A Cognitive Approach on Bidirectional Language Transfer: How to Figure Out the Ground?

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The Asian Conference on Language Learning 2015
Official Conference Proceedings

Abstract
The purpose of this study is to examine bi-directional language transfer between Mandarin Chinese and English from a cognitive approach. While previous studies mostly focused on "transfer" from habit of L1 (Kleinmann, 1977) or avoid to use the form of L1-L2 difference (Laufer and Eliasson, 1993), our research questions are: Does bidirectional language transfer exist? And how is it correlated with L1 and L2 proficiency. We conducted a cognition-based experiment with 33 participants using picture description task (Isurin, 2005) to test the 'figure-ground' relationship in L1 Mandarin and L2 English.

The results interestingly showed that transfer occurred especially in learners of higher L2 proficiency level. We provided explanation through cognition and Krashen (1982)'s Monitor Model. As an example: advanced L2 English learners displayed much higher tendency of cognition pattern shift from L1 Mandarin since they had sufficient knowledge to create an English sentence reflecting the Mandarin pattern but at the same time grammatical according to their L2 interlanguage.

As conclusion, language habits are strong. That is why L1 transfer to L2. However, with the increased L2 experience, the L2 pattern will also influence one's cognitive system, resulting in bi-directional transfer.

Keywords: Bidirectional language transfer, Cognition, Chinese, English

Introduction

This study is motivated by the interaction between Mandarin and the worldwide lingua franca English. Along with the increased usage of English, learners may go through transfer effect. It is traditionally expected that L2 will be influenced by L1 but recent research also studied the opposite direction that L1 is influenced by L2. In our study, we examine bi-directional language transfer between Mandarin Chinese and English through a cognitive approach to avoid the influence of experimental factors such as syntax complexity.

Our research questions are: 1) Does bidirectional language transfer exist? 2) Is the language transfer from L1 negatively correlated with L2 language proficiency (L1->L2, the lower the proficiency of L2, the higher possibility of influence from L1 to L2)? 3) Is the language transfer from L2 positively correlated with the L2 language proficiency (L2->L1, the higher the proficiency of L2, the higher possibility of influence from L2 to L1)? The content is divided as follow: Section 2 includes the literature review and section 3 represents the method of our study, while section 4 provides our results followed by discussion and limitations in Section 5 and 6. Finally, the conclusion is drawn in section 7.

Literature review

Since behaviorism, the notion of "transfer" (Lado, 1957) or "cross linguistic influence" (Kellerman & Sharwood Smith, 1986) has been widely discussed in the linguistic field. Generally, it states that "the learning of task A will influence the learning of task B" (Gass and Selinker, 2008), therefore leading to positive or negative results in Second language acquisition (SLA). Within this direction, it has been a subject of controversy since it is hard to determine if the error or unusual usage produced is being transferred from L1, citing as an example Fries (1957) and Postman (1971) highlighting the role of L1. However, George (1972), Dulay and Burt (1975) or Richard and Sampson (1974) among others had more skeptical opinion. They argued that fewer than 5% of errors were due to native language interferences while most of errors were developmental. This divergence was mainly caused by different interpretation of experimental results. This is also why we propose in our study a novel method to exclude this issue.

On the side where transfer is supported, previous studies first relied on the contrastive analysis hypothesis (CAH), such as Hakuta (1974b) and Larsen-Freeman (1975a, 1975b) who focused on the different learning result process of Japanese. Also, Schachter (1974) and Sjoholm (1976) demonstrated that Finnish speakers learning English made errors traced back to their L2 (Swedish) rather than to their L1 because it was more similar to English, which supported that transfer did occur. Another approach among others was Avoidance: Kleinmann (1977) showed that participants chose to use certain structures over others depending on their habit of L1. And as Laufer and Eliasson (1993) concluded also, the best predictor of avoidance is the L1-L2 difference: in their experiment Hebrew speakers avoided phrasal verbs (ex: back up, come down) and used single-verb synonyms since their own language did not have the first category. These results being in concordance with semantics studies of Slobin (2004) toward expression of motion events, which proved that indeed: language habits are strong. As a summary, the traditional approaches did have their

advantages but also weaknesses in explaining transfer. Due to this reason, within recent studies, two novel perspectives have been appearing: L2 to L1 transfer and cognitive approach.

The first is investigating the influence of L2 on L1. This is quite new since previous studies were mainly assuming that only L1 could be strong enough to affect L2. From syntactic point of view, Hsu (1994) and Gao (2005) demonstrated that "Englishization" of Mandarin Chinese was occurring in offline and online context, symbolizing the impact from English on Chinese in computer-mediated communication. As an example in (1), on the syntactic level part of speech or word order can be affected, in a), the noun (電話, telephone) is used as a verb. In b), the adverbial time phrase (明年, next year) is moved from before the verb phrases (去美國, to America) to after it.

(1) L2 English affecting L1 Mandarin

a.有空電話我。 (Mandarin)
You kong dian hua wo
Have time telephone me
'Call me if you have time.'

b.我去美國明年。 (Mandarin)
Wo qu mei guo ming nian
I go America next year
'I am going to the US the next year.'

In the field of phonology, similar results were obtained by Jiang (2008), who demonstrated that English learning lead to Mandarin-English bilinguals carrying some English characteristics in their L1 Mandarin vowel production.

The second new subject is the cognitive approach, where researchers assume that human cognition is driving our language, and provides new methodologies in experiment. This direction mainly focuses on the speech style related to cognition. Larrañaga, Treffers-Daller, Tidball, Ortega (2011) studied the longitudinal influence of L1 on L2 within English speakers learning Spanish. The important point is that they realized that path was acquired easily for its presence in both languages but the encoding manner did pose difficulties to learners due to its much lower frequency in Spanish. Garcia-Mayo (2012) also provided an analysis of L3 acquisition study through a cognitive point of view. And Snape et al. (2013) demonstrated through an analysis of generic noun phrases (NPs) in four different languages including English, Spanish, Turkish and Japanese, that L2 speech style was influenced by L1.

Finally, some linguists combined the two novel approaches, Isurin (2005) studied the effect of L2 English on L1 Russian through an analysis of speech style, demonstrating that L2 learners tend to adapt the syntactic structure of a new language to that of their native language and/or avoid redundancies by generalizing the rule where irregularities are minimized. As a summary, novel approaches including transfer from L2 to L1 and cognitive-based methodology provided a new insight for second language acquisition studies. Nevertheless since it emerged recently, we still have

some space to conduct a more detailed analysis. This will be the main direction of our research.

Method

We followed the research of Schachter and Rutherford (1979). They analyzed written output of Chinese and Japanese speakers learning English, observing a high appearance of topic related forms, such as a high presence of "there is" or "there are" sentence pattern, e.g "there is a small restaurant near my house in my country". This was supposed to come from a particular discourse function from L1. Also, based on Isurin's (2005) research containing three tasks, semi-spontaneous speech, picture description, and story-telling to test the possible syntactic changes (e.g. word order) between Russian and English, we adopted the picture description task, to test where the cognitive "focus" is in a sentence.

Our study differed in the way that: First we chose speech form rather than written form. Second, we included the two directions of possible influence combinations (English to Mandarin & Mandarin to English). Third, according to Dagut and Laufer (1985), certain forms of L2 may be dispreferred by learners due to the complexity. Thus we adopted a cognitive approach and did not target structure details but "focus ordering" within it. We were then able to narrow down the influence of other factors such as context or grammar complexity since they were unified on a basis of cognition. In our research we made identical the parameters other than L1, as an example: we involved a picture description task representing a book on a table. From semantics point of view, the cognitive image schema composed of figure and ground is identical between different languages, only their ordering could vary, as explained by the principle of Gestalt and Pragnanz.

The main scope for determining language transfer was by where the Figure would be positioned in the sentence. Nevertheless, to avoid the expression difficulty on learner's side and at the same time the weak point of previous studies, complex or detailed syntactic forms would not be considered in our analysis. According to Li and Thompson (1981), Mandarin was termed as a topic-prominent language since in addition to the grammatical relations of "subject" and "direct object" the description of Mandarin also included the element "topic". That is why we chose to examine the focus of topic in a speaker's language behavior. It may however be arguable that this would cause a problem to this experiment since we rely on word ordering but thanks to Slobin (2003), we avoided this issue. He proposed the concept of "thinking for speaking" in which cognition plays a dynamic role within the framework of linguistic expression. In other words, when constructing utterances in discourse, one would fit his thoughts into available linguistic forms. As a result, in our study, we simply examined what our subjects first chose in their speech as the proof of one's cognitive preference and excluded the influence of context.

We did not investigate the detailed variation of phonological transfer processes and results because it would be too difficult to measure the interaction between various factors. And it did not influence our data since we only focused on topic position in sentence. Morphology was not intervening either, due to the fact that there was no obvious morphological transfer between L1 and L2. On the pragmatic side, Odlin & Alson-Vazquez (2006) and Odlin (2008) demonstrated that conceptual transfer may

occur between L1 and L2, this is why we chose the cognitive level of figure and ground as the parameter to avoid too complicated factors in the equation. Interlanguage transfer (L2 influencing L3) has also been the target of previous studies such as de Groot and Hoeks (1995), where different proficiency resulted in various lexical-semantic organizations in our mind (e.g. mind-L1-L2 or mind-L1&L2). We did not examine this dimension here to prevent from discussing too many issues at once; moreover, this kind of interference could be easily excluded by filtering participant background. Young (1991) and Hyltenstam (1977) also demonstrated the importance of systematic variation within the learning process and the influence of L2 proficiency in their studies. This is why we had different proficiency groups in our experiment.

Participants

In total, 33 people who learned English in formal educational system were chosen and divided into three experimental groups conforming to different levels of English proficiency. The proficiency level was decided in terms of most common English standard test in Taiwan, such as GEPT, TOEIC, and TOFEL, in agreement with CEF (Common European Framework) announced by Ministry of Education. For basic level, participants are beyond intermediate level in GEPT, under 550 points in TOEIC, or beyond 57 in TOFEL. For intermediate level, participants are between intermediate and advanced in GEPT, from 551 to 780 points in TOEIC, or from 58 to 87 in TOFEL. For advanced level, participants are over advanced level in GEPT, more than 781 points in TOEIC, or higher than 87 in TOFEL. We assumed that the production of these 33 people could represent the interference of L1 and L2 from two directions. Groups were shown respectively in Table 1:

Speaking Mandarin (L1)	Speaking English (L2)	English Proficiency (L2)
	10	Basic
	10	Intermediate
	12	Advanced
10		Basic
11		Intermediate
12		Advanced

Table1. Source of data for participants

An important point needing explanation is that we did not gather control groups, since previous studies such as Chan (2004) already proved the prominent pattern of existential functions within English and Mandarin. As shown in (2).

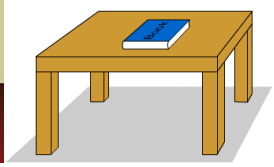
(2) Existential clause prominent pattern

a.There is a book on the table (English)
b.桌上有一本書 (Mandarin)
zhuō shàng yǒu yì běn shū
Table on have one CL book
'On the table is a book'

Experiment

Participants were asked to describe what they observed in the picture (a book on a table) as in (3a) during 1 minute in L1 (Mandarin) and three days later, participants were asked to describe another picture (also a book on a table) in L2 (English), as shown in (3b).

(3)a. b.



We used different pictures to avoid direct translation from our participants. Participants would be hinted before they described. The clues were consisted of filters such as the color of items, the number of items, and the target topic: the position of items to make sure that the target topic could be extracted without being penetrated by participants. All the production was recorded and the figure-ground sentences were identified and transcribed into Pinyin and English translation respectively. The data were separated into two categories: L1 transferring to L2 and L2 transferring to L1, then analyzed.

Results

As a reminder, our research is composed of three questions: 1) Does bidirectional language transfer exist? 2) Is the language transfer from L1 negatively correlated with L2 language proficiency? 3) Is the language transfer from L2 positively correlated with the L2 language proficiency? Through one on one interview, our experiment gathered a total of 65 tokens instead of 66 (1 token in English spoken data was damaged), each one representing a spoken description in English or Mandarin of the "book on the table" and lasting 1 minute in average. Within these results, we first analyzed the positioning of the figure (the book) and ground (the table) inside the utterance to verify the existence of transfer.

For the first research question, we refer to Figure 1 and 2. In Figure 1 we can see that in Mandarin speech, the occurrence of shifting between figure and ground is increasing along with the English proficiency. In other words, the more evolved the English ability, the higher amount of participants who changed from preferred mandarin pattern of "first table then book" (ground-figure) to transferred English pattern of "first book then table" (figure-ground). Basic level of L2 learners did have half less appearance of the phenomenon, only 30%, but increasing to 50% in their intermediate or advanced level counterparts. A sample of Mandarin speech with English pattern is also provided in (4).

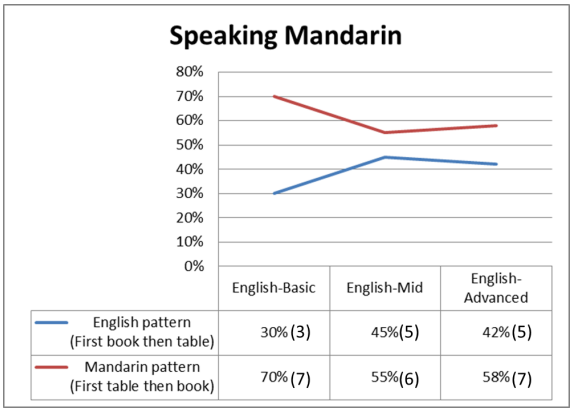


Figure1. Participants speaking Mandarin

(4) Transfer from L2 English to L1 Mandarin
這裡有一本書放在桌子上 (Mandarin)
zhè lǐ yǒu yì běn shū fàng zài zhuō zi shàng
Here have a CL book put table on
'There is a book on the table'

A similar effect is observed in Figure 2, but in a different direction. We can see that in English speech, beginners and mid-level learners did not show a strong tendency of figure-ground shifting, only 20% and 0%. However, high-proficiency English learners displayed 50% of shifting. Showing that before reaching a high level of proficiency, the learners respected the preferred pattern of English with "first book then table" (figure-ground), but at a higher level, they came back to the prominent manner of their mother tongue, reflected by "first table then book" (ground-figure). The levels of representation were however different between both directions. This part will be explained by our two other research questions. A sample is displayed in (5).

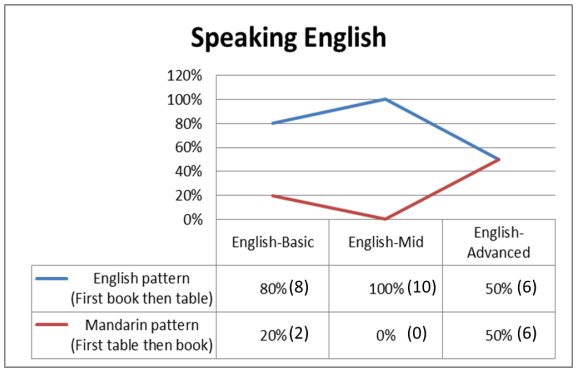


Figure2. Participants speaking English

(5) Transfer from L1 Mandarin to L2 English
There is a green table with a green book on it. (English)

For our second research question, we supposed that the language transfer from L1 would be negatively correlated with L2 language proficiency. Through Figure2 we analyzed the transfer frequency from Mandarin to English. Results displayed that the phenomenon of pattern switching from Mandarin increased along with the English

level of participants. As an example: lower than 20% of learners displayed transfer within English basic level and intermediate level groups. However, the ratio augmented to 50% in the participants of advanced-level English proficiency. This result turned out to be in contradiction with our expectations. Nevertheless, it is still supporting our main hypothesis. More details will be explained in the discussion section.

For our third research question, we expected that the stronger the L2, the higher the possibility that it invades L1. The result of Figure1 shows that in basic level of English, the L1 cognitive pattern is still strong, keeping a 70% of the frequency. However, when reaching intermediate and advanced levels of English, our second language has higher tendency (50%) to influence speech. This seems to be in accordance with our suppositions but still requires further explanations, which will be provided in the next section. Moreover, another step was made to increase the significance of our analysis. After comparing the priority ranking between figure and ground (book and table) within learners' cognition, we extended the scope to the speech pattern of our subjects to check if this figure-ground relation was also applied within the entire description manner. The analysis showed that in 85% (55/65) of the time, the describing manner between figure and ground was similar to the speech pattern of the participant, whether in English or Mandarin. As an example, if the speaker described first the ground then the figure (first table then book) in his main utterance, the entire speech followed the same "from big to small" logic of pattern. The speaker described first the ground (the big things) then narrowed its sight to smaller elements, as demonstrated in (6). The speaker started from the entire room, went through the description of wall and floor, reached the table and finally arrived at the book and its cover.

(6) Pattern from ground to figure (English)
In a room with yellow and green wall and a dark red floor, there is a table. On the table you can find a book which has a green cover.

The similar pattern was observed in Mandarin also, as demonstrated through (7). Where the speaker started by describing the book then extended his view to bigger elements, such as table, and finally reached the entire room.

(7) Pattern from ground to figure (Mandarin)
有本很厚湖水綠的書放在四隻腳的桌子上,這張四隻腳　的桌子感覺就是放在房間的中央…
yǒu běn hěn hòu hú shuǐ lǜ de shū fàng zài sì zhī jiǎo de zhuō zi shàng, zhè zhāng sì zhī jiǎo de zhuō zi gǎn jué jiù shì fàng zài fáng jiān de zhōng (Pinyin)
have CL very thick lake water green book put at four leg of table on, this CL four leg of table seem is put at room of middle
'There is a very thick, lake-green colored book on a four-legged table, this four-legged table seems to be in the middle of the room.

By narrowing down the scope to speech in Mandarin, we can see in Table 3 and Figure 4 that the majority displayed the mandarin pattern (55%) of big to small (table to book). The English pattern is taking more shares according to the proficiency of learners in intermediate-level (45%), but at advanced level, they also tended to use both approaches for description.

	English-basic	English-intermediate	English-advanced	Total
Big to small	60%(6)	55%(6)	50%(6)	55%(18)
Small to big	30%(3)	45%(5)	33%(4)	36%(12)
Both	10%(1)	0%(0)	17%(2)	9%(3)
Total	100%(10)	100%(11)	100%(12)	100%(33)

Table3. Cognitive Direction Pattern When Speaking Mandarin

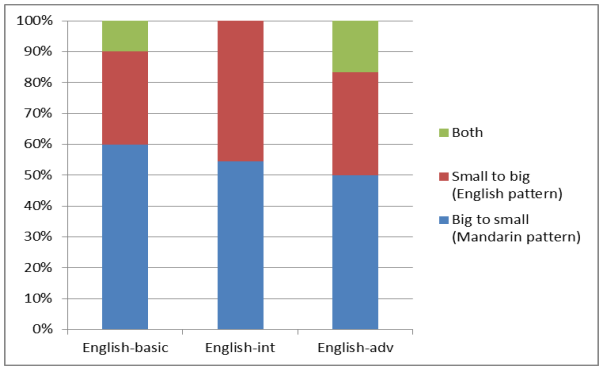


Figure4. Ratio of Cognitive Direction Pattern When Speaking Mandarin

On the other hand in Table 4 and Figure 5, English speech also had higher rate from its own pattern of small to big (50%). However we can see that along with the increase of English proficiency: first, the number of speakers using Mandarin pattern increased steadily from 0%, 10% to 25%. Second, more learners used both Mandarin and English pattern at the same time during their description, growing from 20% to 70% between basic and intermediate-level.

	English-basic	English-intermediate	English-advanced	Total
Big to small	0%(0)	10%(1)	25%(3)	13%(4)
Small to big	80%(8)	20%(2)	50%(6)	50%(16)
Both	20%(2)	70%(7)	25%(3)	37%(12)
Total	100%(10)	100%(10)	100%(12)	100%(32)

Table4. Cognitive Direction Pattern When Speaking English

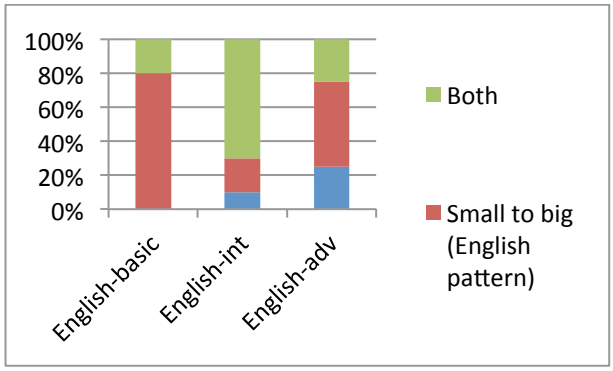


Figure5. Ratio of Cognitive Direction Pattern When Speaking English

As a conclusion for the result part, our predictions toward the existence of bi-directional language transfer turned out to be correct, but an interesting unexpected point was the fact that higher proficiency L2 English speakers underwent more transfer from their L1 Mandarin. Detailed explanations are provided in the following section.

Discussion

In this part, we will discuss our three research questions with ~~use~~ the obtained data. As previously mentioned in our method, each explanation will be divided into two steps: the first one being discussion through the scope of figure and ground, the second being extended to the range of speech pattern (from small to big or the opposite way.)

Research question 1

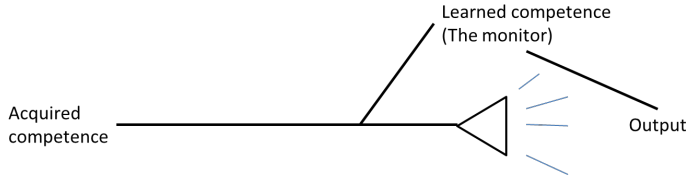
Following the results displayed in Figure 1 & 2, we realized that language transfer did occur in both directions. In Figure 1, native speakers of mandarin applied the cognition pattern of English when speaking Mandarin. In other words, the preferred concept in mandarin existential clause should be ground first then figure (table first then book); however speakers with higher proficiency of English as L2 showed an increasing usage of English existential clause pattern, composed of figure first then ground (book first then table). We could see from the statistics that 50% of mid and advanced level learners displayed the English pattern, in contrast with only 30% in basic level. On the other hand, transfer was also noted in Figure 2 by the opposite direction. Mandarin native speakers used their mother tongue pattern of ground first then figure (table first then book) when speaking English.

When enlarging our scope to the entire speech level, we analyzed the data in Table 3 & 4. The output supported our result on the figure-ground level: bidirectional transfer did occur. In Table 3, 40% of the speakers adopted English pattern (from small to big) in Mandarin speech. This ratio is nearly identical with the ground-figure percentage. Similar case is observed in Table 4, where 50% of English learners used Mandarin pattern (from big to small) in their English speech. As a resume, we can assume that the evidence is strong enough to support our expectations toward language transfer. However, further details need investigation through our two other research questions.

Research question 2

Our second research question was: Is the language transfer from L1 negatively correlated with L2 language proficiency (L1->L2, the lower the proficiency of L2, the higher possibility of influence from L1 to L2)? Through the analysis of Figure 1 & 2 we found that our prediction turned out to be incorrect: Basic and mid-level learners only had 20% and 0% of transfer, but advanced level learners used Mandarin pattern (table first then book) during English speech 50% of the time. Our explanation toward this anomaly is based on the Monitor Model of Krashen (1982), as displayed in (8). In this view, the learned system of L2 will serve as a controller and alter the output of the acquired system. In other words, the Monitor filters out the ungrammatical sentences and disallows them to surface out in speech output. This model has been the subject of controversy during previous studies, especially toward the definition of appliance and acquisition VS. learning differences. However, since it is not the main theme of our analysis, it does not affect our research.

(8) Krashen's Monitor Model



Explaining our data in Figure 2 based on Krashen's approach, we assume that in basic and mid-level, learners did not have sufficient knowledge as the monitor to excluded the output with mandarin pattern (table first then book) and could not create a sentence reflecting the Mandarin cognition pattern but at the same time grammatical according to their interlanguage. However, when learners reached advanced level, they found a way to fulfill these two criteria as demonstrated in (9). It resulted in a high tendency of Mandarin pattern in English speech.

(9) Advanced English learner L1 transfer (English)
It is a table and there is a green book on it.

This explanation is also supported when we enlarge the scope of analysis to the entire speech in Table 4. The ratio of speakers using the mandarin pattern of big to small in English speech is increasing from 0% to 25% along with the English proficiency. As demonstrated in (10). The more capacity they had, the easier English learners could reflect the pattern of their native language in speech.

(10) Advanced English learner L1 pattern (English)
I can see a room with red floor and green wall and I see a table… and a green book.

Our hypothesis is further supported by previous study of Pienemann and Johnston (1987), where they supposed that the learning process of a new language is constrained by specific steps, which cannot be bypassed. It mainly starts with a canonical order such as SVO: 'You are student?'. Only few stages later will it evolve into the capacity of complex movement within the sentence, such as 'You are not a

student, are you?'. In our point of view, this is exactly what is limiting the production of basic and mid-level learners in their English speech. They did not reach the advanced stages of development yet, therefore they don't acknowledge the possibilities of movement to express the Mandarin cognition pattern through English. Due to this reason they are left with only one option: following the English pattern. This situation is changed when they arrived at advanced level where their interlanguages allow complex movement within the clause. As a resume, for our second research question, even if our prediction turned out to be wrong, the result still supports our main hypothesis. Moreover, the observed phenomenon can be explained though the monitor and word order development constraint. However, did the same situation occur in both directions? This is explained through our third research question.

Research question 3

Our third research question was: Is the language transfer from L2 positively correlated with the L2 language proficiency? Based on the results in Figure 1 we can acknowledge that our prediction was correct: The higher L2 proficiency, the stronger transfer from L2 when speaking L1. In learners of Basic English level, only 30% displayed the usage of English pattern (figure first then ground), but this ratio augmented to 50% in mid and advanced level. Similar variation is obtained by enlarging the scope of analysis to the speech level, where more speakers tend to use the English pattern (Small to Big) when having higher English level.

Nevertheless, one question may arise: if by research question 2 we acknowledged that language transfer was stronger from L1 Mandarin to L2 English with advanced learners, how come similar situation is encountered in the other direction? This implicates that when learners have a high proficiency of L2, both L1 and L2 have a strong transfer influence on the other language. This result could be viewed as contradiction but can be explained through our cognitive approach. From the cognitive view, it is proposed that the distance between grammar and cognition may vary between languages (Langacker, 1987 & 2008). In our case, English is a language with deeper grammar, meaning that the grammar is more formalize, therefore constraints on syntax will also be stronger. On the other hand, Mandarin has more connection with cognition, meaning that it will directly reflect the cognitive experience of the speaker rather than being dependent on fixed grammar. As a summary, the common ground between languages is the universal cognition of their speakers. This could explain why the pattern seems stronger when transferring from L2 English to L1 Mandarin: it is due to the fact that English is deeper in grammatical domain. English has a stronger influence compared to Mandarin, which is based on cognition.

Limitations

Since only 33 subjects participated in our study and 65 tokens was not enough to show an obvious tendency, more subjects for each proficiency levels and for the two control groups are needed in order to increase both reliability and validity. However, in this study we only examine the bi-directional transfer in Mandarin learners of English. As a result, we recommend further studies to examine the parallel questions

of L1 English speakers learning L2 Mandarin. If the results show the same pattern, it can support that cognitive transfer effect is a universal phenomenon.

Conclusion

First, 50% of advanced level learners used the Mandarin focus pattern (ground first then figure) of existential clause during their English speech and 50% of mid and advanced level learners applied the cognition pattern of English (figure first then ground) when speaking Mandarin. This pattern was supported when analyzing the speech pattern as a whole. As a result, bi-directional transfer did exist in different context.

Second, the higher L2 proficiency, the stronger transfer from L2 when speaking L1, but L1 transfer to L2 occurred in higher frequency within advanced level learners of L2. It could be explained by Krashen's theory. Advanced level learners displayed a much higher tendency of cognition pattern shift since their proficiency provided sufficient knowledge to create a sentence not only reflecting the Mandarin cognition pattern but also grammatical according to their interlanguage. On the other hand, the output of basic and mid-levels learners was filtered by the Monitor. Last but not least, the contradiction when learners have a high proficiency of L2, both L1 and L2 transfer on the other language can be explained through cognitive approach. Langacker (1987 & 2008) proposed that the distance between grammar and cognition might vary between languages. In our cases, English grammar has stronger constraints on Syntax while Mandarin directly reflects the cognitive experience of the speaker rather than being dependent on grammar.

In conclusion, language habits are strong. That is why L1 transfer to L2. However, from cognitive view, language is based on cognition and cognition itself is based on one's experience. Along with the increasing L2 experience, the L2 pattern will also influence one's cognitive system, resulting in bi-directional transfer.

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