IB Internal Assessment

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Title:

To what extent does the structure of a language affect its speakers' world view or cognition?

Part of the syllabus to which the exercise relates:

Core Theme

Number of words:

1837

Stimulus:

My stimulus is an extract from "Story of Your Life" by Ted Chiang, which describes how the main character, Dr. Louise Banks, has encountered a queer semasiographic (signs and icons instead of words and sounds) language from aliens called *heptapods*. Its language has free word order and the entire sentence is drawn simultaneously instead of written in sequence as in human languages, suggesting that the *heptapods* knew the whole sentence beforehand. This language structure implies that instead of experiencing events sequentially, they experience all events at once, including those happening in the future. The reason, as explained in the extract, is that when ancestors of human and *heptapod* experienced the same physical world, their ancestors favored teleology over causality for explanations of physical phenomena, thus developing an entirely different language system. Once she became proficient at *heptapod*'s language, Dr. Louise gradually acquired the ability of remembering the future. She even foresaw the death of her unborn daughter. Moreover, she found herself beginning to perceive the concept of time as *heptapods* do when using their language: following the designated future from a teleological perspective. In other words, her world view and cognition system has been significantly altered by learning *heptapod's* language.

Word Count: 200

Essay:

The stimulus essentially describes the great effect of *heptapod*'s language upon a human being - Dr. Louise Banks. Her world view, especially those upon concept of time and explanation for physical phenomena as well as human actions, once chronological and causal, becomes simultaneous and teleological. Thus arrived a deeper philosophical issue: to what extent does the structure of a language affect its speakers' world view? If it can profoundly affect the speaker's cognition, it follows that learning a foreign language with totally different underlying cognition system could change a person's world view entirely, as suggested by the stimulus. I would argue that language exerts little influence upon concepts acquired by sensory organs without much thinking process involved, but could affect people's cognition on abstract concepts or theories deeply, because though language could barely alter the established physiological structure of our brains, it could affect deeper thinking processes which lacks a designated physical structure. In the first part, I will follow the argument of universalists Berlin and Kay and examine the limited extent to which color perception could be influenced; then I will examine the result of a research supporting the weak version of the Sapir–Whorf hypothesis, and discussed how conception of time and its underlying theories could be influenced considerably by the structure of a language.

For physical object that people directly perceived by senses physiologically without much thought process, the structure of language has at best limited influence upon the speaker's world view when the physical structure is still alterable. Thinking is the process of which language has its most influence on (Gleitman 634), but information already gathered by senses could hardly be manipulated by language structures. If there is, the modification should indeed be very small, unless the language is taught to the subject at very young age when one's brain's physical structure is still at forming stage. Take Berlin and Kay's theory about the color perception system as an example (Berlin et al. 104-112). From their research of twenty different languages, they have found that there is a universal restriction on the number of basic color terms that a language can possess: there is only eleven possible basic color categories. What's more, focal hues for each color category are almost identical among the researched languages. These two facts indicate that color perception has at least some universal physiological bases that all human beings across different languages possess. No matter what language this group of people use, they have the same hue chosen for red, green, blue, etc. Defining a new color term cannot be used to generate a twelfth basic color

category, because according to the structure of human eyes and the nervous system in charge of color vision, human cannot distinguish this new color category from others.

Some relativists may argue that some languages, like *Himba*, only has five basic color terms (Roberson 163), which greatly restricted the way they perceive the world, because they need more time to distinguish between two colors that fall under the same color category in their language (Regier 443). However, that is because *Himba* was introduced to them at a very young age when their brains were still developing and able to be reshaped in terms of color boundaries. In this case, *Himba* as a language indeed affects its speakers' worldview to a certain extent. However, if *Himba* was introduced to an adult speaking English, he/she will not likely be limited by its color categories, because once their brains have passed the critical childhood period of development, their physiological characteristics could hardly be reshaped, even if they have become fluent at *Himba*. Moreover, researches have also shown that *Himba* possesses universal color hues of black, white, green, red, and yellow (Regier 443). This suggest that although color boundaries might be altered by the structure of language, universal similarities still exist across languages, limiting their influence on speaker's color perception. After all, cognition system is fundamentally based on physiology. Therefore, we could reasonably conclude that for physical senses, mother tongue could have some influence upon the speaker's cognition by modifying certain physiological formation before its finalization, whereas foreign languages acquired after childhood could hardly have an impact on it.

In the stimulus, after acquiring the *heptapod*'s language as an adult, the protagonist suddenly gained the sense of the memory of future events, while lacking any necessary alteration of neural connections in her brain. This scene should be deemed as unrealistic because the system of acquiring new memories depends on the processing of external stimulus into inner electronic information by sense organs. Human beings physiologically lack the sense organ of acquiring information from future events, thus are in want of such abilities. Without dramatic alteration of physiology, Dr. Louise could hardly gain this capability of remembering the future.

Nonphysical and abstract concepts or theories are the parts language has its considerable power over. A lot of thinking processes, the physiological basis for which is easily alterable, are involved in the formation of abstract concepts. Therefore, different languages could exert

their own influence on the formation of these thoughts. It is argued that there is no special module for higher mental processes (Fodor and Jerry), i.e., the other parts of the mind can influence their inner workings, and that we are a long way from having any account of how thinking and reasoning work. I would agree that there is no definite module controlling the higher mental processes; however, contrast to the view of people's ignorance of the mechanisms behind thinking, with recent advanced in neuroscience studies (Vuilleumier 837-855), we have found that the reason why these processes aren't sealed to exclude changes is that they generally involved interaction among various brain regions, so that no single brain region could solely dominate these processes. Given this great plasticity of higher order mental processes, language could probably play a critical role in it.

In the perception of time, a recent research (Chen 690-731) has shown that languages that grammatically associate the future and the present foster future-oriented behavior: save more, retire with more wealth, smoke less, practice safer sex, and are less obese. Adding to the evidence is the result that the frequency of referring to future tense from babies using weak future time reference (FTR) languages is basically the same for babies using strong-FTR languages; however, adults using strong-FTR languages use future tense more frequently than those using weak-FTR languages. This result suggests that learning strong-FTR languages indeed render people more likely to distinguish future from present. That people using weak-FTR languages tend to save for the future is indeed a solid evidence for how the grammatical structure of a language could influence the speakers' perception of time, thus further affecting the decision-making process, one of the higher order mental processes.

Another example lies in novelist and philosopher George Orwell's novel 1984, about how vocabulary of language could affect people's political conception. In 1984, the country of omnipresent government surveillance developed a new language called "Newspeak", in which any word contradictory to the ideology of the government is removed from the vocabulary list, including "freedom", "honor", "justice", "morality", "science", and "religion", while all attempts to think that way is called "crimethink", deemed by the government as a serious criminal conduct. Once Newspeak has entirely replaced English in day to day communication, people will not find the appropriate word to express their objection to the existing government's ideology. Moreover, as time goes by, they will not only become unable to talk about these concepts, but also become unable to think about them. Contradict to universalists' opinion, I agreed that conceptualization is not a process

independent of the influence of language. We always said, “writing is the process of thinking itself.” A vague, obscure idea collapsed into a clear, distinct meaning through the channel of language. Therefore, language clearly facilitates certain thinking process, creating a shortcut to certain concepts. The absence of these shortcuts will indeed significantly increase the difficulty of thinking in those certain ways. Thus, Newspeak could indeed influence people’s thinking process, reducing the possibility of formalizing a different political ideology. However, I do not hold the opinion that this practice can terminate the whole concept of this different ideology from the speaker’s mind. George Orwell’s assumption is that language *enables*, not *facilitates*, the formation of the concept. However, if we dig into this argument we could find it unreliable. If language enables concepts, them how could the concept, first of all, appeared in people’s mind and be used by people to construe a corresponding word? The words related to “science” isn’t given by the god to describe the action of questioning and experimentation; it is those human pioneers who questioned dogmas and conducted experiment that later people deemed as scientists. It is the fields they devoted themselves to that people rendered as science. Therefore, we could clearly see that concept is formed prior to the emergence of corresponding word. Word will automatically come out when people want to express a concept. That is the reason for the continuously expanding English dictionary. So, in conclusion, with nonphysical identities and concepts, the structure of language can facilitate the thinking process of certain theories, but cannot eradicate the existence of others.

In the stimulus, heptapod’s language facilitates a simultaneous view upon perception of time. That is, we hold on to the purpose and act accordingly, instead of following chronology entirely. As we can see from the example of weak- and strong-FTR languages, people using weak-FTR language associate present with future more frequently, follow the purpose of the self-constructed future and conduct many future related actions. We could consider heptapod’s language as an extreme example of non-FTR language, linking every present and future event. Therefore, although human beings lack the physiology to directly perceive the designated future, it is possible that they utilize their own abilities of future prediction and follow that self-assigned purpose teleologically once they have become proficient at heptapod’s language. So, although Dr. Louise might not be able to foresee the definite future as *heptapods* do, she will be able to think and act teleologically upon her own simulation of the future. Also, acquiring heptapod’s language shouldn’t bring so enormous a change to Louise, because she should have had this ability of performing teleology of her own predicted

future already: *heptapod*'s language only creates a shortcut and makes this process easier to perform.

From the aforementioned discussions, we can hereby arrive at the conclusion that for perception of physical object that depends on the presence of certain sensory organs, language could only have very limited effect at early ages, and almost no effect at all after the childhood brain development period; for nonphysical concept and theory of the world, language could facilitate certain way of thinking over others, but cannot prevent people from thinking in different ways, i.e., eradicate the existence of other ways of thinking. In the case of the stimulus, Dr. Louise cannot acquire the ability to foresee future merely by becoming proficient at *heptapod*'s language, but can indeed think and act teleologically more frequently under the influence of *heptapod*'s language as a shortcut for such practice.

Word Count: 1857

The full stimulus:

pp 128-129 of Ted Chiang's "Story of Your Life"

"Consider the sentence 'The rabbit is ready to eat.' Interpret 'rabbit' to be the object of 'eat,' and the sentence was an announcement that dinner would be served shortly. Interpret 'rabbit' to be the subject of 'eat,' and it was a hint, such as a young girl might give her mother so she'll open a bag of Purina Bunny Chow. Two very different utterances; in fact, they were probably mutually exclusive within a single household. Yet either was a valid interpretation; only context could determine what the sentence meant.

Consider the phenomenon of light hitting water at one angle, and traveling through it at a different angle. Explain it by saying that a difference in the index of refraction caused the light to change direction, and one saw the world as humans was it. Explain it by saying that light minimized the time needed to travel to its destination, and one saw the world as the *heptapods* saw it. Two very different interpretations.

The physical universe was a language with a perfectly ambiguous grammar. Every physical event was an utterance that could be parsed in two entirely different ways, one causal and the other teleological, both valid, neither one disqualifiable no matter how much context was available.

When the ancestors of humans and *heptapods* first acquired the spark of consciousness, they both perceived the same physical world, but they parsed their perceptions differently; the worldviews that ultimately arose were the end result of that divergence. Humans had developed a sequential mode of awareness, while *heptapods* had developed a simultaneous mode of awareness. We experienced events in an order, and perceived their relationship as cause and effect. They experienced all events at once, and perceived a purpose underlying them all. A minimizing, maximizing purpose."

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