Effects of L2 on the L1 at Semantic Level: An Empirical Study

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Abstract—**Language transfer is a bidirectional phenomenon, which includes not only forward transfer but also backward transfer. Recently, backward transfer, also seeing as effects of L2 on the L1, has gaining attention in the field of SLA. Taking tag questions as an example, current study aims to enrich backward transfer study with a tentative research on the influence of English (L2) knowledge on Chinese (L1) in the light of Multi-competence Theory from SLA perspective. A questionnaire with assurance-doubt task (40 items) is made and 101 university students are recruited to fill it out. The data are analyzed by SPSS 18.0. Results proved the influence of English knowledge on that of Chinese at semantic level. Besides, the improvement in metalinguistic awareness is found in English major students.**

Index Terms—**backward transfer, multi-competence, tag question, semantic, metalingusitic awareness**

I. INTRODUCTION

The effects of the L2 on L1 are known as the influence of a person's knowledge of second language on that of his or her first language. There are many terms relate closely to it, including L2 influence, reverse/backward transfer, bidirectional transfer, interference, interlingual effects, crosslinguistic influences, cross language transfer, cross language influence (Cook, 2003; Seliger & Vago, 1991, p.6). In the field of SLA, L2 effect study equals to backward transfer study to a certain degree, so in this study L2 effect and backward transfer are used alternatively. Besides, it also relate closely to L1 attrition study, as L2 effect is usually considered to be a cause for L1 attrition. Vivian Cook is a prominent scholar in the field of L2 effects. The Multi-competence theory purposed by him has become the dominant supporting theory of L2 effects study. The effects of the L2 on L1 has been discovered and proved at phonetic (Zinszer et al., 2015), morphsyntactic (Balcom, 2003), lexical (Laufer, 2003), semantic (Pavlenko, 2003), pragmatic (Abu-Rabia, 2013), rhetorical (Kecskes & Papp, 2000), and conceptual (Kescskes & Papp, 2003) level. However, most of the researches have been done in L2 dominant environment with balanced bilinguals, few discussed the L2 effects in L1 environment with L2 users who have scarcely any exposure to L2 culture. This study, therefore, aims to reveal possible L2 effect in L1 environment with unbalanced L2 users.

II. MULTI-COMPETENCE THEORY

Multi-competence Theory is of primary importance in the field of backward transfer without dispute. Firstly proposed by Cook (1991), the term is created to describe precisely a bi/multilingaual's knowledge of the "combination" of the languages he or she acquired. He argues that former scholars usually use interlanguage to refer to bi/multilinguals' knowledge of non-mother tongue while no term was available to emphasis the special mental state of bilinguals' mother tongue or the synthesis of different languages.

He clearly defined Multi-competence as knowledge of two or more languages in one mind, thus the whole mind of the bilingual is involved, rather than simply their first language or their second language (Cook, 2012). In order to avoid the misleading that Multi-competence only applied to research at individual level, Cook further developed the definition as the overall system of a mind or a community that uses more than one language (Cook, 2013). The most insightful point for Multi-competence in the field of SLA is that it questioned the stability of mother tongue and argued for the right of L2 users. For application, Cook also pointed out three particular researches inspired by the concept of Multi-competence, one of which is to see transfer as a two-way process allowing L2 influence on L1 (Cook, 2013).

III. EFFECTS OF THE L2 ON L1 AT SEMANTIC LEVEL

Under the name of "loan words" or "borrowing words", the effect of L2 on L1 at lexical and semantic level has been looked closely and deeply from various study perspectives of socio-culture, SAL, and bilingualism, to name just a few. The discussion here will be limited to studies in this field targeted at individual bilinguals or L2 learners.

Pavlenko & Jarvis (2002) looked into the narrative performance of 22 Russian-English bilinguals and detected

semantic reverse transfer of semantic extension, lexical borrowing, and loan translation. A similar finding of semantic extension was detected again by Pavlenko's (2003) study. The broadly borrowing effects of L2 are reported by other researchers such as Latomaa (1998) and Boyd (1993), who investigated the speech of Finland-Americans and late Finnish-Swedish. Several researches reported lexical retrieval difficulties of L1 or reduce of lexical diversity (Laufer, 2003).

As to the constraints of the L2 effect, Laufer (2003) found that age of arrival, length of residence, and the amount of use of L1 (Russian) were proved to have an impact on the results of L2 effects while the use of L2 (Hebrew) had no influence to bilinguals performance. A study conducted by Van Hell & Dijkstra (2002) found backward transfer only in L2 users with high proficiency.

Besides, there are documents failed to detect the influence of the L2 to the L1. In Porte's (2003) research, 3 expat teachers, with English as their mother tongue living in Spain at least 15 years, enrolled in the investigation. Only code-manipulation and code-mixing were found in their speech which can not sufficiently use as L2 effects evidence. While the study conducted by Dewaele & Pavlenko (2003) showed no difference between Russian-English bilinguals and Russian monolinguals on productivity and lexical diversity.

To sum up, L2 effects on L1 is shown as semantic extension, loan translation, language borrowing, as well as retrieval difficulty at semantic level.

IV. ENGLISH TAG QUESTION AND CHINESE TAG QUESTION

Tag question (TQ) belongs to the interrogative sentences and exists in many languages around the world as a common colloquial form. The definition of tag question was given based on the form it takes. Formally, tag questions refer to the sentences combined by two parts: a statement (or a clause) and a tag appended to it, seeing (1) (2):

(1) The boat hasn't left, has it? (Quirk et al., 1985, p.810)

(2) Joan recognized you, didn't she? (Quirk et al., 1985, p.810)

The statement is referred to as anchor. Taking (1) as an example, the whole sentence "The boat hasn't left, has it?" is called tag question, the clause "The boat hasn't left" named anchor, and "has it" as tag.

Two main semantic functions were distinguished both in Chinese and English: Verification and Confirmation functions, the former one characterized by lower degree of assurance of the statement of tag question on the part of the speaker and the later one characterized by the higher degree of assurance of the statement of tag question on the part of the speaker.

For Chinese declarative tag questions, the polarity condition of tag only determines the semantic function of the tag question. Positive tags including positive-positive and negative-positive sentences generally express verification function with more shade of uncertainty on the part of the speaker whereas negative tags including positive-negative and negative-negative sentences generally express confirmation function with more shade of certainty on the part of the speaker. For English declarative tag question, the tone of tag generally determines the semantic function. On the one hand, rising tone on both positive-negative and negative-positive polarities represents real question with less assurance exercising verification function. On the other hand, falling tone is of more assurance exercising confirmation function. What's more, in Chinese classroom setting, English tag question is taught to have similar function as Chinese rhetorical questions, which is used primarily for searching confirmation. That is to say, to most of the Chinese EFL students, English tag question is believed to have a higher degree of assurance.

To sum up, positive tag of Chinese are more often than not used to search for answer while negative ones suggest higher degree of assurance using for gain confirmation in Chinese; whereas, there are no such form and function correspondences in English. For most of Chinese student, English tag question is considered to have a higher degree of assurance.

V. RESEARCH DESIGN

A. Objective

The purpose of this study is to detect possible effect of the L2 semantic knowledge on that of L1 by using Chinese tag question as example. We are trying to find out backward transfer from knowledge of English tag question to Chinese tag question at semantic function level.

B. Subjects

Two groups of candidates are distinguished according to a method purposed by Cook (2003) to establish the contrast between maximal bilinguals and minimal bilinguals. One group consists of 41 English major students of Nanjing Normal University (NNU), who have passed the highest English Test in China: Test for English Majors Band 8. The other group is composed of 60 students specialized in sports in NNU who failed to pass the lowest English Test for all University students in China: College English Test Band 4. They were chosen because they are not forced to learn English during their university time. Besides, they are similar to English major group in all other aspects except English learning experiences. The former group is referred to as English major group (EMG) and the later group as Non-English major group (NEMG).

C.   Instrument and Materials

A 5-scale assurance-doubt test containing 40 items was developed to reveal the participants' knowledge on semantic function of conduciveness of Chinese tag questions. Each item is made up of four utterances: the first and the third one is identical to all items serving as background setting and instruction, the second utterance is the target tag question of the item, and the last one is the proposition of the tag question. An example is listed below:

假如你的朋友小李对你说：   If your friend Li said to you:
他不想参加明天的聚会，是吗？ "He doesn't want to go to the party tomorrow, does he?"
请判断小李是否确定：   Please judge whether Li is sure about:
"他不想参加明天的聚会"   "He doesn't want to go to the party tomorrow."

Participants are asked to judge to what degree the speaker Li is sure about what he said from1 to 5 points. "1"= totally doubt, "2"= fairly doubt, "3"= half to half, "4"= fairly sure, and "5"= totally sure.

As to the target tag questions, we first distinguished two kinds of tag questions: natural one and controlled one. Natural tag question (NTQ) sentences are those can be found directly in corpus while controlled tag question (CTQ) sentences are made by the author in order to highlight the contrast of polarity of the sentence. We further distinguished four structures according to polarity for both NTQ and CTQ sentences: positive-positive, positive-negative, negative-positive, and negative-negative and each variant contain 5 items. Most of the target sentences come from online corpuses called CCL Chinese-English Bilingual Corpus (*http://ccl.pku.edu.cn:8080/ccl_corpus/*) and bebel Chinese-English Parallal Corpus (*http://www.icl.pku.edu.cn/icl_groups/parallel/concordance.asp*). The Chinese Corpus of the CCL Chinese-English Bilingual Corpus is available for the study with about 783 million tokens in all and nearly 582 million of them belong to modern Chinese and the bebel Corpus contains 709 pairs of sentences. Modifications are made to make sure that the selected sentences (1) best match the form of English tag question; (2) avoid any extra information which would influence the judgment, for example: model particles suggesting higher or lower certainty on the statement and factual or counter factual statement. Three Chinese teachers in a middle school are invited in the whole process of questionnaire preparing and provide valuable suggestions.

D.   Pilot Study

Before taking the experiment, a pilot study was conducted to give information about reliability of the questionnaire. 32 junior students in a middle school were selected to be subjects of the pilot study as they have not learn English tag questions at the time of taking the experiment. The inner reliability is tested by the index of Crobach's Alpha. For tag questions, the values of α of PP, PN, NP, and NN are above 0.9, PP=0.955, PN=0.902, NP=0.911, and NN=0.915 to be specific. The values of Cronbach's Alpha of controlled tag questions are 0.911, 0.881, 0.851, and 0.855 for PP, PN, NP, and NN respectively. The results show that the items are consistent with each other within the subtype.

VI.   RESULTS AND DISCUSSION

In order to find out the possible L2 effect, the data are put into SPSS 18.0 to make inter-group and intra-group comparison. The means of each structure are indicated in Table 1 in the first place.

TABLE 1:
MEANS OF EACH STRUCTURE FOR ENGLISH MAJOR GROUP AND NON-ENGLISH MAJOR GROUP

		English major		Non-English major	
		mean	SD	mean	SD
NTQ	Positive-positive	2.67	0.95	3.16	1.01
	Negative-positive	2.82	0.85	3.20	1.02
	Positive-negative	4.44	0.55	4.05	0.82
	Negative-negative	4.45	0.52	4.03	0.86
CTQ	Positive-positive	2.78	0.88	3.14	0.96
	Negative-positive	3.23	0.80	3.20	0.93
	Positive-negative	4.49	0.54	4.16	0.80
	Negative-negative	4.39	0.60	4.07	0.84

First of all, from Table 1, it is obvious that the means for positive tags are generally much lower than those for negative tags for both English major group and Non-English major group in both natural and controlled sentences regardless the polarity of the anchor. It is in accordance with the Chinese semantic rule that positive tags means relatively higher degree of uncertainty on the part of the speaker while negative tags means relatively lower degree of that. This result indicates that even there are slight influence of English semantic knowledge on Chinese, Chinese knowledge still plays a determine role in one's linguistic competence. This founding is no surprising, as L1 is expected to play a dominant role even for balanced bilinguals.

Then, to answer the question about the backward transfer from semantic knowledge of English tag question to Chinese tag question, we conducted paired sample test on positive tag structures and negative tag structures of both natural tag question and controlled tag question for Non-English major group and English major group separately. The results for Non-English major group are listed in Table 2 and results for English major group are listed in Table 3.

TABLE 2:
PAIRED SAMPLE TEST FOR NON-ENGLISH MAJOR GROUP

		Mean	t	df	Sig.
NTQ	PP-NP	-0.03	-0.85	59	0.398
	PN-NN	0.02	0.46	59	0.643
CTQ	PP-NP	-0.07	-1.15	59	0.086
	PN-NN	0.09	1.71	59	0.093

From Table 2, no significant differences are found between positive tag NTQ (t=-0.85, p=0.398) and negative tag NTQ (t=0.46, p=0.643). Similar to this, there are no significant differences between positive tag CTQ (t=-1.15, p=0.086) and negative tag CTQ (t=1.71, p=0.093). Above results suggest that positive-positive tag question and negative-positive tag question share same or at least similar meaning in terms of certainty in the view of Non-English major subjects. This proofs the view of many scholars statistically that positive tag in Chinese indicates higher level of uncertainty and negative tag indicates higher level of certainty. This founding serves as the baseline for results of English major group.

TABLE 3:
PAIRED SAMPLE TEST FOR ENGLISH MAJOR GROUP

		Mean	t	df	Sig.
NTQ	PP-NP	-0.16	-2.23	40	0.031
	PN-NN	-0.02	-0.34	40	0.738
CTQ	PP-NP	-0.45	-6.44	40	0.000
	PN-NN	0.11	1.50	40	0.139

From Table 3, we find significant differences between positive tag NTQ (t=-2.23, p=0.031) and positive tag NTQ (t=-6.44, p=0.000). By contrast, there are no significant differences between negative tag NTQ (t=-0.34, p=0.738) and negative tag CTQ (t=1.50, p=0.139).

The raise of the scores for negative-positive tag question compared to those of positive-positive tag question in natural and controlled structures demonstrates the raise of assurance of negative-positive tag question. This change is believed to be caused by the extension of English semantic knowledge to Chinese as the primary semantic function of English tag question is to ask for confirmation which indicates higher degree of assurance on the part of the speaker. There are two more evidence supporting the conclusion that the change is brought by backward transfer: (1) the raise in certainty does not occur in Non-English major group subjects who are equivalent to English major group subject in all other aspects but for English learning experience; (2) a sharp increase in certainty is found in controlled negative-positive tag question (Mean$_{PP-NP}$=-0.45, t=-6.44, p=0.000) but not in natural negative-positive tag question (Mean$_{PP-NP}$=-0.16, t=-2.23, p=0.031). As controlled tag question is designed to highlight the form-function mapping of the structure, the difference between NTQ and CTQ should be brought by the salient form: the polarity of the structure to be exact rather than other variables. So it is relatively safe to draw the conclusion that L2 knowledge has an effect on L1 at semantic level.

What's more, it is worth to pay attention to the experiment environment and features of subjects of current study. Unlike most of previous studies taking in L2 dominant linguistic environment with balanced L2 users, this study is carried out in L1 dominant environment with unbalanced L2 users. Although subjects of present study begin to learn English at around the critical period, they acquire English almost by formal instruction and have little contact with native English speakers much less the experience of living in English environment. The semantic extension from English to Chinese found here proved that exposure to L2 cultural environment is not indispensible to bring influence to L2 users' language system; intensive L2 learning in L1 dominant environment can lead to L2 effect on L1 as well.

In addition, the different results between positive tag structures comparison and negative tag structures comparison of English major group are worth concern. As mentioned above, the significant higher score found in negative-positive structure comparing to that of positive-positive structure is seen as the result of semantic extension from English to Chinese. However, no significant higher score is found in positive-negative structure comparing to negative-negative structure in both natural tag question (Mean$_{PN-NN}$=-0.02, t=-0.34, p=0.738) and controlled tag question (Mean$_{PN-NN}$= 0.11, t=1.50, p=0.139). The positive-negative tag question in English represents more often than not conduciveness of the speaker and the same is true in Chinese. This may imply that positive-negative tag question impress similar degree of assurance in English and Chinese, so no strengthen is found in the study.

Lastly, there is still an interesting phenomenon calls for explanation that the two groups scored differently in most of the structures. Independent sample test is done on all 8 structures between English major group and Non-English major group, showing in the following table.

TABLE 4:
INDEPENDENT SAMPLES TEST ON ENGLISH MAJOR GROUP AND NON-ENGLISH MAJOR GROUP

		Mean Difference (EG-NEG)	t	df	Sig.
NTQ	Positive-positive	-0.49	-3.10	99	0.002
	Negative-positive	-0.38	3.81	99	0.000
	Positive-negative	0.39	-2.34	99	0.019
	Negative-Negative	0.42	4.25	99	0.000
CTQ	Positive-positive	-0.36	-2.40	99	0.017
	Negative-positive	-0.01	3.42	99	0.001
	Positive-negative	0.33	-0.10	99	0.917
	Negative-Negative	0.32	3.81	99	0.000

From Table 4, we can find out that significant difference between English major and Non-English major group is detected in all tag question structures but for positive-negative one (t=-0.10, p=0.917). The difference between two groups of subjects on same polarity tag questions (PP and NN) is beyond our expectation. Since there is no same polarity tag question in formal English and, furthermore, Chinese EFL students has never learnt same polarity tag question, English major group subjects is expected to score the same or similar to Non-English major group subjects on those structures, whereas, significant differences are found in all four same polarity structures. To look closely into the scores of the four same polarity structures, we found that English major group subjects give much lower score to positive-positive tag question (NTQ: Mean$_{EG-NEG}$=-0.49, p=0.002; NTQ: Mean$_{EG-NEG}$=-0.36, p=0.017) and much higher score to negative-negaitve tag question (NTQ: Mean$_{EG-NEG}$=0.42, p=0.000; NTQ: Mean$_{EG-NEG}$=0.32, p=0.000) than Non-English group subjects. It seems that in structures free from possible direct influence of English form-function mapping, English major subjects tends to label lower level of assurance to positive tag structure and higher level of assurance to negative tag structure. The same tendency is found in all other structures except controlled negative-positive structure, which is caused by strong direct backward transfer discussed above. So compared to Non-English groups subjects, English major group subjects consider positive tag less conduciveness and negative tag more conduciveness. This implies that English major group subjects have a clearly form-function mapping awareness than Non-English major group subjects as they give more precise scores.

The ability to think and rethink the feature and function of languages forms is known as metalinguistic awareness (Gong, 2005). Form above results, we detected a more precise knowledge on semantic function of different Chinese tag questions on the part of English major group subjects compared to Non-English major group counterparts. This improvement in semantic awareness is regarded as the results bring by intensive English learning, especially in traditional Chinese English course where "focus on form" is prevalent.

Other researches did reported improvement of metalinguistic awareness as a result of SLA, however, their studies were taken out with children and the metalinguistic advantage is believed to disappear in adulthood (Bialystok et al., 2003; Gong, 2005). Current study, unlike most other studies, argues for metalinguistic advantage of adult L2 users. The author here tries to give tentative reason for this discovery: (1) Selection of subjects. As the target subjects of this study majored in English, they may outperform other student in general linguistic task and a clearer awareness on not only English but also Chinese just like a pianist outperform normal people in distinguish pitch made by a violin. (2) Use of 5-scale task. Unlike many other studies which asked their candidates to judge right and wrong of items in question, we applied a 5-scale task to distinguish minor differences. (3) Choose of tag question. The conduciveness of both Chinese and English tag question is modest rather than definitely sure or definitely uncertain which may help to avoid the ceiling effect and floor effect.

VII. CONCLUSION

This study showed the influence of English (L2) tag question knowledge on Chinese (L1) tag question conduciveness judgment. In other words, it proved the backward transfer from L2 to L1 at semantic level in L1 dominant environment. The L2 effect detected is subtle in natural condition. Although the effect is strengthened in controlled condition, L1 still plays a leading role. Besides, the data suggested improvement on metalinguistic awareness which remains to adulthood. We tentatively attribute this to target subjects choosing, applying of 5-scale task rather than true-false choices, as well as the use of tag question as example.

Despite from above findings, there are many limitations of this study. Firstly, there is only one task used in the study without enough supporting data from other tasks. Assurance-doubt task is used to prove English influence at semantic level; the data of it is convincing to some degree as a minimal bilingual control group is set. But still other tasks should be done to make sure that English influence is the source of change in question. Secondly, more effects should be taken to determine the source of semantic awareness improvement found in this study. More control groups should be set to determine whether the metalingustic advantage is limited to English major students or not. If the advantage can be found on other high proficiency English user in China, the adulthood advantage on metaligusitc awareness will be better proved.

APPENDIX

Target tag question sentences in assurance-doubt task (In Chinese)

	Natural Tag Question	Controlled Tag Question
PP	它与孩子们进行了交流，是吗？	昨天一起吃饭的那个人是学生，是吗？
	这医院还处在严密警戒中，是吗？	家里养的第一只宠物是小狗，是吗？
	朱先生去美国留过学，是吗？	小张一直想去的地方是西藏，是吗？
	你想马上就知道一切，是吗？	这首诗的作者是李白，是吗？
	他们管你叫老妈子，是吗？	那篇文章里提到的长河是黄河，是吗？
PN	这比拥有实力更有价值，不是吗？	日本的支柱产业是汽车产业，不是吗？
	那得视具体情况而定，不是吗？	那个季节最便宜的水果是苹果，不是吗？
	她可以用魔法得到想要的东西，不是吗？	张阿姨最喜欢的动物是兔子，不是吗？
	他有时候会说些搞笑的话，不是吗？	最后一个离开办公室的人是经理，不是吗？
	她算挺能进取的，不是吗？	当时人们最主要的食物是大米，不是吗？
NP	这不算敷衍，是吗？	去年生日收到的礼物不是汽车模型，是吗？
	你不满意你目前的生活，是吗？	咱们刚才看到的那个男生不是班长，是吗？
	他不会有麻烦的，是吗？	公司年会三等奖的奖品不是豆浆机，是吗？
	你不喜欢自己现在住的地方，是吗？	刚抓到的那个小偷不是惯犯，是吗？
	你不会忘记以前说过的话的，是吗？	第一个成为吉祥物的动物不是棕熊，是吗？
NN	在班里，她几乎是不引人注目的，不是吗？	这里最美的季节不是春季，不是吗？
	他不敢买这种报纸了，不是吗？	照片上穿裙子的女生不是你妹妹，不是吗？
	这永远都不会结束，不是吗？	故事中最受欢迎的人物不是公主，不是吗？
	她担忧的不该是他的头发，不是吗？	公司去年销量最高的化妆品不是口红，不是吗？
	你不能否认我说的话，不是吗？	受伤最严重的部位不是胳膊，不是吗？

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