

Vietnamese English Speakers' Conception of Time Through Spatial Metaphors and Its Implications on Cross-Cultural Communication

Tran Thanh Du*, Au Minh Triet, Nguyen Tran Uy Vu

Faculty of Foreign Languages, Thu Dau Mot University, Thu Dau Mot City, Vietnam

Email address:

dutt@tdmu.edu.vn (Tran Thanh Du)

*Corresponding author

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Abstract: This study briefly reviews the empirical history of the aforementioned questions and describes the process of designing and conducting two experiments that demonstrate the role of language in shaping habitual thought, with the subjects being Vietnamese English speakers (2nd and 3rd year English majors from Thu Dau Mot University - TDMU). The results are placed and analyzed in contrast with a similar study done on Chinese English speakers to determine whether Vietnamese English speakers utilize similar spatiotemporal metaphors of their first language when thinking about time in English and whether their patterns differ from that of Mandarin and native English speakers. It is concluded that (1) conception of abstract domains such as time can be shaped in a speaker's thought by the language (s) they speak and (2) one's native tongue has a significant influence in shaping habitual thought but does not wholly regulate one's cognitive power as espoused by the Whorfian view of linguistics. From the research results, this research help to call to attention the fascinating intersectionality of language, culture, and history within a language of a non-dominant culture and former colony, as expressed through its speakers' way of thinking about time. In language education at large, these experiment's results should provide understandings regarding the changing nature of student's cognitive habits in relation to their foreign language proficiency. Since TDMU English majors could possibly possess both English and Mandarin's perception of time, it would be interesting if their results from these experiments are put into comparison with students from non-linguistic majors but attending one of the aforementioned secondary language class provided by TDMU's Foreign Language Center in order to paint a clear picture regarding the thought-shaping properties of potentially all three subject languages (Vietnamese, English, and Mandarin).

Keywords: Conception, Cross-Cultural Communication, Metaphor, Spatial Metaphor, Time

1. Introduction

1.1. Reasons for Choosing the Topic

The works done by Benjamin Lee Whorf are primarily attributed to the birth of a philosophy called Linguistic Determinism, which predicates on the notion that thought is determined by language. Impressed by the sheer number of human languages spoken throughout history, Whorf [5] proposed that the types and distinctions of each human language facilitate a distinct way for a human being who speaks that language to perceive, evaluate, and react to the world around

them. As languages vary, perception and actions of their speakers must vary as well. The field of linguistic has long rejected this rigid Whorfian view - the idea that thought is entirely determined by language, mainly since it has been known to lead to discriminative presumptions and ethnocentric assessments. In a research into the Hopi language, Whorf had concluded that the reason why the Hopi people (a native American tribe) is less concerned with productivity was that they lacked the words to express time properly [2, 3].

Many pieces of research thereafter had produced counter-studies to undermine Whorf's doctrine, in particular Rosch's [18] study on color perception of the Dani people (a tribe in

New Guinea), proving that these people still had little trouble learning color identification in English even though they have only two words to describe colors in their native tongue [4, 18]. Linguistic determinism nowadays might seem indefensible, but it still leaves a few intriguing permutations to be explored. Slobin [20] suggested that language could affect thought during the process called "thinking for speaking." By enforcing grammar and collocative rules, the language we speak can influence us to have bias over certain aspects of our experience [20]. Hence, people speaking different languages might be partial to encode different aspects of their experience into the way they speak. This was supported by Hunt and Agnoli [11] when they reviewed some evidence suggesting that language may influence thought by making habitual discrepancies between cultures more fluent [11].

Inspired by Rosch's study on color, several lines of research have since developed on domains that appear more likely to reveal linguistic influences. On time conception, in particular, there was [3] who showed that Mandarin speakers would find it more natural to construct a vertical timeline when thinking about purely temporal relation while English speakers were more predisposed to think about time horizontally because horizontal spatial terms predominate in English temporal descriptions [3]. As time - a vast domain of existence and language - a considerably narrower field collide, there were many researchers from different disciplines who have come up with various models and categories of how we perceive time through our language. Moreover, since time is not tangible - i.e., it cannot be touched, seen, or experienced by our earthly senses - we have to indirectly perceive it by the forms of the objects around us and record this perception through the explanatory power of our language. Moore [14] and subsequently Radden [17] described many models of such, including vertical time, horizontal time, Time-moving, and Ego-moving. This prompted the study on Vietnamese's time perception in hand gestures from Sullivan and Linh Thuy Bui [21] modeled after a similar study done on the Aymara tribe and came up with evidence showing Vietnamese tend to think of time as a linear line with the future behind and past in front of them [21].

All throughout these ventures into the inner workings of languages and their conceptions of fundamental ideas such as time, a disparaging denominator appeared: the subjects of these researches are either language of a dominant culture (for example, English and Mandarin) or the language of an "untouched" tribe (Dani, Hopi, and Aymara), the latter possess little to no influence from the former, yet oftentimes being placed next to the former for comparison and scrutiny. This practice carries within itself a bias from the researchers, who were mainly white scholars conceptualizing indigenous people and their language as an ideal while being hostile towards those natives who fall short of that construct. Even with the aforementioned study from [21], the deep cultural and historical context behind the Vietnamese language's amalgamation of time conception was barely touched on and treated as a given. This research, therefore, was written in order to call to attention the fascinating intersectionality of

language, culture, and history within a language of a non-dominant culture and former colony, as expressed through its speakers' way of thinking about time.

1.2. Research Questions

The experiments devised and conducted below are to answer two questions: (1) Does the English language affect TDMU English majors' thought about fundamental concepts such as time? (2) If there is such an ability, how does it compare to that of their native language?

1.3. Research Sample

The first experiment conducted within this study employed chiefly 2nd and 3rd year English majors from Thu Dau Mot University. A second experiment was participated by a control group primarily made up of English major alumni from various universities in the region. Combined data was cross-analyzed with a preexisting experiment done upon native English speakers and Mandarin speakers (whom were undergraduate students of Stanford University) to ascertain the similarities in linguistic trends between the four groups.

2. Literature Review

2.1. Time as Domain of Existence

In the physical viewpoint subscribed by Isaac Newton, time is a dimension in which events occur in an irreversible sequence and can be measured [19]. Time, alongside 3-dimensional space, forms the spacetime model that is the fabric of modern physics. This implies that time is a natural construct independent of human experience, that it belongs to the outer environment and will continue to exist long after our perception ceases to do so. In the field of metaphysics, of which Immanuel Kant was one of the forefathers, time is instead viewed as a condition for our perception of objects [13]. He argues that any object that exists outside of time and space is also outside of our experience. In other words, there is existence because there is our consciousness to perceive it, and time is part of our consciousness's experience. At first glance, these articulations seem wholly contradictory to each other, but in actuality, they complement the other in many fields of study, most of which will not be focused on in this paper.

Having said that, these philosophical and rather complex definitions of time are just a paradigm of the human intellect, an example of how we actually advance through constantly questioning and conceptualizing the status quo. In the aforementioned process, language plays a key role. Ever since the invention of spoken language by prehistoric humans and later written language during the third millennium B. C. [8], the development of civilization also went side by side with the evolution of our language-of which the effort spent in conceptualizing the world around us was always visible. Language, after all, is our thought expressed and articulated into orthographic words/verbal signals. Thanks to this advanced process, we are able to

navigate reality while simultaneously being anchored into it. Psychopathy—a break from reality—happens when one's logic of navigation erodes and fades away, resulting in failure to convey proper thoughts. This is not to say that each and every human language is mere nomenclature or a set of universal concepts. Had this been true, cross-language translation and language learning would have been faster and easier than they really are, for we could have simply replaced a name in one language for a particular concept with its name in another language. In reality, this is purely inaccurate due to the way a large number of concepts in one language might be radically different from those of another. The act of articulating and organizing the world of each language hence are different depending on each language's underlying conceptions of ideas such as time. In the words of [7], languages do not name already existing categories; they articulate their own.

When it comes to conceptualizing time, the rule of thumb is that we tend to describe time in terms of space and not the other way around. This is because the abstract domain of time lacks any expressions that describe observable structures. As a result, relational descriptions are borrowed directly from the domain of space—which develops from human's physical experience of the environment—to fill this need of navigating time. A sole exception of this generalization is the preposition "*depuis*" (since) in French [9], which is a purely temporal expression now used to map spatial relations, as in [*Rapatriment*] *depuis la Syrie*" ([repatriation] from Syria) [10].

As dissected from the heavily biased works of Whorf and other Western linguists of the time, not having an expression to describe time does not mean not having the corresponding notion of time. It is better to accept the assumption that as a collective of different cultures and peoples, we all have our distinct conceptions of time, and we choose to chart at least a few of them on a spatial map that is available in our own language. Radden [17] advocated for this line of progressive reasoning by saying that the way we think about time can, in turn, prompt our choice to use spatial relations and their linguistic expressions. That is to say, no lines of thinking about a concept as abstract as the domain of time are definitively more accurate than others, as it all depends on the geographical and cultural elements of each language. Below is a concise summary of various models of time in linguistic expressions.

2.2. Time in English, Vietnamese and Mandarin Chinese

2.2.1. Time in English

In the English language, the horizontal line is predominantly adapted to represent time. Many scholars have patternized that in English, time is understood as going left to right or right to left, depending on the perspective [16]. This corresponds with the way the language - with its root from Latin - has always been written in lines that flow

systematically from left to right. Furthermore, a person can say they push a meeting *back* or move an appointment *forward*. As antecedently mentioned, people can also have lunch *before* going to the theater.

There are, in fact, vertical metaphors used in English to describe time, such as *handing down* a family heirloom, or a skill that is *passed down* from generation to generation, or buying presents because Christmas is *coming up*. Nevertheless, the use of vertical spatiotemporal metaphors is not as systematic as in Mandarin.

2.2.2. Time in Vietnamese

While listing the linguistic evidence of vertical time in "the East," Radden [17] remarked that the past-up future-down axis of time is extant amongst 4 out of 5 subject languages, namely Mandarin Chinese, Southern Min, Korean, and Japanese, but not Vietnamese [17]. In fact, little evidence of a spatiotemporal metaphor explicitly uses vertical relation can be accounted for in the official Vietnamese language, with perhaps the exception of an old expression: "*gần đất xa trời*" (closer to Earth, further from the sky), used to describe the state of nearing one's end of life. This example correlates with the past-up (sky-younger age) future-down (earth-death) model of vertical timeline perfectly, possibly for its link to Mandarin Chinese. Given Vietnam's history of cultural and geographical closeness to China, one would expect the Vietnamese language to possess more vertical relations in its spatiotemporal metaphors. Still, Linh Thuy [12] stated that Vietnamese positions events on a horizontal timeline similar to many horizontal-minded languages and went on to give evidence on how Vietnamese speakers perceive the time-line as future-back and past-front [21].

2.2.3. Time in Mandarin Chinese

To denote time, speakers of the Mandarin language have both horizontal and vertical spatiotemporal metaphors. Words like *qián* |前| (front) and *hòu* |后| (back) are characterized as horizontal metaphors. Vertical metaphors—which are more widely used—are *shàng* |上| (up) and *xià* |下| (down). Nunez and Sweetser [15] also noticed this phenomenon of using vertical axis to frame time appeared in many old, obsolete Romance languages such as High Middle English or Low Middle Age French, in which *low* refers to a later time. In Mandarin, however, the use of vertical metaphors is more systematic and with a higher frequency rate. It is theorized that the aforementioned proclivity was born from the observation of the sun's movement. The sun plays an integral part in leading to ancient China's advancements in astronomy thanks to its perceived ecliptic orbit and rise-set cycle [6]. When the sun rises, it is on a trajectory towards the highest and furthest point from the horizon (noon) before plummeting down into the horizon again, ending a cycle. Because sun-down is an eventual fate of every cycle, "down" (*xià*) is conceptualized as the future, and "up" (*shàng*) is "past" in Mandarin Chinese. Furthermore, the writing system of traditional Chinese was in columns from top to bottom.

¹ In the same article, "*depuis*" was also used simultaneously as a temporal expression: "*Depuis 2019*," (Since 2019,) (Hivert, 2021)

3. Research Results

3.1. Results from Experiment 1

3.1.1. Participants

Thirty participants who were 3rd and 2nd-year English majors at TDMU took part in this experiment. No participant received any kind of payment or incentives for their participation. All thirty had Vietnamese as their first language, and itself was their only language until at least the age of 8. The mean age of their onset of English acquisition was calculated at 9.5. Twenty responses were later randomly selected to put into analyses after incomplete responses had been omitted.

3.1.2. Design

Participants answered questions about time that had been preceded by priming questions (primes) using spatial relations under a survey format. Primes were a written description under visualization of either a horizontal or vertical scenario. Targets were temporal statements, either with spatial metaphor pair of before/after or the purely temporal pair earlier/later. Participants were not made aware of the nature or objective of the experiment beforehand and were asked to complete a survey consisting of 6 practice questions and 16 experimental trials. Each experimental trial

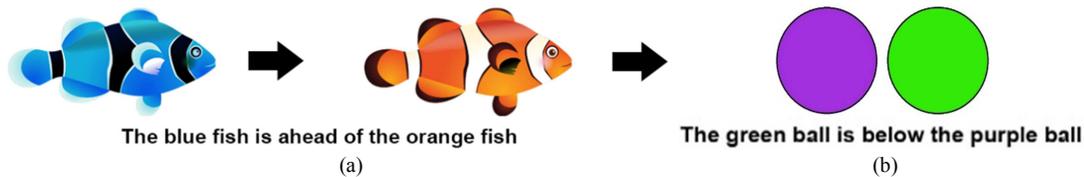


Figure 1. (a). Example of a horizontal prime; (b). Example of a vertical prime.

Targets: 8 sentences about months of a year were chosen as targets. Half (4) used spatiotemporal terms before/after (for instance, "July comes before June"), and the other half used purely temporal terms earlier/later (for instance, "July comes earlier than June"). All four terms were counterbalanced in use. All targets were TRUE.

Fillers: 10 additional primes and 5 targets were used as filler trials. These filler trials and their set of questions were similar to experimental trials, except that all their targets were FALSE (for instance, "October comes earlier than August"). The fillers' primes were constructed by reversing the spatial relation of each question randomly. Responses to filler trials were not taken into analysis.

3.1.4. Procedure

Participants each took the survey individually and separately from each other. All participants were tested in English with primarily English instructions. The questions were designed to appear on the screen one at a time. For each question, participants were made to respond with TRUE or FALSE as quickly as possible within a 7-second deadline by clicking on one of two options on the screen. Response time (RT) of each question afterward was recorded by the survey program. Participants were later asked to rate the difficulty

contained two primes (either both horizontal or both vertical) followed by one target. The order of questions inside an experimental trial was arranged so that the first prime was FALSE, the second prime was TRUE, and the target was TRUE. To prevent participants from figuring out the inner order of the experimental trials, filler trials were inserted randomly between experimental trials. One target was answered twice, once after each type of prime.

3.1.3. Materials

A collection of 8 targets and 32 primes, all TRUE/FALSE, was constructed.

Primes: 32 spatial scenarios were designated as primes under image format. Each image contained a picture depicting two separate objects and a sentence description below describing their spatial relation. Half (16) of these were horizontal relations, and vertical relations made up the other half (see Figure 1a and 1b). Half (8) of horizontal primes used "X is ahead of Y" phrasing, and the other half used "X is behind Y." In the same vein, half vertical primes used the "X is above Y" phrasing, and the other half said, "X is below X." All primes were equally often TRUE and FALSE. Additionally, the left-right orientation of horizontal primes was counterbalanced across all variations.

level of the test from 1-5, 1 being extremely easy and 5 extremely hard. There was no direct feedback given to the participants.

3.1.5. Results

Compared with the results from the Boroditsky's experiment, native Vietnamese in this first experiment showed a linguistic bias to a vertical mode of thinking about time. With regards to both types of targets, the time it took for this group of participants to respond to target questions was shorter when they were primed with vertical scenarios. However, faster RT to spatiotemporal before/after questions after vertical primes and not horizontal primes meant that Vietnamese's pattern of temporal thinking also differs in some aspects from Mandarin speakers, despite seemingly possessing the same spatial bias.

Only responses to target questions were analyzed. Responses surpassed the deadline and incorrect responses (FALSE) were not put into analysis. A percentage of 4.06% of all recorded responses were discarded. Participants appeared to make slightly more errors when given before/after targets (3.75%) than earlier/later targets (2.81%); error rates between prime types were 4.69% for horizontal primes and 3.44% for vertical primes (see Figure 2).

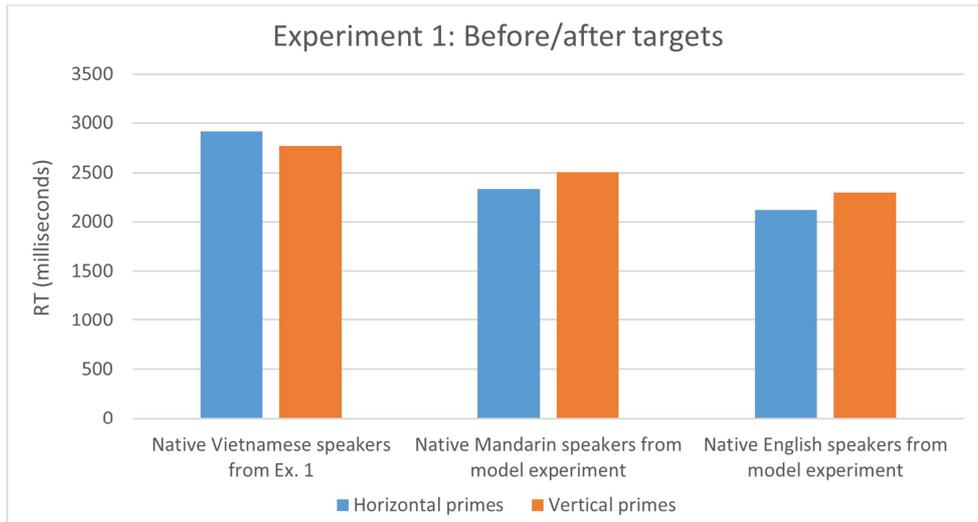


Figure 2. Before/After targets RT of Experiment 1.

Contrary to native Mandarin and English speakers from the model experiment, native Vietnamese speakers from TDMU answered targets with the spatial terms before/after faster with vertical primes (2768ms) than horizontal primes (2912ms). In the model experiment from Boroditsky, the trend was that both Mandarin and English speakers answered before/after questions faster after they had been conditioned by a set of horizontal primes, itself correlated with the spatial nature of the target type. Instead of assuming the spatial terms before/after as spatial relation on a horizontal axis, participants in this experiment had seemed always to apply a way of thinking vertically onto the target question they were

presented, regardless of the conditioning agents which had been introduced before the target questions to influence their thought. This could be possibly viewed as a unique example of earlier findings that spatial knowledge can be used in the online processing of spatiotemporal metaphors.

It should be noted that RT of Vietnamese speakers ranged the slowest (avg: 3501ms) behind Mandarin and English speakers (2425ms and 2214ms respectively) (see Figure 3). This could have been resulted from the comprehension rate of the test language from each group, with native English speakers having an advantage of English being their first language over Mandarin and Vietnamese speakers.

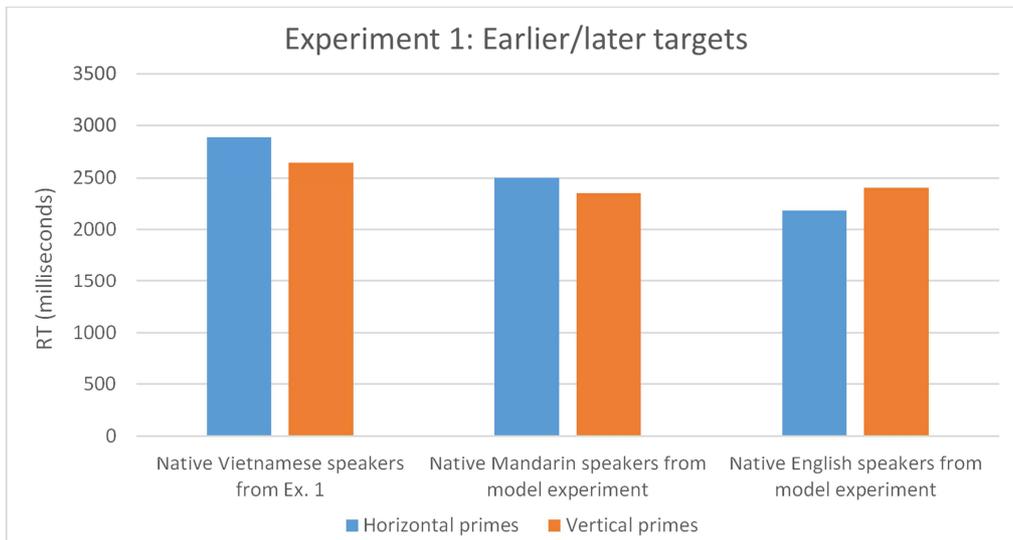


Figure 3. Earlier/Later targets RT of Experiment 1.

As predicted, when it came to the purely temporal terms earlier/later, the pattern from native Vietnamese speakers stayed the same as before and correlated with that of native Mandarin speakers. The average RT for targets after horizontal primes was 2889ms and 2645ms for targets after vertical primes. In the model experiment, the

average RTs of native Mandarin speakers were 2503ms and 2347ms for targets given after horizontal and vertical primes, in that order. This meant that when the situation put this experiment's participants into examining time as an abstract construct without a preexisting "frame of reference" —i.e., a literary metaphor to anchor their

thought—they tended to process time as a vertical line, much similar to Mandarin Chinese. On the other side of the spectrum were the native English speakers from the model experiment, scoring an average of 2180ms per target after horizontal primes and 2400ms after vertical primes. This bias towards horizontal spatial relations was predicted by the proliferate use of horizontal spatial metaphors in the English language [4].

It was also worth noticing that in this experiment, the participants' RT time was significantly higher than that of Mandarin speakers of the model experiment. This could be due to either technological discrepancies in the mechanism of the program used to conduct the experiment, thus slowing the total time for participants to complete a question, the students' inherent English comprehension rate, or both. Having said that, this deviation in numerical values of RT was not significant in the regard that there were still patterns and trends from the participants to be extracted.

3.1.6. Discussion

In the model experiment from which data was compared to Experiment 1's, native Chinese speakers and native English speakers were found to think differently about time [4]. English speakers were quicker to validate that "October comes earlier than December" was "true" once conditioned with horizontal primes than vertical ones. This horizontal predilection of thinking about time was expected by the wide range of horizontal spatial metaphors people were accustomed to as they refer to time in English. The reverse was true for Mandarin speakers since they were faster to verify "October comes earlier than December" when met with vertical primes beforehand. This convention of thinking about time vertically was expected by the widespread use of vertical time metaphors within the Mandarin language. Between these two instances, native Vietnamese speakers—at least the participant demographic of this experiment (college-age students)—preserved a habit of thinking about time vertically even when presented with a set of horizontal primes. Participants of this experiment, similar to Mandarin Chinese speakers, were faster to confirm time questions when they were trained with vertical primes and even showed possible resistance to horizontal conditioning. Since the exact amount and deviations of spatiotemporal metaphors in the Vietnamese lexicon still remained undetermined, historical, cultural, and socioeconomic influence should be taken into account more in further researches. To briefly conclude, data from this experiment interrelated with earlier findings that habits in language can encourage cognitive habits [3, 4]. Given that both Vietnamese and Mandarin speakers showed vertical bias even when thinking for English, there is the impression that language-encouraged habits in thought will operate no matter what the second language one is currently thinking for.

The second experiment would attempt to examine further some of the discrepancies left by the first experiment, namely the difference in RT margin between subjects and the nature of the Vietnamese speaker's apparent vertical bias.

3.2. Results from Experiment 2

3.2.1. Participants

Twenty participants who were English major alumni from various universities were invited to partake in this experiment as a "control group." No participant received any kind of payment or incentive for their participation. All twenty had Vietnamese as their first language, and it was their only language until at least the age of 8. The mean age of their onset of English acquisition was similar to that of the first group, with the only between-subjects factor being their year of exposure to English. Twenty complete responses were later put into analyses.

3.2.2. Design

Design-wise the second experiment had the same structure as the first one. Participants were asked to judge spatial relation scenarios followed by a statement about time under a survey format. Primes were a written description under visualization of either a horizontal or vertical spatial relation scenario between two objects. Targets were temporal statements, either phrased with spatial metaphor pair of before/after or the purely temporal pair earlier/later. Participants were not made aware of the nature or objective of the experiment beforehand and were asked to complete a set of 6 practice questions and 16 experimental trials. Each experimental trial contained two primes (either both horizontal or both vertical) followed by one target. The order of questions inside an experimental trial was arranged so that the first prime was FALSE, the second prime was TRUE, and the target was TRUE. To prevent participants from figuring out the inner order of the experimental trials, filler trials were interspersed between experimental trials. Each target was answered twice, once after each type of prime.

3.2.3. Materials

A collection of 128 primes and 32 targets, all TRUE/FALSE, was constructed.

Primes: 32 spatial scenarios were designated as primes under image format. Each image contained a picture depicting two separate objects and a sentence description below describing their spatial relation. Half (16) of these were horizontal relations, and vertical relations made up the other half (see Figure 1a and 1b). Half (8) of horizontal primes used "X is behind Y" phrasing, and the other half used "X is behind Y." In the same vein, half vertical primes used the "X is ahead of Y" phrasing, and the other half said, "X is below X." All primes were equally often TRUE and FALSE. Additionally, the left-right orientation of horizontal primes was counterbalanced across all variations.

Targets: 8 sentences about months of a year were chosen as targets. Half (4) used spatiotemporal terms before/after (for instance, "July comes before June"), and the other half used purely temporal terms earlier/later (for instance, "July comes earlier than June"). All four terms were counterbalanced in use. All targets were TRUE.

Fillers: 10 additional primes and 5 targets were used in

filler trials. These filler trials and their set of questions were similar to experimental trials, except that all their targets were FALSE (for instance, "October comes earlier than August"). Responses to filler trials were not taken into analysis.

3.2.4. Procedure

Participants each took the survey individually and separately from each other. All participants were tested in English with primarily English instructions. The questions were designed to appear on the screen one at a time. For each question, participants were made to respond with TRUE or FALSE as quickly as possible within a 7-second deadline by clicking on one of two options on the screen. Response time of each question afterward was recorded by the survey program. Participants were later asked to rate the difficulty level of the test from 1-5, 1 being extremely easy and 5 extremely hard. There was no direct feedback given to the participants.

3.2.5. Results

There were interesting patterns that emerged from the second group's test. In comparison with the results from the first group of participants, the control group showed a horizontal bias similar to native English speakers. This is connected to the fact that all participants of the control group have had extensive exposure to English, first in education and second in everyday life and the workplace. With regards to both types of targets, the time it took for the control group to respond to target questions was shorter when it was primed with horizontal scenarios. This was a complete departure from the trend of the participants from the first experiment. Not only did control group members had a generally faster RT to all questions for both ways of phrasing, but they also solved target questions quicker after presented with horizontal primes. This also fell in line with the existence of horizontal spatial metaphors in the Vietnamese language's lexical resource, alongside vertical ones (see Figure 4).

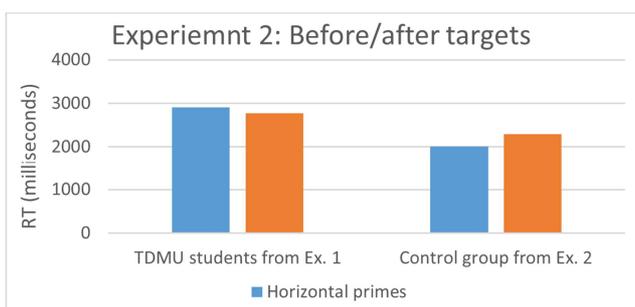


Figure 4. Before/After targets RT of Experiment 2.

By means of the spatiotemporal pair before/after, participants from Experiment 2 had an average RT of 2005ms, almost 1 second (1000ms) faster than their younger counterpart (2912ms) when it came to horizontal primes; and had a slower average RT of 2290ms when it came to vertical primes (see Figure 5).

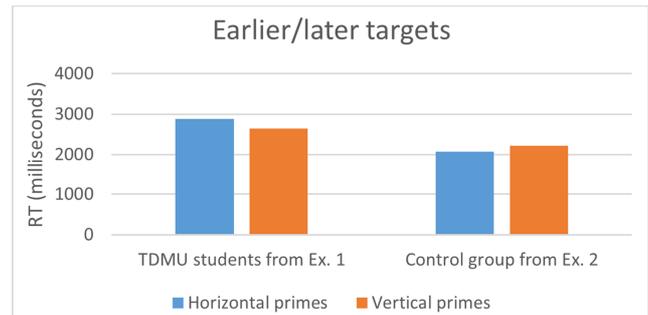


Figure 5. Earlier/Later targets RT of Experiment 2.

Furthermore, when given the purely temporal pair earlier/later, the trend continued with faster RT to targets after horizontal primes (2079ms) than vertical primes (2225ms). This further supports the notion that this group of participants from Ex. 2 had a collective cognitive habit of thinking about time as a horizontal line, as opposed to the participants from Experiment 1.

3.2.6. Discussion

In this second experiment, a different group of native Vietnamese speakers was made to perform the same test like the ones in Experiment 1 to shed light on the issue of slow RT. While this inconsistency now can be interpreted as a sign of different comprehension rates—control group members were able to respond faster thanks to their prolonged exposure to English, thus being able to interpret the sentences more effectively—there was also the phenomenon of switching spatial bias. Despite majoring in English, most participants from Experiment 1 reckoned that their test was quite tricky in terms of the time limit and task requirements (70% of participants rated 4 on a scale of 1-easiest to 5-hardest upon completion); while their older and more "English-aware" counterparts in the second experiment generally passed the test with a rating of 2 for difficulty. This is not to judge that being less proficient in a language different than one's mother tongue is inherently faulty, but to point out the effect of exposure to a foreign language on one's habitual thoughts. Since control group members seemed to adapt a horizontal mode of thinking about time that corresponds to that of native English speakers, the pattern of Experiment 1's participants can be indicative of an innate vertical approach to linguistics, regardless of historical context. Although both groups were native Vietnamese speakers who shared the first language—the language which encompasses an assortment of both vertical and horizontal spatiotemporal relations—one still held on to an innate bias towards verticality, and one had adapted to a horizontal mode of thinking about time due to exposure from a language that used predominantly horizontal spatial relations.

In general, this experiment's results have provided two lines of insights: first, Vietnamese speakers appears to be affected by spatiotemporal metaphor just as the other two groups from the model experiment; second, the more exposed and immersed in a foreign language (in this case

English), the more likely they are to adapt the linguistic habits of the foreign language in question and incorporate them into their cognitive habits.

4. Conclusion

4.1. Summary of the Main Findings

Within two groups of native Vietnamese speakers, years of English exposure appeared to have an effect on how they responded to different modes of processing time. The student group with fewer years of English acquisition answered targets preceded by vertical primes faster than horizontal primes in both types of targets, seemingly as if processed before/after spatial relation as deictically neutral. This was done with the preexisting knowledge that, conversely, Vietnamese is a language that predominantly uses horizontal spatial relations when talking about time [12]. Participants in the control group who had been more exposed to English solved target questions faster when they were preceded by horizontal primes, with a faster RT to purely temporal statements of earlier/later followed by horizontal relation primes.

These results, however, did not take into account a seemingly insignificant variable: Mandarin exposure of participants. Indeed, as English majors of TDMU are regulated to study a second foreign language of two which are Mandarin and French, the chance of participants from both the first and second group having spatial knowledge from Mandarin and thus affecting the results was an accountable element. Nevertheless, at the start of each experiment, it was stated that English was the major if not the only foreign language all participants were studying as a subject, which has the most extended year of acquisition period outside of their native tongue. As participants from Experiment 1 (Group 1) came entirely from TDMU; and participants from Experiment 2 (Group 2) came from various universities—most of which did not offer Mandarin course and their current professions also do not require the use of Mandarin—only one possible hypothesis can be made: If Group 1's Mandarin knowledge did have a measurable influence on how they utilized spatial knowledge in the test, it would only serve to strengthen the view that one's native tongue has a role in shaping habitual thought since the native Vietnamese of Group 1 did not perform the test with the same exact pattern as the Chinese participants from the model study. If anything, Mandarin's vertical bias only boosted the apparent predilection to vertical relations of Group 1 participants. Still, this could open more possibilities of cross-analysis between students from two departments of foreign language training to discover more linguistic patterns between language majors and non-language majors.

4.2. Implications on Cross-Cultural Communication and Recommendations

Within TDMU and from the limitation of the experiments discussed above, there are opportunities for departments of

Mandarin and English language training programs to collaborate and expand this research of language's cognitive habits. Since TDMU English majors could possibly possess both English and Mandarin's perception of time, it would be interesting if their results from these experiments are put into comparison with students from non-linguistic majors but attending one of the aforementioned secondary language class provided by TDMU's Foreign Language Center in order to paint a clear picture regarding the thought-shaping properties of potentially all three subject languages (Vietnamese, English, and Mandarin).

In language education at large, these experiment's results should provide understandings regarding the changing nature of student's cognitive habits in relation to their foreign language proficiency. For ELT purposes nationwide, attention should be paid to developing lessons and seminars incorporating the difference between Vietnamese and English's lexicon, in particular prepositions and adverbs that describe fundamental aspects of our experience (in essence, time and other fundamental domains of existence). Translation and interpreting training also warrant these considerations. If a translator/ interpreter is acutely aware of these differences in thought-shaping patterns between languages, the product of their service would be more critical and accurate—especially if the service in question is in a diplomatic and educational context. Likewise, if learners are encouraged to be objective of their own cognitive habits involving the influence of the languages they are learning to speak, they are more likely to absorb and develop proficiency faster than taught with the conventional banking model of education². Hence, effective cross-cultural communication will be facilitated thanks to the mutual understanding of each person's linguistic difference and its acute effects on one's ways of reacting to the objective world.

A connection between behavioral psychology and linguistic knowledge is also a promissory of further researches, namely into the intersectionality of culture and language. Aaron Castelan Cargile *et al.* [1] through practical experiments found out that native English speakers from the USA view accents and the ability to speak English well from non-native are variables to assume "foreignness" and attractiveness. In other words: Native Americans perceive certain foreign accents as "exotic" and thus "desirable," while others are subjectively deemed "strange." In fact, Vietnamese participants scored the highest on the accent foreignness scale and were correspondingly put in the lowest place in terms of status rating. This prompted the question: Why should one's non-native language proficiency and the intrinsic properties of their mother tongue be subjected to fetishism and discrimination? In the current state of affairs concerning international politics and the state of our natural environment, it is imperative for fields of academia—the place where intellect means changes—to break from long-held Eurocentric observations perpetuated by

² Banking model of education (Portuguese: modelo bancário de educação) is a term used by Paulo Freire to give description and critique to the traditional education system. The name refers to the metaphor of students as containers into which knowledge is put by teacher. (Freire; "Pedagogy of the Oppressed", 1968).

imperialism and embrace the process of decolonization. Freedom of one's expression could be achieved through the dismantling process of the regressive systems presiding over their language.

As stated above, though researches aiming to bridge the gap between psychology and linguistics has long been done in a considerable amount, subjects of lesser-known languages—particularly the ones which fall in between the 'popular language-rare language' spectrum—have been largely ignored. Whether due to a lack of empirical evidence or intentional neglect stemming from disinterest in anything that does not serve to reinforce the status quo, it falls into the hand of the people whose language has not been acknowledged to study and develop a critical understanding of it. With this in mind, there is much to expand on the topic of the Vietnamese language and its cognitive properties on the speakers. Because Vietnam contains 54 different ethnic groups with prominent geographical features that simultaneously separate and conform them under one identity, studying the differences and categorizations of their respective tongues alongside the thought-shaping power of them would contribute significantly to our national linguistic corpus.

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