which thinking occurs.

2.2 Pinker's account of how the mind works: information processors

According to Pinker's account, while LOT is the interface or the medium within which thinking occurs, the mind also consists of an unspecified number of apparati that carry out the thinking: information processors. An information processor utilizes mental representations within the system of a LOT. This constitutes the carrying out of certain kinds of cognitive ability.

Pinker states that processors have two necessary features: (*(1) The representations that one posits in the mind have to be arrangements of symbols,* and *(2) the processor has to be a device with a fixed set of reflexes* (Pinker 1994: 78). That is, the data that the processors handle are interpreted by the processors as token symbols within a system of internal symbolic representation. A reflex is a rule within the mechanisms of the processor that regulates how the input gets processed. This fixed set of reflexes can therefore be said to be the series of rules that govern how the processor works through the symbols.

According to Pinker, a processor utilizes cognitive abilities unique to humans, such as, for instance, basic rules of inference like: „Socrates is mortal" can be derived from „Socrates is a man" and „Every man is mortal". The information processor has the function of responding appropriately to the syntax of the mental representations (Pinker 1994: 74). What makes this processor smart is the exact correspondence between the syntax of the mental representations and the meanings of mental representations. This allows the rules of the processor to be also sensitive to the semantic relations between mental representations and thus allows it to derive valid inferences.

Each information processor has only one specific function. So each information processor in itself is extremely limited, due to which the human mind needs a multitude of them in order to think as effectively as it does:

> The way the elements in the processor are wired up would cause them to sense and copy pieces of a representation, and to produce new representations, in a way that mimics the rules of reasoning. With many thousands of representations and a set of somewhat more sophisticated processors (perhaps different kinds of representations and processors for different kinds of thinking), you might have a genuinely intelligent brain or computer. (Pinker 1994: 77)

So then, a person's mind is constituted by a series of different sorts of interrelating representation processors that each serve a specific function. The nature of the relation between these processors is left unspecified. Regardless, all thoughts in the mind are conducted through a combination of responses from these processors, by the central processor that manipulates the sub-processors, each corresponding to some certain type of thinking. The mental representations obey the rules that the fixed reflexes carry out on them. Since each processor operates in a way that is equivalent to logical reasoning, they always derive the correct outcome. For example, if one thinks whether or not to go and have lunch in an adjacent restaurant, he will weigh the costs and benefits of doing so: how many pressing duties he has, whether they are pressing enough to postpone his lunch, when will he next have the chance to have a meal, whether not having a meal for the next several hours will break his work flow *etc*. Each of these considerations is worked through by some processor or another in the mind to arrive at a conclusion regarding what is the best form of conduct, corresponding to which the system of mentalese then gives the physical body the right orders to carry out.

3. Steven Pinker's theoretical argument against linguistic relativity

In this section, I will present an outline of the assumptions and inferences of Pinker's theoretical argument against linguistic relativity and then describe each step. Pinker's theoretical argument against linguistic relativity can be broken down as follows:

(1.) Linguistic relativity is the thesis that natural language determines the thoughts one can think. (assumption)

(2.) Only the LOT and the information processors it runs determine the thoughts one can think. (assumption)

(3.) Natural language cannot be the LOT, because it lacks features that a LOT must have (*e.g.* accounting for co-referring words). (assumption)

(4.) The way the LOT works cannot be influenced by natural language. (assumption)

(5.) The way information processors carry out functions cannot be influenced by language, because to them, language is only a form of input. (assumption)

(6.) Natural language cannot determine the thoughts one can think. (inference from (2.) to (5.))

(7.) Linguistic relativity is false. (inference from (1.) and (6.))

Let's go through this more slowly. Firstly, he assumes that when addressing what Whorf took to be linguistic relativity, the only variant that is to be tackled is linguistic relativity$_2$ (Pinker 1994: 78). Secondly, Pinker presents an exhaustive account of what determines the thoughts that a human can think: Pinker assumes that only the LOT and the information processors that are run within the medium of the LOT, both of which are described in section 2, determine the thoughts one can think. Thirdly, in accordance with the assumption of the existence of the LOT and information processors, Pinker rephrases the question of whether there is such a thing as linguistic relativity thus: are English sentences able to embody the

information that a processor would need to perform valid sequences of reasoning (Pinker 1994: 78)?

The answer is a clear no, as English cannot be used as the medium of thought processes. He gives several strong examples of how linguistic determinism cannot be correct in the form of examples of features of the English language, of which I will describe three:

(1) English, has lexical ambiguity: several mutually exclusive thoughts can correspond to the same word. The word "bat*"* can refer to the black flying mammals that we know them as, or as a "bat" that one swings when playing baseball. Within the English language, these concepts are denoted with the exact same syntactic object, so the language offers no way to distinguish between them. A human mind, on the other hand, can distinguish between them, so the medium of thoughts must have a distinct symbol to denote either object.

(2) The English language includes co-referring expressions: the same object can be referred to in different ways according to context. One could call the same object of reference "that blonde bloke", "him" or "Leonardo DiCaprio" depending on what is suitable to the context. This is an issue for linguistic determinism because if each denotation corresponds to a specific exclusive concept, then a human mind could not be able to acknowledge the sameness of the objects of these denotations.

(3) Pinker also introduces as an example the existence of words whose semantic significance depends on the context, such as the articles "a" and "the". The difference between "ate a sandwich" and "ate the sandwich" is that the first refers to an object that had not so far been referred to in that context, whereas in the the second one, the object had already been referred to before or is salient in the context. Outside of particular conversation or text, however, the words "a" and "the" are meaningless and cannot be accounted for solely through linguistic thinking. Thus, given the context-dependent meaning of those words, there could be no specific concepts that they refer to. Hence, one could not ascribe these words the appropriate meanings by referring only to the medium of the English language. The medium of thoughts would have to be able to ascribe the right meaning to these words in the contexts they appear in.

As per step (4.) of the theoretical argument, Pinker also assumes that one's natural language cannot influence the LOT: The LOT is pre-linguistic and has the ability to convey all

thought; due to the way it works, it is unaffected by the process of learning or using a language. Language itself is therefore merely a tool for translating one's mentalese thoughts for others. The LOT is '*the mind's lingua franca*', which conveys the traffic of information that takes place between mental processors. (Pinker 1997: 90) Translating a phrase from one language to another means translating it from one's LOT to another's LOT, wherefore natural language cannot have consequential effects on the mind, since the mechanisms that govern it are pre-linguistically determined. (Pinker 1994: 82)

As per step (5.), neither can natural language affect the workings of the information processors, since to them, language is merely input. Any communication that is done from one mind to another will involve thinking through the information processors whose functions are innately specified. That means that the types of utterance that people will use to communicate are nothing but the output of fixed reasoning mechanisms, so differences in the languages used to express the utterances cannot in principle cause differences in how one thinks. (*ibid.*: 77)

From the described assumptions and inferences, Pinker infers that there is no way that natural language can influence thought (step (6.)). Accordingly, linguistic relativity$_2$ is false (step (7.)). In what follows, I will first argue against Pinker's assumption that the definition of linguistic relativity that he attacks is ascribable to Whorf. Then, in the subsequent section, I will argue against steps (4.) and (5.). After that, I will address Pinker's empirical argument.

4. Pinker's exegesis of Whorf

Pinker argues that Whorf is wrong on the ground that linguistic determinism is incorrect. On the one hand, Pinker is right to criticize Whorf for his style of argumentation: his taking instances of how speakers of different languages speak differently as evidence in itself that these different people think differently as well (Pinker 1994: 61). Indeed, Whorf analyzed languages and inferred that there were corresponding cognitive differences between the different speakers. On the other hand, Pinker's subsequent conclusion that Whorf adhered to linguistic relativity$_2$ is problematic. In this section, I will elaborate on both points.

Whorf primarily stresses the claim that language shapes perception by creating ways of thinking that are in a sense obligatory (Whorf 1940). Hence, there is a connection between the lexicon and grammatical features of a language and the perceptual capabilities of the person speaking the language. Different people observe the same things in different ways. Among Whorf's better-known examples of what he takes to be instances of linguistic relativity are such wherein an indigenous language has several terms for a concept that is only described with one word in English and other European languages (Whorf 1942: 184). For instance, the Algonquin languages have four pronouns instead of three, as they have two third persons. For example, calling these he$_1$ and he$_2$, one could say „*He$_1$ said that he$_2$ didn't know whose apple it was, but he$_1$ ate it anyway.*" or „*He$_1$ said that he$_1$ didn't know whose apple it was, but he$_1$ ate it anyway.*" Secondly, in the language Chichewa, spoken by a tribe in East Africa, there are two past tenses: one for past events with present result or influence – such as a person having lit a cigarette that he is currently still smoking -, the other for past events without present influence – a person having lit a cigar that had been discarded before the conversation in which the lighting of the cigarette is discussed. Therefore, a past as recorded in external situations is distinguished from a past recorded only in the psyche or memory. Whorf provides a number of examples: "*I came$_1$ here; I went$_2$ there; he was$_2$ sick, he died$_1$; Christ died$_2$, on the cross; God created$_1$ the world. "I ate$_1$," means I am not hungry, whereas "I ate$_2$," means I am hungry.*" Such a categorization of how to denote past tense verbs allows for more specificity than most languages. Hence the language of the speakers of Chichewa enables them to be more concise in contexts where most languages would not allow that.

With such examples, Whorf attempts to show that speakers of different languages perceive events differently, with reference only to differences in language. However, this only proves that there is a difference in how able they are to communicate in some certain contexts. As Pinker states (Pinker 1994: 61), this does not prove that there is a difference in how they think about or perceive the world.

Nevertheless, even though Whorf took linguistic differences to constitute cognitive differences, it does not follow that Whorf followed linguistic determinism, that is, that he took language to be the sole determining factor of thought. By providing examples that show that natural language cannot be the LOT, Pinker assumes that he has proven the implausibility of linguistic relativity in general. However, Whorf did not adhere to linguistic determinism in the sense of what Pinker is refuting.

Firstly, while Whorf does claim that language affects thinking to a significant extent, stating that thinking itself is conducted through a language, he does not force this constraint upon all thinking. In Whorf's view, while language is a system that can be used as a mediator of thoughts, it does not exclude other forms of thinking (Whorf (Carroll; Ed.); 1956: pp. 212–214). Indeed, his analyzing several languages and inferring from that that these languages represent different types of reality in itself indicates that he did not support linguistic determinism. That would render metalinguistic reflection and comparison of different types of linguistics impossible, since tasks like those require the ability to attribute several meanings to the same word and discern which one is used in some utterance. For example, Whorf would not have had the ability to denote and explain the concept of there being a cause_1 and cause_2 in another language in which they are not distinguished, such as English.

Secondly, he takes the field of mathematics to be 'a special kind of language' and music to be a 'quasi-language' (Whorf LMR: 170), so he uses the term more liberally than contemporary linguistic discussions would allow. As for linguistic determinism, Whorf states:

> "thinking in a language" does not necessarily have to use words . … . Much thinking never brings in words at all, but manipulates whole paradigms, word-classes, and such grammatical orders "behind" or "above" the focus of personal consciousness . (Whorf 1942: 173)

If "thinking in a language" does not require words, it indicates one can, according to Whorf, "think in a language" without having any specific denotations or lexical categories. By acknowledging some sort of ability to think in a way that requires no words, but still modifies the ways in which one can convey thoughts using language, Whorf showed that he adheres to a type of linguistic relativity that allows for changes in language that are caused by thinking that is not explicitly linguistic. However, Pinker attributes to Whorf linguistic relativity$_2$, which requires all thinking to be explicitly linguistic, that is, exhaustively expressible through and corresponding with some expression in language. Whorf describes a view of language that is certainly incompatible with that which Pinker refers to as linguistic determinism.

5. Objections to Pinker's theoretical argument

In this section, I will argue against Pinker's theoretical argument in two steps. Given Pinker's account of how the mind works, allowing for linguistic relativity would have to mean one of two things. It would either mean that there can be variation within the workings of the information processors, but that cannot be, because the information processors are strictly computational. Alternatively, it would have to mean that there can be variations within the workings of the LOT, which Pinker also disregards, given its universality (Pinker 1994: 82).

In addition to the linguistic relativity debate, Pinker is also involved in a debate regarding the computational nature of the mind. In what follows, I will show that what Pinker has said regarding the latter debate is incompatible with what he claims to be the reason why language cannot affect thinking. In subsection 5.1, I will describe what differentiates the weak and the strong version of CTM and show that Pinker appeals to the strong version when arguing against linguistic relativity$_2$. In subsection 5.2, I will state Fodor's counterarguments against the strong version of CTM. In subsection 5.3, I will show how even if Pinker subscribed to the weak version of CTM, that is, even if he appealed only to the existence of the LOT as the underminer of the notion that language affects thinking, there is no reason to disregard it.

5.1. Objections to Pinker's theoretical argument: The strong and weak versions of the Computational Theory of the Mind

A central aspect of Pinker's account is that he adheres to the Computational Theory of the Mind. A strong and a weak version of CTM can be distinguished. The strong version states that thinking *is* computation. It is an account of thinking in which reasoning is performed only by reference to the syntax of the mental representations. Conversely, the weak version states that not necessarily all aspects of thinking need to be computational. (Fodor 2002: 6-7)

In the Language Instinct (1994), Pinker argues that thinking is carried out by the innately determined information processors and that reasoning is a form of computation. In explaining

how the mind works, Pinker uses the example of a Turing machine, as a computational operator that can, in principle, solve any problem. „*By looking at how a Turing machine works, we can get a grasp of what it would mean for a human mind to think in mentalese as opposed to English.*" (Pinker 1994: 73) Likewise, a mind supposedly thinks in a way that is similar to a machine working through computations. Pinker's argument that all language does is present an output to all that the mind creates before speaking would be sound, provided the mind indeed works as a Turing machine does. The processors within a human mind identify language merely as input, not something that can cause changes in the workings of neither the information processors nor mentalese, that is, the interface of the processors.

Provided that reasoning is computation in the manner described above, natural language would indeed not be able to influence the workings of the information processors (step (5.) of the theoretical argument). At the same time, such an account would require adherence to a strong version of CTM. Next I will describe why adopting the strong version of CTM is problematic.

5.2. Objections to Pinker's theoretical argument: Problems with the strong version of the Computational theory of the Mind

In Fodor's elaborate criticism of a strictly computational theory of the mind in The Mind Doesn't Work That Way (2002), he uses as its example, like Pinker does in The Language Instinct (1994), the Turing machine. Conversely to how Pinker uses it, Fodor uses it to show that the human mind does not work like a computer. There are a number of issues with the strong version of the CTM.

If the mind reasons analogously to a Turing machine, its causal relations would have to be syntactically determined one way or another. Fodor gives two readings of the idea that cognitive processes are causal only if they are syntactic. The first is that the syntax of a mental representation must be essential to it. That is, the mental representation cannot survive syntactic alteration. The system would have to rely solely on syntactical properties to identify

mental representations: it is only if the sufficient conditions for an inference to be truth preserving are syntactic, that is, fixated only with reference to its shape, that a machine is able to recognize its validity. (Fodor 2001: 13) Syntactic properties are essential to enable the system to identify mental representations as the kind of mental representations that they are, so they are at least partial determinants of causal processes within the system. The problem is whether they are suffcient to determine the causal role of the mental representation. The mind would have to work along the lines of one of two alternatives: a version of CTM in which case the mental representations' syntactic structure does not reflect context-dependent features of thinking such as simplicity. Or alternatively, a version of CTM in which case the mental representations' syntactic structure does reflect such features. In what follows, I will state these two versions and explain why Fodor thinks that each does not work.

The first version, which Fodor calls E(CTM), is commited to what Fodor calls Principle E: "Only the essential features of a mental representation can determine its causal role in a mental life" (2001: 24). In E(CTM), the mental representations are context invariant. The mental representations that the mind operates with are syntactically determined, *i.e.* fixed as essential parts of thinking that cannot change according to varying influences that use heuristic thinking.

Fodor refers to simplicity (Fodor 2001: 25) and centrality (Fodor 2001: 34) of theories as properties to which mental processes are sensitive. The problem with E(CTM) lies in accounting for simplicity and other context-dependent features of actual human thoughts that change how a person regards some theory. Simplicity does not depend on the constituent syntax of the representation, but on its relation to other representations. Hence, the essential parts of a mental representation remain unaltered unlike in human thinking, given that some form of CTM applies to human cognition.

For example, take the example that someone has taken my blender from my flat without my consent. I discover that the blender is gone and have a theory, according to which my brother Tõnis took it. If I found evidence that he was abroad for the time I had been away from the flat, that would severely complicate the theory, presumably enough to make me abandon it. If I were determined to commit to my theory and start revising it in light of the evidence that he was abroad, I would have to assume that he has supernatural powers, such as

teleportation, which must have enabled him to teleport himself next to the blender and then back abroad, or telekinesis, which he must have used to make the blender fly itself to where he is. Evidence of my brother's whereabouts would not, however, affect the theory that my flatmate is the one who actually took the blender. Hence, a thought, a mental representation, such as "Tõnis was in Latvia for the time I was away from the flat" could cause complete revision of several beliefs and even the rejection of the theory itself. But when introduced into another theory, that mental representation may cause no change in one's beliefs at all. Therefore, the change that the mental representation causes in one's beliefs is not an inherent property of that mental representation, but rather it depends on how the mental representation fits into the corresponding theories that are relevant to it. Since a mental representation can change corresponding to the theory that it is fit into, it is sensitive to alteration. So, unlike human thinking, this account of how the mind works cannot account for context-sensitive features of mental representations. Therefore, E(CTM) cannot be a proper account of how the human mind works.

Alternatively, Fodor considers what he calls the Minimal Computational Theory of the Mind or M(CTM), in which case the role of a mental representation in cognitive processes need only supervene on some syntactic facts or other (Fodor 2001: 29). So then, the results of heuristic assessments such as simplicity that are to play a causal role in mental processes have to be syntactically determined. Hence, in contrast with E(CTM), the identity of a mental representation depends on the identities of other mental representations within the system. A consequence of this, Fodor argues, is that one must subscribe to the problematic notion of semantic holism (Fodor 2001: 33).

Accordingly, there is the issue of globality. M(CTM) allows for abductive inferences, that is, inferences about non-mental objects, to be computations. Hence, abductive inferences are exhaustively syntactically driven. (Fodor 2001: 33) If one assumes that such inferences are syntactically driven, then they must address global features of belief systems. Therefore, one must commit oneself to semantic holism. That is, the syntactically governed units of thought within the mind of a thinker must create relations with global properties in their entirety. The units of thought would have to be much bigger than they could in fact possibly be. However, that cannot be the case, as theories have the context-sensitive characteristic of centrality: theories are unequally epistemically committed to their various entailments. (Fodor 2001: 34)

Fodor brings the example that freely falling bodies generally accelerate in proportion to their weight. Physicists used to suppose that that is an absolutely fixed constraint of mechanics. Now that there has been a shift from weight-centered to mass-centered mechanics, the centrality of the notion that weight and acceleration are proportional has changed. The estimates of the effect of weight on acceleration can vary, whereas the estimates of the relations between mass and effort has become essential. Hence, relative to its place in the theory, the meaning of the proposition "weight and acceleration are proportional" has changed.

Provided he follows the computational model, causal relations in Pinker's system are syntactically fixed in some way or another. Each new unit of information is interpreted by the corresponding processors, but there is no proper explanation as to how this system can synthesize and relate the information in a proper way. Either he adheres to E(CTM), in which case the the mental representations are syntactically fixed, wherefore they could not account for context-sensitive features of thoughts such as simplicity. Or alternatively, he adheres to the M(CTM), in which case the relations between the mental representations and the theories they are commited to are syntactically fixed. So these mental representations would have to be able to be in a relation with theories in their full globally defined forms. Neither version of the account according to which reasoning is computation can be a proper account of thinking, therefore Pinker's argument that the way in which the mind works categorically undermines linguistic relativity is unsound as well.

In his reply to Fodor, Pinker responds by stating that he never said the mind works that way (Pinker 2005: 1). He denies having defended the view that "'minds are "input-output equivalent" to Turing machines'" (ibid., 7). However, that is precisely what he appeals to in step (5.) of his theoretical argument, *i.e.*, his assumption that natural language cannot affect the workings of the information processors. If Pinker subscribes to a weaker version of CTM, then the information processors cannot be completely innately specified, but rather the way they work would be sensitive to influences based on which of them are employed and in what manner in a given context.

5.3 Objections to Pinker's theoretical argument: Why the existence of a language of thought cannot be used as an argument against linguistic relativity

In this subsection, I will argue that even granted that all thoughts are couched in a universal medium of thought, that is, that thinking works according to a computational model of a sort, there is no reason to give up on linguistic relativity in general. Pinker states that the assumption of the existence of the LOT allows one to ask whether there is such a thing as linguistic relativity in a „satisfyingly precise way" (Pinker 1994: 67), namely, whether natural language can *be* the LOT. Given that he finds that a sufficient reason to dismiss linguistic relativity$_2$, he also appears to assume that how the LOT works cannot be influencd by language. However, Jerry Fodor, the creator of the LOTH, in his book, The Language of Thought (1975) expresses a different view.

Like Pinker, Fodor also endorses a version of the Computational Theory of the Mind, according to which the mind is governed by the LOT. But unlike Pinker, in The Language of Thought (1975), Fodor argues that natural language does have a substantial effect on thinking. The bits of language that a child has learnt play a direct role in further language acquisition. (Fodor 1975: 90) Fodor provides the example of using a dictionary. One asks a dictionary about some word one does not understand, and the dictionary tells one, in one's own language, what the word means. Thus a person uses one part of one's language to learn another part. Furthermore, as the adult can do it by consulting a dictionary, so should the child be able to do it by the consulting the corpus of language that he had learnt thus far (*ibid.*). Accordingly, the bits of language one has learnt influence further acquisition of the same language.

For every predicate in the natural language, it must be possible to express a coextensive predicate in the LOT. However, Fodor contends, from that it does not follow that for every natural language predicate that can be entertained, employed, thought of within the mind, there is an entertainable predicate of the LOT. (Fodor 1990: 91) An entertainable predicate is one that a person has the ability to immediately conceive of and employ in some situation, thanks to it being expressible in the natural language he speaks. While, given the universal nature of the LOT, it is in principle possible for any user of the LOT to employ any kinds of thoughts that another user of the LOT has the ability to employ, the characteristics of a spoken natural

language determine which kind of thoughts actually get employed. Thus, a natural language provides the means to conveniently convey concepts of extreme sophistication and complexity, as short-hand manifestations of concepts that are already implicitly contained within the LOT.

Accordingly, Fodor concludes, there is no clash between the existence of the LOT and Whorf’s notion that what kinds of concepts become manifest in the minds of the speakers of some natural language is, to an extent, profoundly determined by the particular characteristics of the natural language that one speaks. Contrary to Pinker's assumption (5) (see section 3), the informational processors are sensitive to change caused by external factors such as language.

6. Pinker's empirical argument: The triviality of linguistic relativity

In this section, I will describe and argue against Pinker's accusation that linguistic relativity is trivial. Pinker (1994: 65) grants that some version of linguistic relativity has been experimentally proven to exist, but this he writes off as proof for a "banal, "weak" version of the hypothesis". He acknowledges that words have an observable effect on memory and categorization, as (1) subjects in psychological experiments where they have to memorize objects by color show slightly better memory for colors that have readily available names in their language and (2) in experiments where subjects are asked to categorize colors, the fashion in which they do so tends to correspond with what words they have for those colors in their languages. These qualify as examples of linguistic relativity$_1$, wherein language affects competence to carry out some cognitive task.

True enough, this shows that language affects thinking in some way, but Pinker asks:

> So what? It is hardly an example of incommensurable world views, or of concepts that are nameless and therefore unimaginable, or of dissecting nature along lines laid down by our native languages according to terms that are absolutely obligatory. (Pinker 1994: 66)

Within this quote, the term 'absolutely obligatory' is an allusion to Whorf, who stated that the terms that a language allows one to think in, are, within the language, obligatory (Whorf 1940).

I would like to state two things: Firstly, unlike Pinker's conclusion, that there is a sense in which the terms a language contains are, in certain cases, obligatory to its speakers. Secondly, differences in language can, in certain cases, have a significant effect on cognition. That is, the differences in language that imply differences in thinking as per linguistic relativity$_1$ should not be brushed off as trivial. I will present an example of an instance of linguistic relativity from an experiment performed by psychologist Lera Boroditsky, with which I would like to argue for both statements.

In Pormpuraaw, a remote Aboriginal community in Australia, the indigenous languages do not have the relative terms "left" and "right." Unlike speakers of most languages, they stick to using absolute compass terms (*e.g.* "There's an ant on your southwest leg.", "Please place the cup on the north-northeast part of the table."). Consequently, the speakers of the said languages have extraordinary orientation skills, being able to discern and point out directions at any time of the day almost instantaneously. To say hello in Pormpuraaw, one asks, 'Where are you going?", and an appropriate response might be, "A long way to the south-southwest (or any other relevant cardinal direction). How about you?" If one does not know which way is which, he literally cannot get past hello. (Boroditsky 2010)

The Australian aborigines could always tell which direction is which, so the question would be banal to them: it would be the same as asking „Which way is up?". Also, when putting objects in line, they do it not from left to right, right to left or up to down, but from east to west. So, based on a difference in linguistic terms, they have construed their sense of space considerably differently than speakers of most other languages.

Firstly, in light of the findings of the experiments on the Pormpuraaw community, there is a sense in which the terms one is confined to within one's language are obligatory. A person could navigate either by the cardinal directions or a distinction of left and right. While the Pormpuuraw people have an extraordinary skill in operating with the former, since their language does not have the concepts of "left" and "right", they lack the ability to operate with that distinction within the constraints of their own language. They would have to resort to using another language that has those concepts. Therefore, there is a sense in which their language requires them to use cardinal directions to describe spatial orientation. Take, for example, a person asking for directions in some area a few blocks away from where he wants to reach. In a number of languages, in the normal case, the person guiding would employ the distinction of left and right and guide the other person in the following manner by pointing at the direction that the latter should follow to arrive at the desired destination: "Go along this street. Take two lefts and a right. Can't miss it." Alternatively, in the case of communicating through a language that lacks the left-right distinction, but in which the cardinal directions are utilized, the guide would give directions along the lines of the following: "Go down the street that leads northeast. Then, at the first junction, turn to the street that leads northwest. Then turn to the street that leads southwest. Can't miss it." While a speaker of English could explain

the directions in a manner analogous to the latter case, the former method would normally be used. A speaker of one of the Pormpuraaw languages, on the other hand, would have to use an explanation analogous to the latter, hence being confined to an obligatory way of expressing himself.

Secondly, there is the issue of the difference in cognitive abilities that the linguistic difference has created in the speakers of the said indigenous languages when compared to speakers of, say, English. In order to answer that, I will first define what kind of requirement must a difference in cognition fulfill in order to count as a substantial, non-trivial difference: It must have an effect that would be able to change the outcome of some situation that, in turn, has substantial consequences to its participant(s). Next I will give a description of the potentially substantial feature that the indigenous languages have and show how it fits the description of a non-trivial difference in cognitive ability as per linguistic relativity$_1$.

To illustrate the contrast, imagine a tourist being in the vicinity of a city in the middle of the desert. This tourist is approximately half a kilometre south of the city, within visual range of it. A car approaches from afar, and as a precautionary measure, the person hides his valuables under a nearby rock. When the car arrives near the tourist, the people from the car, sure enough, come out and forcibly take the tourist into it and drive off, unaware of the location of the valuables. The kidnappers blindfold the tourist and drive into the city. They strip him of any valuable items he possesses, which is, by now, not much, and after driving off into the desert again, let him go in some area in the outskirts of the city. In such a case, the skill to be able to orientate is crucial in the issue of whether or not he can find the valuables that he hid. If he has the orientation skills of an average speaker of a Pormpuuraw language and hence be able to instantaneously orientate by the cardinal directions, he would be able to discern before the kidnapping that he is in the south of the city, which is where the valuables will presumably still be when he goes back there. If he has the orientation skills of an average English speaker, then provided that he does not have a compass which he can quickly refer to, he could not quickly obtain information about his whereabouts relative to the cardinal directions. Since the average difference in competence in operating with cardinal directions correlates with difference in what kind of features the language has, it can be assumed that language has had a substantive facilitating role in the development of the related cognitive mechanisms.

Considering the habitual use of cardinal directions in the everyday speech of the speakers of the Pormpuuraw languages, being able to discern the location of the cardinal directions is a necessary skill that one needs to learn in order to become a normal speaker of the language. Hence, obtaining proficiency in the Pormpuuraw languages would necessarily have to entail the ability to proficiently orientate by the cardinal directions. Although Pinker is right that in many circumstances, such a linguistically caused difference in cognition does not amount to much, in certain extreme cases it could nevertheless cause a substantial change in whether a person can fulfil a cognitive task; that is, a substantial consequence of a linguistic difference.

Conclusion

Pinker's account of how the mind works undermines the notion that language can have any effect on language in one of two ways. Firstly, according to Pinker's account, the mind thinks through a LOT that all who have the ability to learn a language, as a rule, possess. This LOT determines the range of thoughts one can think. Secondly, the LOT in turn works through a series of information processors within the mind that each have a specific function in complementing reasoning. Hence, in the account he gives in The Language Instinct (1994), reasoning is, in essence, constitutive of the computations of these information processors. He uses the analogy of a Turing machine whose computing function remains the same regardless of the input. Similarly, humans supposedly use a series of Turing machine-like processors that handle input such as language. As such, he appeals to a strong version of CTM when arguing against linguistic relativity$_2$.

The mind would have to work in the manner of one of two alternatives, both of which are problematic. Firstly, there is the explanation that the mental representations - that is, the tokenings of thoughts – that the information processors handle do not reflect context-dependent features of thinking, in which case their content varies even though their syntax should remain fixed. Secondly, there is the explanation that the mental representations do reflect context-dependent features of thinking, but that case could not provide a proper account about why the mind can have variation in how it fits beliefs into a theory. That undermines Pinker's theory that the mind consists of Turing machine-like functionally determined information processors whose way of handling input categorically invalidates linguistic relativity. Therefore, even given that a human mind works through a LOT, there is no substantial reason to give up on linguistic relativity, since his account leaves room for variation regarding what kinds of thoughts get employed based on what natural language(s) one can utilize, as stated by Fodor in The Language of Thought (1975).

Conversely, when arguing against Fodor, Pinker relaxes his version of CTM, allowing for non-computational variations in thinking. Whereas in his theoretical argument against Whorf, he strengthens it. Allowing for non-computational, not innately specified ways of handling information, he also allows for variations in what kinds of thought can be employed. One such

example in which thinking patterns have developed differently and are employed in different ways according to variations in how possible distinctions are used is the example of how speakers of Pormpuuraw languages navigate in a different manner than do speakers of other languages. They use the distinction of cardinal directions rather than the concepts of left and right, and consequently measure time and allocate objects according to the former rather than the latter.

There is a nuanced way in which Whorf was getting to the truth, which Pinker misses. Pinker attributes to Whorf an extreme, implausible, notion of linguistic relativity (*i.e.*, linguistic relativity$_2$ or linguistic determinism) and dismisses it as nonsense. He concedes that post-Whorfian experiments on linguistic relativity do suggest that language can affect one's ability to carry out some cognitive task (*i.e.*, linguistic relativity$_1$), but he disregards them as trivial. Disregarding the latter type of linguistic relativity, he overlooks the possibility that linguistic differences can, in certain circumstances, amount to substantial differences in a person's cognitive capabilities.

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Resümee

Pinkeri dilemma: miks lingvistiline relativism ei ole ei põhimõtteliselt vale ega triviaalne

Selle töö eesmärk on vaidlustada Steven Pinker’i lingvistilise relativismi vastased argumendid ning tema tõlgenduse Benjamin Lee Whorfi lingvistilise relativismi käsitlusest. Pinkeril on kaks põhiargumenti. Esiteks on tal teoreetiline argument, mis lähtub sellest, et arvestades, kuidas mõistus töötab, on põhimõtteliselt võimatu, et keel saaks substantiivsel määral mõjutada mõtlemisprotsesse. Teiseks on tal empiiriline argument, millekohaselt lingvistilise relativismi kohta käivad eksperimendid tõestavad vaid triviaalsel määral mõtlemist mõjutavat lingvistilist relativismi. Selleks, et vaidlustada lingvistilise relativismi pädevust, kasutab Pinker Whorfi vastu vaieldes arvutusliku vaimuteooria (Computational Theory of Mind) tugevat versiooni. See-eest, kui Jerry Fodor (2001) vaidlustas arvutusliku vaimuteooria tugeva versiooni paikapidavust, vastas Pinker, et ta ei toeta arvutusliku vaimuteooria tugevat versiooni. Arvutusliku vaimuteooria nõrga versiooni ja lingvistilise relativismi vahel aga vastuolusid ei ole.

Abstract

Pinker's Dilemma: Why linguistic relativity is neither false in principle nor trivial

The purpose of this paper is to dispute Steven Pinker's arguments against liguistic relativism and his exegesis of Benjamin Lee Whorf's writings on linguistic relativity. Pinker has two main arguments against linguistic relativity. Firstly, he has a theoretical argument, which is that given the account of the mind that he subscribes to, it is in principle impossible for language to be able to influence thought processes to a substantial extent. Secondly, he has an empirical argument, according to which experiments about linguistic relativism prove only a weak form of linguistic relativity that affects thinking to a trivial extent. In order to argue against linguistic relativity, Pinker uses the strong version of the Computational Theory of Mind. However, when Jerry Fodor (2001) disputed the plausibility of the Computational Theory of Mind, Pinker answered that he does not support the strong version of the Computational Theory of Mind. The weak version of the Computational Theory of Mind and linguistic relativity are compatible with each other.

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