LINGUISTIC INTERFERENCE IN THE BILINGUAL'S BRAIN

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ABSTRACT

Many people globally are fluent in more than one language, and this raised a question of understanding on how the brain structure works or get organized when a target language is selected at a given time. Thus, the objectives of this research paper were to elaborate on how the two languages are organized in the bilingual's brain in translation and decision - making simultaneously and which forms of language conflicts take place in his / her process of performance. The results indicate that there are different instigators of language conflicts that are being experienced by bilinguals; the conflicts were, basically, to stimulus and response - related language. These two forms of conflicts were hard for the bilingual brain to avoid since target and non-target languages are activated simultaneously; therefore, in the process of translation and decision - making, they lead bilingual to cross-language interference since the two sections of the brain were activated.

Keywords: Response conflict, language conflict, bilingual, monolingual, bilingualism, stimulus conflict, lexical decision, brain

INTRODUCTION

The research study is about bilingualism as well as expounding how the bilingual brain is prone to face language interference or conflict. Bilingualism is a phenomenon of comprehending and speaking in two or more languages (Kuhl et al., 2016). Bilingualism is good especially for the people traversing in different countries or nations. Bilinguals are prone to experience different attributes or aspects. For instance, bilingualism tends to affect the brain development of an infant. The infants' brain growth and development of the bilingual infants can develop differently compared to the monolingual ones (Blumenfeld & Marian, 2014). As a result, the bilingual infants are prone to take a bit long in understanding and distinguishing the phonetic sounds linked with language. Additionally, the bilingual people are meant to do well in cognitive functioning since they have embraced flexible and stronger cognitive abilities (Kuhl et al., 2016). The ability of mastering two languages gives them an opportunity to multitasking and solving the logic problems with a section of the brain that does an executive control function.

The potential to speak in two languages surprises monolinguals, although bilinguals emphasize no difficulties in speaking two languages (Choi, 2019). Research has shown that bilingual individuals continually defeat monolingual individuals on matters concerning executive control (Borders et al., 2018). A considerable number of people can speak fluently in at least two languages. This creates the essential interrogation of the organization in the brain of the language network to the point that the right target language is chosen at a specific occasion. This research shows that bilingual processing leads to language conflict in the bilingual brain, even when bilingual individuals' critical duty is to aim language knowledge. The research will show that it is difficult for the bilingual brain to prevent language conflict since words for non-target and target language are impulsively triggered when reading. Despite having the strengths linked with bilingualism, there has been an interest in expounding the possibility of bilingual people to face language conflict in the brain.

Research Problems and Questions

In general, bilingualism is superior to monolingualism; it is because the former is considered an advantage possessed by a bilingual as he / she uses two or more languages properly in certain situations such as translation and decision - making. However, several studies in the literature review of linguistics emphasized that there are some problems faced by bilinguals. They are manifested in the intervention of one language words or statements over the other. They affect negatively the quality of the targeted language expression in the two processes. Therefore, this study focuses on both bilingual's brain functions in relation to interference and language conflict. Based on the problem of the study, the following questions are posited

1. How does the brain structure work in bilinguals when a language is selected?
2. How are the two languages organized in the bilingual brain?
3. What are the language interference and conflicts that take place in the bilingual's brain?
4. How both stimulus-related and response-based conflict were observed?

Research Objectives

The current study aims to achieve the following objectives:

1. To find the triggers of language interference in the bilingual's brain.
2. To explain how and where the languages are kept in the bilingual's brain.
3. To find how lexicality affects language in bilinguals.

LITERATURE REVIEW

Bilinguals versus Monolinguals

During the time of acquiring knowledge, language is an essential organ that helps in controlling memory, feeling, thoughts, and movement. The brain structure or regions are critical especially in causing the language interference, and therefore, there is a contrast between imaging of the monolingual and bilinguals (Hayakawa and Marian, 2019). In understanding the brain regions, the contrast is based on the control words of the bilinguals and homographs (Weissberger et al., 2015). The assessment of different language speakers has been assessed through the use of language learning strategies (Gargalianou, Urbig, and Van Witteloostuijn, 2017). The learning strategies are thoughts and behaviors that engage learners as well as influence their encoding process (Klein et al., 2014; Sato, Casaponsa, and Athanasopoulos, 2020). The difference between monolinguals and bilinguals is assessed in their effectiveness during the time of learning a foreign language (Fayyazi et al., 2017). From the findings of several studies, there has been a positive correlation that exists between bilingualism and strategy use.

Additionally, the implication is that the bilingual shows effectiveness with the use of language learning strategies in comparison with the monolinguals ((Filippi et al., 2020). Amid a time of learning the language, the bilinguals seem to have a great favor since they are intrinsically motivated unlike the monolinguals (Deluca et al., 2020). In terms of proficiency level during the time of mastering a language, the language speakers face the differences. For instance, the best persons in mastering the language are the monolinguals unlike bilinguals since they have to speak in two languages thus making it hard to master and be proficient in both languages.

Ways in which the bilingual people keep their languages

The way the bilingual people have been keeping the more than two languages has been a question of interest for many years, and the concern has been whether each language is kept in its area in the brain section, or are they overlapped in the brain? Among the studies that were being conducted, they showed that the proficient bilinguals have been activating the same brain region they rely upon when using the two languages (Garbin et al., 2011; Pliatsikas and Luk, 2016). More so, by the study with the Magnetic Resonance Imaging (MRI) study toward the Spanish-English bilinguals, the participants aged 5 years took part in the research, and the findings showed that the two languages were being represented in overlapping areas of the brain (Calabria et al., 2018).

The previous research findings showed that the neuroimaging technique helped in understanding how the bilingual people keep the languages, and the findings depicted that they keep the two known languages in the same neural circuits (Calabria et al., 2018). Still, once the bilingual persons have learned two languages, the second language has helped activate the broader areas of a brain, and therefore, they have been partially overlapping though distinct from a native language (Abutaleb and Green, 2016; Paap and Greenberg, 2013).

More so, another study conducted by Berken et al. (2016) was applied to French-English bilinguals, in which the Functional Magnetic Resonance Imaging (fMRI) study was conducted. The findings showed areas of activations in a left temporal lobe for entire subjects at the time the native language was being used. Additionally, during the time of testing the non-language, the findings showed that there is a highly variable area of activation in hemispheres. Moreover, another study also found that area of Broca is highly activated when one is listening to a native language compared to when one is listening to any other language (Costa, 2020).

Other fMRI studies have shown that the languages are kept in the small-scale circuits yet every known language gets to have its circuit. Also, there has been another study that was conducted by Green and Abutalebi (2013). The study involved 10 Finnish-English participants aged 10 years, and the test was conducted through the use of a PET scan. As per the analysis, the findings showed that areas of activation for different languages are both in the supra-marginal gyrus and Broca's area. More so, another study conducted by Abutalebi, et al. (214) strongly found that sustainable and early bilingualism that ends up significantly affects the structure of the brain. Also, the findings showed that the grey matter's density increases in the left inferior parietal cortex of the bilinguals that are relative to the monolinguals. The density in a region has been increasing based on the proficiency of the second language as well as decreasing when the age of acquiring knowledge increases. Still, the bilingual people who learned or acquired the second language while they were less than five years had the strongest density impact. Lastly, the second language proficiency and age of acquisition have been the determinants in terms of density impact.

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Triggers of Language Interference in Bilingual's Brain

There are two languages present in the memory, but an accomplished bilingual individual can only speak in one language at a moment. To do this, their language system must choose words from the target language, while ignoring words from the non-target language (Van Heuven et al., 2008). In most cases, bilingual individuals do well in choosing the needed language, but there are times where there is intrusion by words from the non-target language, leading to the occurrence of a cross-language speech blunder (Shomstein, 2012). This ubiquitous observation shows that words from various languages rival each other in the bilingual brain. This result in a concept referred to as language interference due to conflict between languages.

According to Van Heuven et al., (2008), there are two ways through which bilinguals may address a likely language conflict: Firstly; the activation of words from the two languages that an individual can speak causes the selection of words by a language mechanism from the target language from the sample of initiated target and non-target language characterization; Secondly, there could be the total blocking of the non-target language by the mechanism to the point that there is no activation of the non-target representations. It is difficult to differentiate between language-specific lexical access and a hindered non-target language speculation. Studies have shown that words can be indiscriminately accessed from the common lexicon and that it is not possible to block non-target language (Adibnia and Chermahini, 2020).

Factors like the bilinguals' proficiency, certain language combinations, instructions, task demands, input and output modality, and certain language combinations affect the possibility of language conflict and triggering of the first (L1) and second language (L2) in bilinguals (Van Heuven et al., 2008). For instance, in tasks that require the switching of languages, there are chances of language interference since the tasks require both languages. More concrete evidence that it is impossible to avoid language interference can be achieved by observing language interference in context and tasks that utilize a single language so that bilingual individuals can shut off the other language (Filippi et al., 2020). There is also a possibility of non-target language being triggered, leading to cross-language consequences in tasks and situations that are entirely monolingual.

The possibility of linguistic interference is forecasted by word processing frameworks that take the shape of related activation of words from the dissimilar language in a combined lexicon containing words from different languages (Eben and Declerk, 2019). There should be a difference between a decision system that monitors the selection and direction for action, and a word recognition system with gain to completely combined multilingual lexicon (Fernandes et al., 2013). The orthographic, semantic, and phonological representations are activated in a bilingual individual when a visual letter set is activated. Competition between activated representation from L1 and L2 causes stimulus-based language interference. The decision-making system leads to linguistic interference since the response is chosen depending on the representations activated in the word identification system (Dash and Kar, 2014). For instance, an individual decision whether a word belongs to L1 or L2, a response conflict occurs when words from the target and non-target languages are triggered.

Investigating response-based and stimulus-based language conflict may be investigated using behavioral measurements and functional magnetic resonance. It is expected that the occurrence of language conflict would involve brain regions in executive control to deal with linguistic interference (Kroll et al., 2015). The prefrontal cortex (PFC) is the vital region related to executive control, although other areas like the basal ganglia and the medial frontal cortex are also associated with cognitive control (Aron et al., 2014). The prefrontal cortex is assumed to be engaged in several languages and cognitive-related functions like phonological retrieval, controlled semantic retrieval, and unification for language, hierarchical control, working memory and choosing of task-relevant information (Branzi et al., 2016; Seo, Stocco, and Prat, 2018)..Activations in the prefrontal cortex can be caused by language conflict. For instance, phonological and semantic representations may cause challenges in retrieval or selection.

Additionally, there is a possibility of experiencing the stimulus language link conflict due to the word identification system since there is a competition between two languages in terms of activated representations. Consequently, language interference may also prone to rise amid the time of making decisions or either at the level of the decision system (Eben and Declerk, 2019). At the level of decision system, a good example of conflict is elaborated when a person has put a point of deciding whether a certain word belongs to one of the languages or the other (Gray and Kiran. 2015). During the time of making such a decision, that is a time when the response conflict arises once the words of both non-target and target languages are activated but yet they are linked with various responses. Nevertheless, two major sources of language conflict, that is response-based conflict and stimulus-based conflict.

According to Van Heuven et al., (2008), the use of the behavioral measurements and functional magnetic resources were applied in finding how different sources of the language interference were experienced amid the time of visual word recognition. At any time, language interference was experienced; the brain was being involved in responding to the conflict. In the brain structure, there has been a key region that played a key role in performing executive control, and it has been the prefrontal cortex (PFC). It was not just the PFC that was involved in performing the controls, but other parts were also involved such as the medial frontal cortex and basal ganglia (Aron et al., 2014; Seo et al., 2018). The key functions liked with the PFC have been the language-related and cognitive functions like phonological retrieval, controlled semantic retrieval, hierarchical control, the unification of the language, working memory, and task selection (Wang et al., 2020).

Any form of language conflict that could be detected in a bilingual person has been responsible for causing an activation within a PFC. A good example of the language was being experienced during the retrieval or selection difficulties, and that might have emerged during the phonological and semantic representations of both languages, and during that time, a bilingual speaker had to select the correct ones (Calabria et al., 2018). Henceforth, in the case of information processing conflict, the medial frontal cortex and anterior cingulate cortex (ACC) have to be activated to play part in the selection of the actions to be taken. Based on the number of neuroimaging studies, the medial frontal cortex and anterior cingulate cortex (ACC) helped to assess the language translation, name tasks, and language switching (Van Heuven et al., 2008). For all the tasks that were assessed, all of them needed language control to help in selecting the correct pronunciation of the words selected in a given language.

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The need for a world translation in the bilingual brain has been triggering an anterior cingulate cortex to be activated while the language switching led to the activation of the anterior insula (Lehtonen et al., 2005). In a research study conducted by Rodriguez-Fornells et al. (2002) on a no-go vowel constant discrimination task, the bilinguals were forced to ignore the words and pseudo words linked with non-target language. During the observation, the results have shown that there was the activation of the inferior prefrontal cortex on the left and linked with an inhibition process aimed to minimize the response conflict. Additionally, embracing imaging data, both the monolinguals and bilinguals were contrasted based on their activation in the middle frontal gyrus and Pre-SMA. Based on the findings presented regarding the impact of left caudate and ACC, they showed their effectiveness in keeping the languages effective bearing that bilingual person in need of both language. Therefore, it can be concluded that the brain areas that were found having executive control in the bilingual brain are the pre-SMA, ACC, and left caudate.

There has been a focus on language comprehension by a study conducted by Van Heuven et al., (2008). The research study focused on investing the impact of response-related language interference and stimulus, especially when the bilingual brain is expected to conduct a task that requires one of the languages to be used. The single processing has been highly embraced, and an essential example used in assessing the word processing was the Dutch-English. The word processing aimed at finding out how different pronunciation and meaning are in every language. The common tools used to find out or investigate a form of language interference in the bilingual brain has been Interlingua homographs.

A great example of Dutch-English interlingual homographs as well as the set of the matched control words was used in demonstrating the stimulus-related language interference. During the time of recognizing the homographs, the stimulus-related language conflict was suspected to be detected because of existing in two languages, having different pronunciation and being semantically ambiguous. Additionally, the interlingual homographs were responsible for activating the representations in the word identification systems for both languages, and activating had a prone to result in language conflict yet with the matched English control words, there was no possibility of experiencing such form a conflict. Based on the findings, the interlingual homographs were prone to generate the stimulus level but not all were able to generate conflict at the response level. A practical demonstration of conflict levels was practiced in an English Lexical Decision (ELD) task. During the time of handling this task, the entities or participants were needed to press 'Yes' for the English word and 'No' for non-English words. For the bilinguals (Dutch-English), they were required to respond 'Yes' to English words since interlingual homographs are correct. On the other, there could be a tendency for them to report 'No' to the English words since they might also be existing in Dutch words. Thus, as a result of having a bilingual brain, there is a possibility that a language interference or conflict will be experienced, and specifically, it will be response-based language conflict due to interlingual homographs (Van Heuven et al., 2008).

Consequently, the stimulus-based conflict is also another source of language interference. A good example to elaborate it entails having the participants who will take part in the Generalized Lexical Decision (GLD). The participants were needed to press 'Yes' once the string shown is a word and 'No' when a string presented is not part of any word in the languages known. In this example, there was no possibility of the response-related conflict to take place since it was either a string of words there or not there in the languages known. Otherwise, there will be a possibility of experiencing stimulus-based language conflict. Besides, in the ELD task, the bilinguals were able to block the non-target language, and therefore there was no possibility of language conflict since no options for the Dutch language were presented. Based on two practical examples presented, it can be concluded that the parties were able to block the Dutch language to avoid any form of interference even after observing the language conflict that showed the difficulty of not blocking the language. Therefore, as a result, both languages were automatically activated.

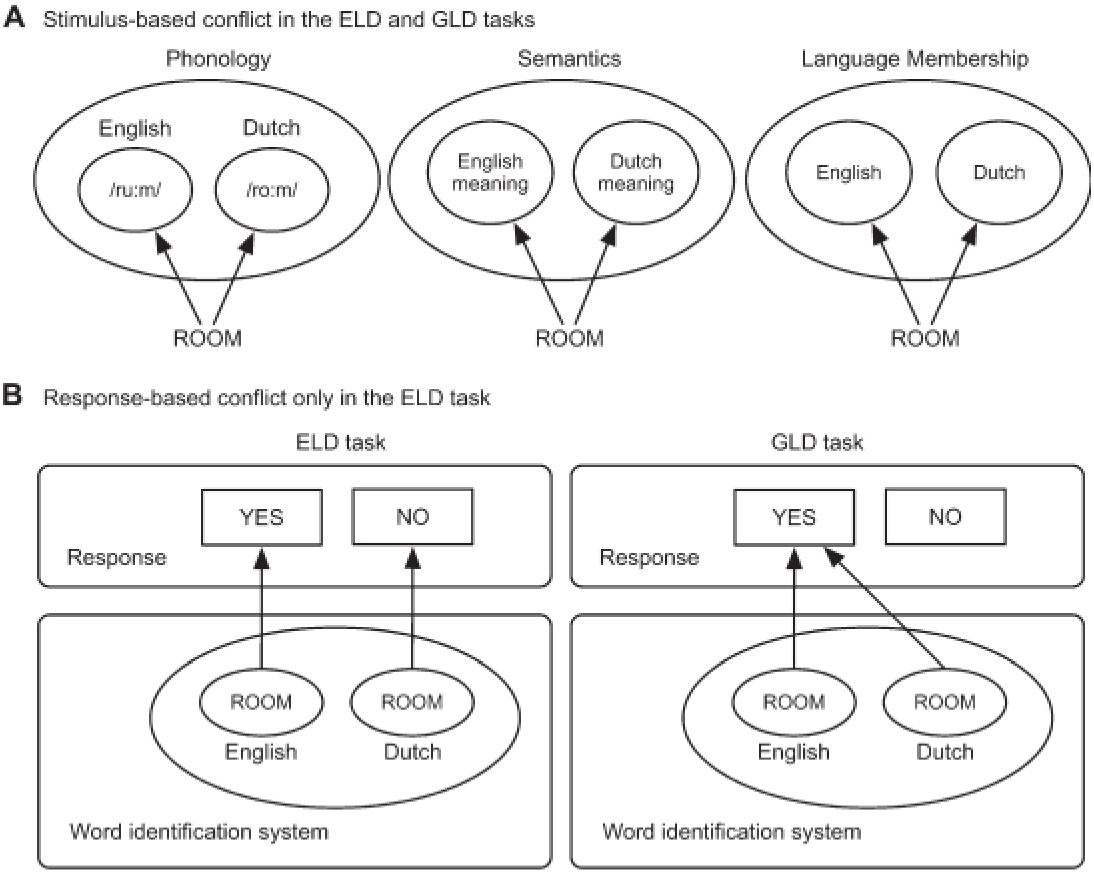

Figure 1. Sources of stimulus-based and response-based language conflicts for interlingual homographs in the ELD task and the GLD task.

Response-Related Language Interference/conflict

According to the findings by Schriefers, Dijkstra, and Hagoort (2008), ACC and Pre-SMA get activated in the ELD task but not in the GLD task since it was assessing any form of stimulus-related conflict. Henceforth, comparing the GLD task and ELD task has shown that ACC and Pre-SMA were both activated. Also, the ACC and Pre-SMA have shown that both were sensitive to the conflict based on the actions rather than on the stimulus conflict. The brain sections were responsible for the activation but the pre-SMA has been more into cognitive functioning rather than the motor-linked processes. In detail, the pre-SMA's single-neuron recording suggested that activity in the region ended up suggesting activities involved in the areas have been reflecting the processes involved in the decision-making process amid the selection of an action (Schriefers et al., 2008). For instance, in one of the speech productions experiments that were conducted, the findings showed that pre-

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SMA's anterior portion is highly involved in during the selection of words while an activation of the pre-SMA' posterior portion is linked with the strength and familiarity of the stimulus. Still, the findings also showed that the SMA-proper is highly active amid a time of executing the speech. Any language interference that has been resulting in the peak of the pre-SMA activation tends to lie off the pre-SMA anterior portion.

Nevertheless, in a study that was conducted by Nachev et al. (2007) regarding a patient who was having a lesion in the Pre-SMA yet he has an intact SMA that depicted that during the time of finding the solutions for the response language conflict, the pre-SMA is highly involved. This outcome showed pre-SMA gets involved in conducting executive control processes to handle any experienced response linked to language interference, and once the ACC is activated there is a possible response conflict. Previously, there have been ELD and GLD tasks addressed, and in those tasks, there were subcortical activations that were observed in the bilingual brain. During the assessment of the bilingual brain, activation was found in a left caudate. The cortical-subcortical network has been consisting of the basal ganglia, pre-SMA, and ACC, and they have been helpful in executive control of the processes (Schriefers et al., 2008). During the suppression and selection of the action plans, the basal ganglia were being involved. Additionally, basal ganglia have not been playing the role of controlling the movements as well as conducting the non-motor operations like language processing although it was being linked with the selection of the target language in the multilingual brain. There has been the activation of the subcortical structures during the time of translating the words in the bilingual brain. To sum up, the pre-SMA and ACC have been linked with activating the response conflict while the basal ganglia are linked with coming up with the solutions for solving the response-linked language interference.

Stimulus-Based Language Conflict/interference

Based on the study conducted by Heuven et al. (2008), in the elaborated tasks, that is, ELD and GLD tasks, the GLD task is the only task that elaborated on how bilingual brain experience stimulus is linked to language interference. The participants of the GLD were bilingual and took part in interlingual homographs. As per the assessment, the stimulus conflict never led to the behavioral differences between the English control words and homographs. Though the use of MRI data, the findings revealed that there was a strong activation in the LIPC. Also, as a result of stimulus conflict, the two clusters were activated, and between the two clusters, one was situated in an anterior of the LIPC while the other one was situated in the superior or posterior area of LIPC. In a comparison of ELD and GLD tasks, analysis depicted that small clusters in the GLD task and large cluster in ELD tasks demonstrated activation differences between controls and homographs. Thus, all areas or clusters of the bilingual brain were sensitive to the stimulus-linked language conflict. Specifically, the superior or posterior cluster of the LIPC was being linked with the processes linked with getting rid of irrelevant competing information and selecting the goal-relevant information. On the other hand, the LIPC's anterior part was associated with semantic retrieval.

Lexicality Effects

According to Schriefers et al., (2008) in performed GLD and ELD tasks, it seems the sections of IFG were highly activated by the words instead of the pseudo words, and the findings of the study showed that the monolinguals situated at the left IPG were highly activated by pseudo words compared to the words. More so, the findings of the studies conducted showed that Dutch-English bilinguals and English monolinguals both were able to activate the bilinguals yet the activation that took in monolinguals took place on right IFG while in the bilinguals took place on left IPG. Additionally, in both bilinguals and monolinguals, findings showed that the words had a prone to activate the temporal gyrus on the left side more than pseudo words. The temporal gyrus was linked in the story of the phonological words. While assessing the peak action of a temporal gyrus, it was seen that it never reached the pick thought, but it was a bit near. Moreover, activation that happened in the superior temporal gyrus situated on the right side was in the contrasts between the pseudo words and words.

Another research study elaborating the bilingual brain linked conflicts was the PET study, conducted by Hagoort et al. (1999). The study involved assessment of the German native speakers, and the contrast that existed between the pseudo words and words was the overt naming and data of silence. Still, comparing the bilinguals and monolinguals, the findings showed that the monolingual have many words being activated in the superior temporal gyrus (right side) compared to the bilinguals. During the phonological processing, it was the area that was involved as the planum temporale. In this area of phonological processing, the area is being recognized for being more active to bilinguals more than monolinguals especially when the bilinguals use the sub lexical route for access. Thus, in English monolinguals, the phonological processing seemed to happen more bilaterally and is more of the left side of IFG. Additionally, contrasting the monolinguals and bilinguals, the findings showed that strong activation of the words was taking place more in the left IFG from the bilinguals unlike in monolinguals. In the bilingual brain, the huge mental effort was highly needed during the time of phonological and semantic processing thus leading the left IFG to be strongly activated.

Pros and cons of bilingualism

Being a bilingual can enhance communication by expanding the social circle. In addition, it can help in increasing job opportunities and creativity, as well as having more cognitive flexibility while switching between two different language systems. These people who are bilingual or multilingual have some positive effects in their brains, which even change the way they view and interact with the world. For example, bilinguals have a higher density of gray matter that contains most of the neurons and nerve connections of brain. Recent research shows that people who have learned a second language exhibit fewer emotional biases and a more rational approach when they encounter problems.

In fact, when a bilingual person hears words in one language, activation occurs in the other language as well. Some Scientists (Luk and Bialystok, 2013) believe that the brains of the bilingual people adapt to this constant coherence of the two languages, and therefore their brains are different from the brains of people with a monolingual language. In monolingualism, this "phonological competition" only occurs between words from the same language. But in bilinguals, phonetically similar words from their second language also add to the mix.

In monolingual people, the linguistic regions, and more specifically the "left supramarginal gyrus" and "left inferior frontal gyrus", are activated when confronted with the process of "phonemic competition". The results of the study contacted by Marian, et al. (2017) show that different areas of the brain are needed to deal with vocal competition from within the same language, compared to phonological competition between languages. This means that there is some mechanism in the brain that occurs to help facilitate vocal competition in bilingual or multilingual people.

The size and type of neural network that bilingual people recruit in the brain to solve the problem of "vocal competition" varies according to the source of competition (Cohen-Goldberg, 2012; Donna et al., 2012). This indicates that the great neuroplasticity enables bilingual owners to process speech despite language competition from multiple sources. This adaptation is called "neuroplasticity," or the brain's ability to adapt to the environment and new experiences, and it is critical for cognitive performance.

However, some of the negative aspects can affect the linguistics skills as human beings have a certain potential capacity in language learning, and it may affect the proficiency, unlike monolinguals. Moreover, bilingual brain can find difficulty in preventing language conflict.

RESULTS AND DISCUSSIONS

It can be noticed from the present study that the best person to master languages is a bilingual. Stimulus-based and response-based are interacted in two different brain regions, simultaneously. Conflicts of Both processes rise when bilinguals are engaged in translation and decision making because two or languages are activated automatically and differently engaged. The results shed light on the neural mechanisms that support decision making when a certain conflict occurs. Discussion density impact is considered the determinant of the second language proficiency and age of acquisition. Findings showed that the neuroimaging technique helped in understanding how bilingual people keep the language in the brain. Additionally, stimulus and response conflicts in the bilingual brain were introduced to elaborate how both can disrupt behaviors by slowing response times or decreasing accuracy. For example, as the figure (1) mentioned; conflicts of interlingual homographs in the ELD task and the GLD task were visible at the levels of phonology and semantics in bilinguals who speak Dutch and English. Moreover, this involves only one of their languages, using a single word with same spelling but different pronunciation and meaning. Bilinguals faced the problem related to stimulus-based language conflict because there are two languages aspects to face i.e.,. the meanings are ambiguous and the pronunciations are differ.

CONCLUSION AND RECOMMENDATION

In order to have a successful decision making in a complex environment its naturalistic to face a number of conflicts. The present study demonstrates the two brain regions presented the task of decision making which is related to both stimulus-related and response-based conflicts. It also emphasizes learning a second language includes both languages activated and by that, bilinguals cannot prevent the non-target language to avoid interference. The bilingual people are known for knowing more than one language, and for one to accomplish this task, the bilingual is expected to select the words from a target language. Amid the time of selecting the target language, a bilingual at times is prone to experience a word from non-target language and as a result leading to cross-language interference. Thus, from the common observations and research findings, the bilingual's brain gets subjected to varieties of words from different languages that are prone to affect each other.

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Thus, interference is being termed as the primary language conflict. There are different triggers of language conflicts that are being experienced by the bilingual people; the common language conflicts have been response-related language and stimulus-based language conflicts. These two forms of conflicts were hard for the bilingual brain to avoid since during the selection of words from target language and the non-target language was activated simultaneously; therefore, by the end it leads to cross-language interference since both sections of the brain were activated to operate.

RECOMMENDATION

According to the study results and discussions, the following recommendations are provided:

Many studies have propagated the linguistic interference in the bilingual's brain, but little research was done to focus on how various languages rival each other in the bilingual brain process. Further, this study can also be investigated through different approaches. Another recommendation is that more studies should be done to investigate both internal and external interference and how it can be a challenge for bilinguals and taken more seriously for their way of offering a commentary on societies, cultures, governments, and the use of advanced science for the benefit of humans and earth

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