Promoting Learner Awareness of Language Transfer Errors in ICALL[1]

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Abstract: *This paper discusses the motivation for embedding a component specializing in detecting language transfer errors in existing ICALL systems and provides a specification of how such a component can be implemented for ICALL systems whose target users are Chinese learners of English.*
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1. Introduction

In this paper, I discuss the motivations for embedding a component specializing in detecting language transfer errors in existing ICALL systems and provide a specification of how such a component can be implemented for ICALL systems whose target users are Chinese learners of English.

There are three different approaches to the analysis of "learner English" (Swan and Smith, 1987), namely, contrastive analysis, transfer analysis, and error analysis. As Okuma (2000) noted, these approaches differ in their standpoints. Contrastive analysis compares the structures of two language systems and predicts errors. Transfer analysis, on the other hand, compares "learner English" with L1 and attempts to explain the structure of those errors that can be traced to language transfer. Error analysis compares "learner English" with English (L2) itself and judges how learners are "ignorant" (James, 1998).

In terms of error diagnosis and feedback giving, most existing ICALL systems adopt the error analysis approach and do not handle cross-linguistic influence (Bull, 1995). However, users of ICALL systems can benefit from the transfer analysis approach in at least two important ways. First, transfer analysis can help the learner understand the source of language transfer errors and therefore may help them avoid these errors in the future. Second, it can also help the learner develop an awareness of language transfer errors, which is especially important because, as Selinker and Lakshmanan (1992) argued, language transfer may be linked to fossilization of erroneous usage.

The rest of the paper is organized as follows. Section 2 discusses the theoretical foundations of the proposal. Section 3 introduces some common lexical and syntactic transfer errors found among Chinese learners of English. Section 4 proposes a range of exercises that could be implemented in an ICALL component to help Chinese learners of English tackle common language transfer errors, and discusses what kind of feedbacks are appropriate and useful, especially for the purpose of awareness raising. Section 5 discusses what kind of natural language processing techniques could be used to detect language transfer errors in the user's answers to the proposed exercises.

2. Theoretical foundations

2.1 Interlanguage and language transfer

As defined in the *Random House Dictionary of the English Language* (1987), interlanguage is "the linguistic system characterizing the output of a non-native speaker at any stage prior to full acquisition of the target language", and language transfer is "the application of native language rules in attempted performance in a second language, in some cases resulting in deviations from target-language norms and in other cases facilitating second-language acquisition". According to the Interlanguage Hypothesis (see,

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e.g., Selinker, 1972; Selinker et al., 1975), learners create an interlanguage when they try to express meaning in a second language. Language transfer is the central element in the process of creating the interlanguage, because learners need to make use of available linguistic resources in creating the interlanguage, and these resources often come from their native language. Therefore, language transfer plays a very important role in second language acquisition.

Notice, however, language transfer is not restricted to L1 transfer. Odlin (1989) defined transfer as "the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfect) acquired." Bull (1995) discussed the importance to recognize the role played by other foreign languages in addition to the learner's native language. I will restrict my discussion to L1 transfer here, because in the case of Chinese learners of English, L1 transfer is primary: the majority of Chinese learners of English either do not know any other foreign language, or do not know one well enough for L3 transfer to be of significant interest.

2.2 Language transfer and fossilization

Fossilization refers to the phenomenon where a linguistic form, feature, rule, etc. becomes permanently established in the interlanguage of a second-language learner in a form that is deviant from the target language norm and that continues to appear in performance regardless of further exposure to the target language (*Random House Dictionary of the English Language*, 1987). A linguistic form may also be temporarily stabilized in the interlanguage instead of permanently fossilized, and stabilization needs to be distinguished from fossilization (Han and Selinker, 1999). Needless to say, however, both fossilization and stabilization of any false linguistic form, feature or rule are not desirable for second language learners.

The relationship between language transfer and fossilization is especially relevant to the motivation of this project. Selinker and Lakshmanan (1992), among others, proposed the multiple effects principle, which links language transfer and fossilization. Their basic idea is that when two or more source language factors work in tandem, there is a greater chance of stabilization of interlanguage forms leading to possible fossilization, and language transfer is a necessary co-factor in setting multiple effects. Once a structure is fossilized, it may not become open to destabilization through consciousness raising strategies when multiple effects apply.

Based on this theory, it is very important to help the learner understand the sources of language transfer errors and develop an awareness of such errors in the early stages of language learning, so that the stabilized linguistic forms in his or her interlanguage can be destabilized before they become fossilized.

3. Lexical and syntactic transfer errors of Chinese learners of English

In this section, I discuss some common lexical and syntactic transfer errors of Chinese learners of English. This discussion will facilitate the design of exercises to be included in the ICALL component that handles language transfer errors. The types of transfer errors covered here are not exhaustive. It is also important to keep in mind that this is not a discussion of all types of common errors, but only common transfer errors of Chinese learners of English.

3.1 Lexical transfer errors

Ro (1994) used lexical transfer to refer to the projection of the idiosyncratic properties of L1 lexical items onto the corresponding, i.e., translationally related target language lexical items. He argued that if the syntactic and semantic properties of an interlanguage lexical item diverge from the standard of the target language, but are strikingly similar to properties of the corresponding L1 lexical item, lexical transfer is a likely explanation. He considered two types of lexical transfer, i.e., transfer of L1 subcategorization frames and translational transfer of idiomatic expressions. These two types of lexical transfer are also prevalent among Chinese learners of English. I will illustrate these with some examples below.

3.1.1 Transfer of L1 subcategorization frames

Transfer of L1 subcategorization happens when a verb in Chinese and the corresponding verb in English have the same meaning but different subcategorization requirements, and the learner transfers the subcategorization requirement of the verb in Chinese to his or her interlanguage. This is illustrated in the following examples.

(1)   English expression intended: Welcome to China.
           English expression used: Welcome you to China.
           Corresponding Chinese expression: *Huanying ni dao zhongguo lai.*
           Literal translation in English: welcome you come China to

(2)   English expression intended: She will marry an engineer.
           English expression used: She will marry with an engineer.
           Corresponding Chinese translation: *Ta yao he yige gongchengshi jiehun.*
           Literal translation in English: he will with a-CL engineer marry

(3)   English expression intended: You should be able to find it.
           English expression used: You should can find it.
           Corresponding Chinese expression: *Ni yinggai neng zhaodao ta de.*
           Literal translation in English: you should can find it PAR

(4)   English expression intended: Yes, I like it very much.
           English expression used: Yes, I very like.
           Corresponding Chinese expression: *Shide, wo hen xihuan.*
           Literal translation in English: yes I very like

In (1), the Chinese verb *huanying* 'welcome' subcategorizes for a direct object, which may also serve as the subject of the following clause. In (2), the Chinese verb *jiehun* 'marry' subcategorizes for a preposed prepositional phrase. In (3), the Chinese modal verb *yinggai* 'should' subcategorizes for a verb phrase headed by another modal verb, *neng* 'can'. In (4), the object of the Chinese verb *xihuan* 'like' can be omitted. It seems reasonable to infer that in these cases the learner has transferred or partially transferred the subcategorization frames of these verbs in Chinese to his or her interlanguage, as the resemblance between the subcategorizations frames of these verbs in the interlanguage and those in Chinese are striking.

3.1.2 Translational transfer of idiomatic expressions

Examples of translational transfer of idiomatic expressions abound. I discuss some examples concerning verbs, adjectives, and nouns in turn below.

3.1.2.1 Verbs

In Chinese, *tang* 'soup' collocates with the verb *he* 'drink', and *dianshi* 'TV' collocates with the verb *dakai* 'open'. The following examples represent strong cases of translational transfer of these collocations in Chinese to the interlanguage.

(5)   English expression intended: have some soup
           English expression used: drink some soup
           Corresponding Chinese expression: *he yidian tang*
           Literal translation in English: drink some soup

(6)	English expression intended:	turn on the TV
	English expression used:	open the TV
	Corresponding Chinese expression:	*dakai dianshi*
	Literal translation in English:	open TV

3.1.2.2 Adjectives

The following examples illustrate translational transfer of Chinese adjective-noun collocations to the interlanguage. In Chinese, black tea is referred to as *hong cha*, which literally means red tea, and the latest news is referred to as *zuixin xiaoxi*, which literally means the newest news.

(7)	English expression intended:	black tea
	English expression used:	red tea
	Corresponding Chinese expression:	*hong cha*
	Literal translation in English:	red tea

(8)	English expression intended:	latest news
	English expression used:	newest news
	Corresponding Chinese expression:	*zuixin xiaoxi*
	Literal translation in English:	newest news

3.1.2.3 Nouns

The following examples illustrate translational transfer of Chinese nouns to the interlanguage. In Chinese, a teacher is usually referred to as *X laoshi* (teacher), where X is the teacher's surname. The Chinese noun *ke* can mean either class or lesson.

(9)	English expression intended:	Mr. Li or Professor Li
	English expression used:	Teacher Li
	Corresponding Chinese expression:	*Li laoshi*
	Literal translation in English:	Li teacher

(10)	English expression intended:	English class
	English expression used:	English lesson
	Corresponding Chinese expression:	*yingyu ke*
	Literal translation in English:	English class/lesson

3.2 Syntactic transfer errors

I discuss two types of syntactic transfer errors here, i.e., word order and subordination structure transfer.

3.2.1 Word order

In many cases, the learner may transfer the Chinese word order to the interlanguage, as illustrated in the following examples.

(11)	English expression intended:	I don't think he is smart.
	English expression used:	I think he is not smart.
	Corresponding Chinese expression:	*wo juede ta bu congming.*
	Literal translation in English:	I think he not smart

(12) English expression intended: Beijing is a really beautiful city.
      English expression used: Beijing really is a beautiful city.
      Corresponding Chinese expression: *Beijing zhen shi yizuo meili de chengshi.*
      Literal translation in English: Beijing really is a-CL beautiful DE city

(13) English expression intended: I had my hair cut at the barber's shop.
      English expression used: I cut my hair at the barber's shop.
      Corresponding Chinese expression: *Wo zai lifa dian li de fa.*
      Literal translation in English: I at cutting-hair shop cut DE hair

In Chinese, negation is more often realized in the subordinate clause than in the main clause in sentences such as (11). In (12), the Chinese adverb *zhen* 'really' is often placed before the verb *shi* 'be' to modify the entire verb phrase. In (13), *li* 'cut' and *fa* 'hair' usually appear in this order in Chinese.

3.2.2 Subordination

It is well-known among ESL teachers that Chinese learners have trouble with subordination structures such as *because... so* and *although... but*, as illustrated in the examples below. A good explanation for this could be that they tend to follow the coordination structure in Chinese, where 'because' and 'so' and 'although' and 'but' need to occur together within one sentence.

(14) English expression intended: Because he lost his wallet, he couldn't pay for it.
      English expression used: Because he lost his wallet, so he couldn't pay for it.
      Corresponding Chinese expression: *Yinwei ta diule qianbao, suoyi ta fubuliao qian.*
      Literal translation in English: because he lost wallet so he cannot-pay money

(15) English expression intended: Although he was sick, he still came to school.
      English expression used: Although he was sick, but he still came to school.
      Corresponding Chinese expression: *Suiran ta youbing, danshi ta haishi lai shangxue le.*
      Literal translation in English: although he sick but he still come school PAR

4. Exercises and feedbacks

In this section, I discuss several types of exercises that can be implemented in an ICALL component that handles language transfer errors. These include multiple choice, translation, and reading/listening comprehension exercises, with other types to be explored. For each type of exercises, I will also discuss what kinds of answers are required from the user, what kinds of errors are expected, and what kinds of feedbacks the system could give to the user. For the ease of the reader, I will use the examples (perhaps repetitively) above for my discussion here. Whereas recent ICALL systems emphasize the capability to process and give feedback to freely input sentences, I feel that controlled exercises that are likely to elicit transfer errors, when grouped together, may help raise the learner's awareness of such errors in a more effective way.

4.1 Multiple choice

Multiple choice is a common type of exercise that has been used extensively in traditional CALL systems, because it is relatively easy to implement. I discuss two subtypes of multiple choice exercises that could be useful for the ICALL component that handles transfer errors here.

The first subtype of multiple choice exercises is something like "Pick the Right Word". Like in other multiple choice exercises, the user is presented a sentence with a blank, and is asked to choose the best word to fill in the blank. The difference, however, lies in the focus of the exercises and the type of feedbacks to be provided based on the user's answers. The focus of this subtype of exercises will be on lexical transfer errors. The user is expected to pick the idiomatic word used in English, and the list of possible answers will contain, among others, one or two words that are directly transferred from Chinese.

If the user picks a transferred word, the system will remind the user that this is a direct translation of the corresponding Chinese word. If, in a set of such exercises, the number of transfer errors made by the user surpasses a preset threshold, the system will highlight the fact that the user is being heavily influenced by Chinese in the feedback, and suggest that s/he pay special attention to idiomatic English collocations systematically at the end of the exercises. Two examples of this subtype of multiple choice exercises are given below:

(16) Tom likes green tea, but Tim likes _____ tea.
    A. black
    B. red
    C. dark
    D. yellow

(17) Would you like to _____ some soup?
    A. take
    B. drink
    C. eat
    D. have

If the user picks B for (16) or (17), the system could return feedbacks similar to the following:

(18) "I guess you probably translated the Chinese word directly into English, but this is not idiomatic English."

If the user consistently makes similar lexical transfer errors, the system could return feedbacks similar to the following at the end of a section of exercises:

(19) "I sensed a heavy influence of Chinese in your English, as you are translating many Chinese words directly into English. You should be more careful with idiomatic English collocations."

The second subtype of multiple choice exercises is something like "Pick the Best English Sentence". This type of exercises will focus on word order transfer errors. The user will be presented a set of sentences with different word orders and will be asked to pick the most idiomatic one, as illustrated in the example below:

(20) Pick the best English sentence:
    A. Beijing really is a beautiful city.
    B. Beijing is really a beautiful city.
    C. Beijing is a really beautiful city.
    D. Beijing is a beautiful really city.

If the user picks A, the system could return the following feedback:

(21) "This is not the best way to say it in English. You are probably influenced by the Chinese word order."

Again, if the user consistently makes word order transfer errors, the system could return the following feedback at the end of the exercise:

(22) "I sensed a heavy influence of Chinese in your English, as you are transferring the Chinese word order to English in many cases. You should be aware that Chinese and English have different word orders and watch for such differences."

For both of these two subtypes of multiple choice exercises, if the user makes a non-transfer error, then the system could return feedbacks based on the error analysis approach. I do not discuss these cases here.

4.2 Translation exercises

With a carefully selected set of sentences, translation exercises can also be very useful in eliciting both lexical and syntactic transfer errors. The user will be presented a Chinese sentence, and will be asked to translate the sentence into English. An example of this is given as follows:

(23) Translate the following sentences into English.
    a. *Ni xihuan hong cha ma?*   (Do you like black tea?)
    b. *Shide, wo heng xihuan.*   (Yes, I like it very much..)

For (23a) and (23b), the user's answers might be "Do you like red tea?" and "Yes, I very like". If this happens, the system should return an alert of the transfer errors detected.

4.3 Reading or listening comprehension

It is also possible to include some reading and listening comprehension exercises. In this case, the user will first read or listen to a short conversation or paragraph, and will then be asked to answer some questions based on the conversation or paragraph. Like the translation exercises, these short answer exercises allow the user to freely input some sentences, but with the content of the sentences restricted. For example, the user may hear a short conversation in which Tom says to Mary that he doesn't think Peter is smart. The user can then be asked the following question:

(24) What does Tom think about Peter?

The user's answer might be "Tom thinks Peter is not smart". If this happens, the system could return the following feedback:

(25) "Looks like you are saying this in the Chinese word order. Listen to the conversation (or read the paragraph) again, and this time, pay special attention to how Tom says it."

5. NLP techniques to be used to give such feedback

In this section, I discuss the natural language techniques that are involved in order to enable the ICALL system to detect language transfer errors and provide useful feedbacks. These include both techniques that are useful for error analysis in general and those that are specifically useful for transfer analysis.

5.1 A database of translational transfer errors

A database of common translational transfer errors would prove useful for the ICALL component that handles language transfer errors. For one thing, this database can inform the design of exercises that focus on translational transfer errors. For another thing, the database could also facilitate the detection of translational transfer errors in freely input sentences, as will be discussed below. Entries of this database could be organized in the following format:

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(26)  latest    :  newest      :  news
      black     :  red         :  tea
      turn on   :  open        :  TV
      lesson    :  class
      Mr.       :  Teacher     :  LASTNAME
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In each entry, the first word is the intended English word in English, and the second word is the most likely word that is translationally transferred from Chinese. The third word is optional: if it is provided, it means the second word is translationally transferred from Chinese when it collocates with this word; if not, then the entry simply shows that the second word may be translationally transferred from Chinese for the first word in general. The compilation of such a database could benefit from three sources: study of learner corpora, experience of ESL teachers, and research in contrastive analysis.

5.2 Techniques useful for general error analysis
The following natural language processing tools are useful for error detection in a freely input sentence: a spell checker that corrects or asks the user to correct any misspelled words, a part-of-speech tagger that assigns a part-of-speech tag to each individual word, a chunker that groups words into phrases, and a parser that assigns a syntactic structure to the sentence. The parser could be based on a set of grammatical rules and constraints and determines whether a sentence is acceptable or unacceptable. The technique of constraint relaxation has been used in many ICALL systems to allow the parse to assign a syntactic structure to a sentence that violates one or more grammatical constraints, while keeping track of which constraints are being relaxed (see, e.g., L'haire and Faltin, 2003).

5.3 Additional subcategorization frames and syntactic rules
In order to detect transfer errors involving subcategorization frames, such as the ones in (1) through (4), the subcategorization frames of certain Chinese verbs can be added to the corresponding English verbs. To detect transfer errors involving word order and subordination structure, a set of syntactic rules can be added to the rules in the English grammar. These syntactic rules will be derived from rules of the Chinese grammar and will allow the parser to parse ungrammatical sentences such as the ones in (14) through (15). If the added subcategorization frames of a verb or one of the added syntactic rules is applied in order to parse a sentence, the system will return a corresponding message about the transfer error found.

5.4 Detecting translational transfer errors in freely input sentences
I have not discussed the technicalities involved in multiple choice exercises, because the feedbacks for each question there could be simply encoded manually. However, the detection of translational transfer errors is a much harder task. One possible and easy way to do this is to ask the exercise designer to code in the answer the key word that is involved in the translational transfer error the exercise is targeting. After parsing the sentence (and therefore detecting non-transfer errors, subcategorization frame transfer errors and syntactic transfer errors), the system could simply search the sentence to see if the key word occurs in it. The translational transfer error database can serve as a useful reference for coding the key word. For example, in addition to the expected answer to (20a), which would be "Do you like black tea?", the designer could code 'red' as the key word involved in the targeted translational transfer error. If the word 'red' appears in the answer, then it is likely that a translational transfer error is detected, and the system can give a corresponding error message about the transfer error.

6. Summary
On the theoretical side, drawing upon insights from second language acquisition, I have established the importance of including a component that handles language transfer errors in ICALL systems. On the practical side, I have discussed some common lexical and syntactic transfer errors found among Chinese learners of English, and proposed three types of exercises that could be used to elicit language transfer errors. I also discussed the natural language processing techniques involved in order to allow the system

to detect lexical transfer errors and give awareness-raising feedbacks. The discussion of lexical transfer errors also has implications on the importance of learning idiomatic collocations.

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