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Directionality and complexity of L1 transfer in L2 acquisition: Evidence from L2 Chinese discourse

https://doi.org/10.1515/iral-2017-0009

Abstract: First language (L1) transfer is a common phenomenon in second language (L2) acquisition. However, it will be argued in this article that although there are indeed pervasive influences of learners' L1 in L2 acquisition, L1 transfer is not everywhere and it can be directional. We compare data from Chang's (2001b. *Discourse effects on the second language acquisition of English and Chinese dative structures*. Honolulu: University of Hawai'i at Manoa PhD dissertation, 2004. Discourse effects on EFL learners' production of dative constructions. *Journal of Kaohsiung University of Applied Sciences* 33. 145–169.) studies of Chinese-speaking learners of English with data of our study of English-speaking learners of Chinese to examine whether their L2 English discourse and L2 Chinese discourse are equally influenced by their L1 discourse rules. We focus on learners' answers to *wh*-questions with a double object construction or a prepositional object construction. The results demonstrate that L1 transfer takes place in Chinese-speaking learners' L2 English discourse but not in English-speaking learners' L2 Chinese discourse. This directionality of L1 transfer is accounted for on the basis of computational complexity of linguistic structures involved and on an economical consideration.

Keywords: L1 transfer directionality, L2 English/Chinese discourse, answers to *wh*-questions

1 Introduction

First language (L1) transfer is widely recognised as a common phenomenon in second language (L2) acquisition and is also well documented in L2 acquisition literature (e. g. Gass and Selinker 1992; Schwartz and Sprouse 1994; Schwartz and Sprouse 1996; Sprouse 2006; Yuan 1994; Yuan 2007a; Yuan 2007b; Yuan 2010;

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among many others). L1 transfer is generally divided into positive transfer and negative transfer. In the former, L1 structures similar to or the same as those in the target language are transferred into learners' L2 grammars, which can facilitate the course of L2 acquisition; and in the latter, L1 structures which are different from the target language interfere with successful acquisition (Odlin 1989). While recognising pervasive influences of L1 in learners' L2 acquisition, an increasing number of L2 researchers have found evidence that L1 transfer is not inevitable and that it can be relative in L2 acquisition. For example, Yuan (2001) conducted an investigation of the status of thematic verbs in L2 acquisition of Chinese by French-, German- and English-speaking learners, and argues that L1 transfer is a relative phenomenon in L2 acquisition rather than an absolute phenomenon and that a task which L2 researchers are faced with is to find out when and why L1 transfer does or does not take place. In a study involving an oral narration task and an acceptability judgment task, Montrul (2010) examined knowledge of Spanish clitics, clitic left dislocations and different object marking in proficiency-matched adult English-speaking learners of L2 Spanish and Spanish heritage speakers, and found little L1 transfer in the syntactic clitic placement in either L2 Spanish learners or Spanish heritage speakers. In this article, we will use data of double object construction (DOC) and prepositional object construction (POC) from Mandarin Chinese (hereafter, Chinese) speakers' L2 English and English speakers' L2 Chinese to argue that there is directionality of L1 transfer in L2 acquisition and that this directionality is determined by degrees of complexity of linguistic structures in the target language in comparison with those in learners' L1.

2 Double object and prepositional object constructions in English and Chinese

In both English and Chinese, ditransitive verbs can take an indirect object (IO) followed by a direct object in the DOC, which can alternate with a POC with synonymous meaning. This phenomenon is known as the dative alternation, as in (1) and (2).

(1) a. *I give Mary a present.* [DOC]
b. *I give a present to Mary.* [POC]

(2) a. *wo song Mali yi-fen liwu.* [DOC]
I give-as-a-gift Mary one-CL present
'I give Mary a present.'

b. *wo song yi-fen liwu gei Mali.* [POC]
I give-as-a-gift one-CL present to Mary
'I give Mary a present.'

On the representation of ditransitivity, English and Chinese exhibit strikingly similar properties. First, the syntactic structures of their DOCs are identical, consisting of an external argument (the subject), and two contiguous internal arguments (the IO and the direct object) in strict word order, as in (3).

(3) $[NP_{Subject}\ V\ NP_{Indirect\ Object}\ NP_{Direct\ Object}]$

English DOC is defined as a $[_{VP}\ V\ NP\ NP]$ structure in which the IO asymmetrically c-commands the direct object (Barss and Lasnik 1986; Larson 1988; Larson 1990). Similarly, Chinese DOC also observes the asymmetrical c-command hierarchy (Aoun and Li 1989; Li 1990), viz. its IO must also asymmetrically c-command the direct object. Resembling English sentences like (1b), Chinese sentences like (2b) possess the POC with the *to*-prepositional object (PO) frame as in (4).

(4) $[NP_{Subject}\ V\ NP_{Direct\ Object}\ to\text{-}NP_{Indirect\ Object}]$

Semantically, it denotes an event of transfer of an entity from an {Agent/Actor/Causer} to a {Goal/Recipient} via a path (cf. Green 1974; Gropen et al. 1989; Harley 2002; Oehrle 1976; Pinker 1989; Richards 2001; among others). The direct object plays the semantic role of theme whereas the PO has the thematic role of goal or recipient. Examples of these alternating structures in Chinese are given in (5) with the corresponding English translations.[1]

(5) a. *Mali song-le Yuehan yi-ben shu.* [V NP NP]
Mary give-as-a-gift-PFA John one-CL book
'Mary gave John a book as a gift.' [V NP NP]
b. *Mali song-le yi-ben shu gei Yuehan.* [V NP *gei* NP]
Mary give-as-a-gift-PFA one-CL book to John
'Mary gave a book to John as a gift.' [V NP *to* NP]

1 Some researchers regard *gei* in (5b) as a serial verb (Hsueh 1983; Huang and Mo 1992; Huang and Ahrens 1999; Li 1985; Li 1990), but others believe that it is a preposition (Ernst 1986; Ernst 1987; Ernst 1988; Zhang 1990; Her 2006). In this article, we adopt the notion that *gei* in (5b) is a goal-marking preposition. Hence, the Goal POC in Chinese, as in (5b), is comparable to the POC [V NP *to* NP] in English.

The relation between these two frames of structures in (5a) and (5b) is frequently referred to as the "dative alternation", "dative shift" or "dative movement" in linguistic literature.

3 Information structure and echoicity

In literature on linguistics, it is widely documented that the selection of a specific ditransitive structure in a certain circumstance is usually discourse oriented (Arnold et al. 2000; Bock and Warren 1985; Bresnan et al. 2007; Davidse 1996; Erteschik-Shir 1979; Givón 1984a; Givón 1984b; Snyder 2003; Wasow 1997a; Wasow 1997b; Wasow 2002; inter alia). In this study, we will look at two particular interacting discourse principles which have been proposed to explain why interlocutors choose the DOC instead of the POC or vice versa. One concerns information structure and the other relates to repetition or echoicity. The principle of information structure underlines the Given-New (G-N) word order signifying that given information precedes new information in a sentence. Conversely, echoicity assumes that it is more likely for a hearer in a dialogue to repeat information and reiterate the syntactic form appeared in previous contexts than to use another syntactic form, even though the latter is just as apposite (Bock 1986).

Information structure[2] here refers to the way in which speakers interconnect *given* (G) and *new* (N) information during a discourse (Chafe 1987; Chafe 1992; Chafe 1993; Chafe 1994; Givón 1984a; Givón 1989; Halliday 1985; Haviland and Clark 1974; Lambrecht 1987; Prince 1981; inter alia). In this article, we assume that given/old information[3] is clearly conveyed by the speaker and readily available to the hearer in prior discourse context, whereas new information is defined as knowledge held

2 Originating from Halliday (1967), the term 'information structure' has been broadly employed to refer to the division of language structures into different theoretical taxonomies such as topic, comment, presupposition, focus, givenness, newness, etc. As yet, no consensus in modern linguistics has been reached on what and how many types of information structure should be differentiated, and how these can be categorised.

3 Prince's (1981) taxonomy of givenness includes the following 3 main categories:

(A) Givenness$_p$ (Predictability): The speaker assumes that the hearer CAN PREDICT OR COULD HAVE PREDICTED that a PARTICULAR LINGUISTIC ITEM will or would occur in a particular position WITHIN A SENTENCE. (Prince 1981: 226)

(B) Givenness$_s$ (Saliency): The speaker assumes that the hearer has or could appropriately have some particular thing/entity/... in his/her CONSCIOUSNESS at the time of hearing the utterance. (Prince 1981: 228)

(C) Givenness$_k$ (Shared Knowledge): The speaker assumes that the hearer '*knows*', assumes, or can infer a particular thing (but is not necessarily thinking about it). (Prince 1981: 230)

Please see Prince (1981) for full exposition.

by the speaker, which has not been mentioned and is unknown to the hearer. Furthermore, for the purpose of this article, the notion of givenness is confined only to the domain of simple *wh*-questions and answers with respect to the dative alternation. Drawing on Erteschik-Shir's (2007) identification, the referent of the NP already established in a *wh*-question is the given information of the answer, whereas the referent of the NP that responds to but is absent in the *wh*-question is the new information, as illustrated in (6).

(6) Q: *What did Matthew give to Katie?*
A: *Matthew gave Katie a book.*
↓ ↓
Given New

It is widely recognised that the G-N information flow is a universal discourse phenomenon (Brown and Yule 1983; Clark and Clark 1978; Bock and Irwin 1980; Halliday 1985; Haviland and Clark 1974; Kaiser and Trueswell 2004; Ferreira and Yoshita 2003; Choi 2008; Choi 2009; Marefat 2005; inter alia). By manoeuvring givenness and newness in English, DOCs and POCs are used to answer prior *wh*-questions which determine given information (Bock 1977; Bock and Irwin 1980; Chomsky 1971; Van Dijk 1977). Consider dialogues in (7) and (8), which are supposed to be delivered with normal, unstressed intonation by speakers (Chomsky and Halle 1968).

(7) *To whom did Mary give a book?*
a. *Mary gave a book to John.* POC
↓ ↓
Given New
b. ?*Mary gave John a book.* DOC
↓ ↓
New Given

(8) *What did Mary give to John?*
a. *Mary gave John a book.* DOC
↓ ↓
Given New
b. ?*Mary gave a book to John.* POC
↓ ↓
New Given

The prior *wh*-question in (7) establishes the proposition that *Mary gave a book to someone* as given information, and asks for a recipient as new information. The elicited POC response as illustrated in (7a) is felicitous since the PO form organises the new information *John* to be situated at the sentence-final position, in conformity with the G-N discourse order. By contrast, the DOC response in (7b) sounds unnatural because the transferred object, *a book*, which denotes given information, occurs in the sentence-final position. This order does not comply with the G-N principle. Likewise, the *wh*-question in (8) changes the constituent order of givenness and newness. Setting up the proposition that *Mary gave John something* as given information, the question solicits the unknown information about the theme *a book*. As a result, it deduces a felicitous DOC in (8a) where the given information, the recipient *John*, is presented before the new information, the theme *a book*. This arrangement conforms to the G-N discourse condition. By contrast, the POC response in (8b) is inappropriate because the information flow does not satisfy the requirements of the G-N constraint. Hence, by means of the preceding *wh*-question and the immediately following response, what is given information is duly established and the selection of information structures is obviously revealed in the answer.

Repetition, also termed echoicity,[4] is also a predominant and ubiquitous phenomenon in discourse (Brody 1986; Brody 1994; Brody 2003; Pickering and Ferreira 2008; Tannen 1987; Tannen 1989; Tannen 2007). Widely documented in extensive literature on linguistics as well as psycholinguistics, repetition refers to the tendency in which an interlocutor echoes or repeats the information or syntactic pattern of a preceding context (Bock 1986; Costa et al. 2008; Ferreira and Bock 2006; Johnstone et al. 1994; Levelt and Kelter 1982; Pickering and Ferreira 2008; Pickering and Branigan 1999; Schenkein 1980; Weiner and Labov 1983; among others). For example, interlocutors are inclined to depict a picture with a double object (DO) pattern such as *The man is reading the boy a story* after producing or hearing a prior DO sentence such as *The foundation is giving the university several million dollars* (Bock 1986; Branigan et al. 2000a; Branigan et al. 2000b). Conversely, speakers are apt to use a PO form such as *The man is reading a story to the boy* to describe a subsequent picture after producing or hearing a PO structure such as *The foundation is giving several million dollars to*

4 Some have employed the term *structural priming* (e. g. Pickering and Ferreira 2008), *syntactic priming* (e. g. Pickering and Branigan 1999) or *syntactic persistence* (e. g. Bock 1986) rather than *repetition* to refer to the tendency for interlocutors to repeat the pattern of utterances that they have recently heard, produced or comprehended. As we only look at simple *wh*-questions and answers in interactive discourse context where the selection of syntactic patterns is motivated by discourse, the term *repetition* is used interchangeably with *echoicity* in this article.

the university. Repetition is evident in the production and comprehension of various types of syntactic structures in both experimental and naturalistic settings (Bock et al. 2007; Branigan et al. 2000a; 2000b; Potter and Lombardi 1998; Weiner and Labov 1983).

Why do speakers tend to repeat old information during the interaction of a speech? Broadly speaking, echoicity in conversational interaction intensifies the cohesive and coherent quality of a discourse and connects conversational components more solidly together. Reiterating materials from the previous speech of one's interlocutor makes the conversation topic easy to follow, thus enhancing communication interaction during the discourse (Tannen 1989; Tannen 2007; Bennett-Kastor 1994). As a result, repetition economises the resource for production and comprehension (Tannen 1989; Tannen 2007), and serves as a tactic to express the attitude and emotion of the interlocutors. Repetition arises from implicit learning where semantic features are mapped onto syntactic constructions (Bock and Griffin 2000; Chang et al. 2000). Structural repetition can bring about long-lasting modifications to an interlocutor's linguistic performance (Bock and Griffin 2000). These enduring effects may demonstrate the interlocutor's sensitivity to the linguistic domain learnt (Ferreira 2003; Hartsuiker and Westenberg 2000), reflecting the speaker's current state of knowledge. Thus, broadly speaking, repetition can be considered as a form of implicit learning, a mechanism by which interlocutors link up and reinforce their knowledge of specific syntactic configurations in the grammar of a language. Such reinforcement signals the gradual acquisition of a particular language. Putting altogether results of the above-mentioned studies, it comes as no surprise that language users or speakers repeat. Repetition facilitates language acquisition as well as effective communication. Repetition is "not just facilitating particular processes" but also "tapping into linguistic knowledge itself" (Branigan et al. 1995: 489).

It has been shown in the literature that native Chinese speakers tend to adopt the echoicity strategy in answering *wh*-questions in Chinese. In Chang (2001a; 2001b), it is found that instead of following the G-N order, native Chinese speakers echoed the patterns of preceding questions in their answers to *wh*-questions in Chinese. That is, when a question was presented in the DOC form, a DOC was produced in the response; likewise for a POC, which reveals a strong propensity to repeat the form of a prior question in Chinese. Chang (2001a; 2001b) argues that echoicity is a powerful factor that influences Chinese speakers' selection of the dative variants. This is also supported by data in Huang (2009), where it is found that echoicity is a determining factor in dative word order variation chosen by native Chinese speakers. Chinese is generally considered as a *wh*-in-situ language whilst English a *wh*-movement one; hence, the likelihood for selecting a particular alternating structure in terms of simple *wh*-questions does not appear to be entirely

similar. This phenomenon is mainly due to the idiosyncratic properties of the *wh* word syntax between the two languages. Chinese *wh*-elements are not subject to movement but remain in their base-generated positions, which can be in the middle or the final position of a structure, as in (9).

(9) a. *Yuehan song-le shui yi-ben shu?*
John give-as-a-gift-PFA who one-CL book
'To whom did John give a book?'
b. *Yuehan song-le yi-ben shu gei shui?*
John give-as-a-gift-PFA one-CL book to who
'To whom did John give a book?'

By contrast, English *wh*-words in simple *wh*-questions do not stay in their underlying locations but have to move to the sentence-initial position, as in (10).

(10) a. *Who$_i$ [did John give a book to t$_i$]?*
b. *What$_i$ [did John give t$_i$ to Mary]?*

Comparing the dative syntax between the two languages, obviously, Chinese dative question forms particularly facilitate echoicity in the answers. Since the *wh* element remains in its base-generated position, what a respondent has to do is just put the answer in the original location of the *wh*-word. The dative question itself has already established a structural frame for the interlocutor to adhere to, as illustrated in (11) and (12).

(11) Q: *Mali song-le shui yi-ben shu?*
↓
Recipient
↓
New
Mary give-as-a-gift-PFA who one-CL book
'To whom did Mary give a book?'
A: *Mali song-le Yuehan yi-ben shu.* DOC
↓ ↓
Recipient Theme Echoicity: [New-Given]
↓ ↓
New Given
Mary give-as-a-gift-PFA John one-CL book
'Mary gave John a book.' (inappropriate in English)

(12) Q: *Mali song-le shenme gei Yuehan?*

↓

Theme

↓

New

Mary give-as-a-gift-PFA what to John

'What did Mary give to John?'

A: *Mali song-le yi-ben shu gei Yuehan.* POC

↓ ↓

Theme Recipient Echoicity: [New-Given]

↓ ↓

New Given

Mary give-as-a-gift-PFA one-CL book to John

'Mary gave a book to John.' (inappropriate in English)

As we can see from the dialogues in Chinese above, the interlocutor can readily echo the question syntax in response. In replying to the DO *wh*-question in (11), the respondent can simply repeat the word order in the question by placing the new information, the recipient *Yuehan* 'John', before the given information, and the theme, *yi-ben shu* 'a book', at the end of the sentence, thus yielding a DOC. Equally, when a hearer answers the PO *wh*-question in (12), s/he can just echo the word order of the question by placing the new information, the theme *yi-ben shu* 'a book', before the given information, and the recipient *Yuehan* 'John', at the end of the sentence, thus generating a POC.

4 The G-N order and echoicity in L2 dative alternation

It has been shown that echoicity is more promptly available in a *wh*-in-situ language like Chinese than a *wh*-fronting one like English. It may be because the surface word order of a simple *wh*-question of the latter cannot exactly correspond with the face order of the answer. In other words, English speakers cannot simply put the answer in the same sentence-initial position where the *wh*-word appears in the English *wh*-question. Owing to this syntactic characteristic, native English speakers are likely to use a non-echoing processing principle, i. e. the G-N discourse rule, in handling English dative *wh*-questions.

Given the analysis above, an interesting question arises; how will Chinese-speaking learners of L2 English handle answers to English dative *wh*-questions and vice versa for English-speaking learners of L2 Chinese? According to a "Full Transfer" model proposed by Schwartz and Sprouse (Schwartz 1998; Schwartz and Sprouse 1994; Schwartz and Sprouse 1996), the end state of L1 acquisition is the initial state of the L2 acquisition, and the L1 grammar is transferred to the L2 initial state in its entirety. If discourse rules are included in what is transferred from learners' L1 to their L2, we can hypothesise that Chinese-speaking learners of English would be influenced by their L1 echoicity strategy in handling their L2 English dative *wh*-questions. This is confirmed in studies by Chang (2001a; 2001b; 2004).

Chang (2001b) conducted a study of responses to English POC questions by Chinese-speaking learners of English as a second language (ESL). Participants in the study included 36 Chinese-speaking L2 English learners at advanced levels of English, who had high TOEFL scores and had an average stay in an English-speaking country for 5.6 years. There were also 30 native English speakers serving as a control group in the study. The purpose was to examine whether in answering English POC questions, Chinese ESL learners would follow the G-N principle or adopt their L1 echoicity instead.

All participants had to provide an answer orally with a complete sentence on the basis of a picture cue after they heard a question. Examples of the questions are given in (13a) and (14a) and potential answers in (13b), (14b) and (14c). It was hypothesised that while native English speakers would respond following the G-N principle, independent of the form of the question, as shown in (14b), Chinese ESL learners would be guided by the tendency in their L1 Chinese to echo the structure of the question, as in (14c), which does not sound natural in a neutral context in English.

(13) a. Q: *Who did John give a book to?*
b. A: *John gave a book to Mary.*
Given New

(14) a. Q: *What did John give to Mary?*
b. A: *John gave Mary a book.*
Given New
c. A: *?John gave a book to Mary.*
New Given

The results of Chang's (2001b) study show that 92% of native English speakers' and 94% of ESL learners' answers to questions like (13a) are in the form of (13b), where the given information precedes the new information. However, with the data like this, it is impossible to determine whether ESL learners' answers like (13b) are guided by the G-N principle or by the echoicity transferred from their L1 Chinese into their L2 English, because their answers to questions like (13a) can be explained by either of these two accounts. That is, in both the G-N order and the echoic pattern, the given information *a book* precedes the new information *Mary*. In answering questions like (14a), 62% of native English speakers'[5] and 47% of ESL learners' answers did not echo the form of the question, and instead, the answers were structured in conformity with the G-N principle. However, more than half, i. e. 53%, of ESL learners' answers to questions like (14a) are in the form of echoicity, which can be interpreted as a result of L1 transfer. It is clear that the evidence of L1 transfer is not robust because 47% of ESL learners' answers to questions like (14a) did indeed follow the G-N principle. This is argued by Chang (2001b) to be due to the ESL learners' advanced English language proficiency and to their long stay in English-speaking environments. This implies that clearer evidence of L1 transfer in echoicity should be found in Chinese ESL learners at lower proficiency levels.

This is indeed confirmed by data from 146 intermediate ESL learners in Chang (2004). In this study, three intermediate groups of Chinese speaking ESL learners were involved, i. e. 79 high-intermediate learners, 35 mid-intermediate learners and 32 low-intermediate learners.[6] The same test materials as (13a) and (14a) above were used. However, instead of asking participants to answer the question orally after hearing the question, as in Chang (2001b), questions in Chang (2004) were printed out and participants were asked to provide their answers in writing on the basis of picture cues. The reason for changing the test from listening-speaking to reading-writing, as Chang explained, was due to the lower English language proficiency of these three groups of ESL learners because it would have been difficult to elicit answers of complete sentences that the test was designed for if a listening-speaking mode had been adopted with these groups of lower English language

5 Here the native English speakers did not strictly follow the G-N order as 38% of their answers to questions like (14a) were in the form of echoicity. Chang (2001b) speculates that this may be due to the fact that native English speakers use stress as a device to differentiate the information flow. For example, to answer a question like (14a), an answer with a stress on the new information *a book*, as in *John gave **a book** to Mary*, is acceptable. Of course, we cannot rule out the possibility that this prosodic strategy is also adopted by advanced ESL learners.

6 The high-intermediate group included 2nd-year English majors, the mid-intermediate group 1st-year English majors and the low-intermediate group non-English majors.

proficiency. The results show that in answering questions like (13a), 97 % of answers by the low-intermediate group, 97 % by the mid-intermediate group and 90 % of high-intermediate group adopted the form of (13b), which is in conformity with both the G-N principle and the echoicity. What is interesting is that in answering questions like (14a), 93 % of the answers by the low-intermediate group, 96 % by the mid-intermediate group and 88 % by the high-intermediate group were in the form of (14c), which violates the G-N principle but follows the pattern of echoicity in the ESL learners' L1 Chinese.

Findings in Chang (2001b; 2004) are summarised in Figures 1 and 2. As we can see from Figure 1, Chinese speaking ESL learners have native-like performance in answering questions like (13a), where they adopt the G-N principle by constructing their answers with the given information preceding the new information. However,

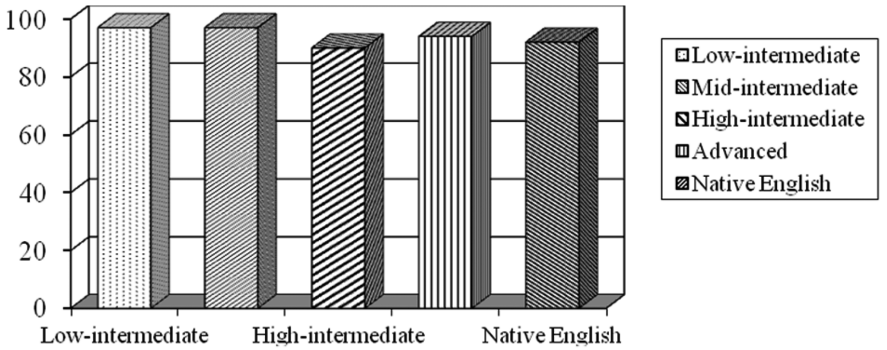


Figure 1: Percentage of each group's answers which follow both the G-N principle and echoicity, i. e. in the form of (13b).

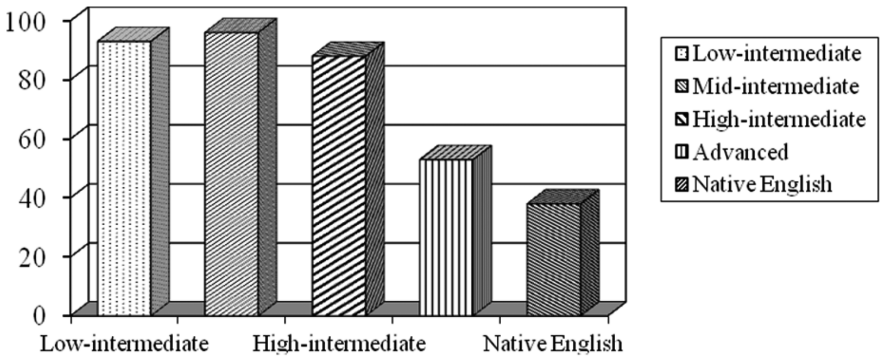


Figure 2: Percentage of each group's answers which violate the G-N principle but follow echoicity, i. e. in the form of (14c).

the ESL learners' answers can also be accounted for by echoicity as the questions are given in the form of POC and the answers provided are also in POC. Therefore, it is likely that ESL learners simply echo the POC structure in their answers, which can count as evidence of L1 transfer of Chinese echoicity.

With data related to answers like (13b), we are unable to determine what is the underlying system which guides Chinese ESL learners in their use of DOC and POC, nor can we be sure whether there can be any change in their L2 English from the L1-based echoicity to the G-N information order in the target language. However, Figure 2, i. e. data concerning answers like (14c), can be of great use. As we can see in Figure 2, Chinese ESL learners at intermediate levels persistently use the POC structure to answer POC questions like (14a) in spite of the fact that POC answers to the questions violate the G-N principle. This provides us with evidence of transfer of echoicity from ESL learners' L1 Chinese to their L2 English, and it also demonstrates that the effect of this L1 transfer is so persistent that it is evident throughout all the intermediate stages (and probably also earlier stages).

From the data in Figure 2, we can see that native English speakers do not strictly follow the G-N order although there is such a tendency; 38 % of their answers to questions like (14a) are in the form of echoicity. Chang (2001b) speculates that native English speakers may be aware of stress as a device to differentiate the information flow. For example, to answer a question like (14a), an answer with a stress on the new information *a book*, as in *John gave* ***a book*** *to Mary*, is acceptable in English, which can account for their occasional (i. e. 38 %) use of POC in answering questions like (14a). If this explanation is on the right track, we can also use it to account for advanced ESL learners' optional use of POC to answer questions like (14a). Recall that Chinese-speaking ESL learners in Chang (2001b) were very advanced with an average stay in English-speaking environments for 5.6 years. With exposure to the target language for such a long period, it is not unlikely that advanced ESL learners become sensitive to the G-N principle and become aware of the stress device in handling information flow in their L2 English. Of course, this needs further investigation, but what the data in Chang (2001b, 2004) have clearly indicated is that echoicity is transferred into Chinese ESL learners' L2 English and that its effect can be rather persistent.

If echoicity can be transferred from ESL learners' L1 Chinese into their L2 English, is it possible that the reverse can also take place in English-speaking Chinese second language (CSL) learners' L2 Chinese? That is, we ask whether English-speaking CSL learners would, at least at early and intermediate stages, transfer the G-N principle from their L1 English to their L2 Chinese, without following the echoicity device used in the target language Chinese.

5 Empirical study

5.1 Participants

The empirical study involved 161 participants. Apart from a cloze test adopted from Yuan (1995; 1999), three different web-based tests were designed: an Acceptability Judgment Test, a Preference Ranking Test and a Picture-Sentence Matching Test. The study reported in this article only involves data from the Preference Ranking Test (PRT).

One hundred and twenty-one adult native English-speaking learners of L2 Chinese participated in the experiment and 40 native Chinese (CN) speakers served as a control group.[7] English-speaking CSL learners were recruited in different parts of the world (see Appendix A for information about the distribution and percentage of the CSL learners by locations). All were post-pubescent L2 learners of Chinese with no Chinese parentage. The majority of them were selected from a number of universities and tertiary institutes in different countries including UK, USA, Canada, Australia and China. Whilst they had been exposed to classroom instructions in non-Chinese settings, they also had various degrees of naturalistic interactions with native Chinese speakers. The majority had visited China for varying durations (see Appendix B for information about distribution of the CSL learners from each institution and the percentage of those who had been to a Chinese-speaking area).[8]

The native Chinese controls were teachers and office administrators living mostly in Beijing although a small number were residing in various cities in

7 Originally, 141 and 63 questionnaires were returned respectively by English-speaking CSL learners and native speakers of Chinese. Amongst these, 20 and 23 questionnaires respectively were removed from analysis on the grounds that a) the scores of their Chinese proficiency tests were below 7 and 35 respectively (total = 40); b) the returned questionnaire was incomplete; c) the participant constantly chose the same answer or 'I don't know' for all test items; and/or d) the learner was a heritage speaker of Mandarin Chinese or bilingual from birth, e. g. English/Mandarin Chinese, or English/German, English/French, etc.

8 In addition to undergraduate and postgraduate students, native English speakers known through personal networks to be highly proficient in Chinese were invited to participate in order to achieve a more sizeable sample, in particular at the advanced or very advanced levels. This bespoke group included professionals engaged in different Chinese-connected works: viz. executives and office staff in the commercial or financial sectors; librarians, professors and lecturers in the academic sector; officials in the diplomatic service and religious preachers. Demanded by their careers, they either were presently residing in China or had extensive and regular exposure to Chinese and frequent interactions with native Mandarin speakers in a Chinese-speaking environment.

Mainland China. All Chinese participants were monolingual Mandarin speakers. The majority of them did not have knowledge of English except for a few whose English was at a very elementary level.

The CSL learners were divided into four proficiency groups, based mainly on their scores in a cloze test (Yuan 1995; Yuan 1999)[9]: Post-beginner (PB) Group (with scores between 7 and 18),[10] Intermediate (INT) Group (scores above 18 below 30), Advanced (AD) Group (scores between 30 and 32), and Very Advanced (VA) Group (scores equal to or exceeded 33).[11] For comparing group performances in the cloze test, the F test of a one-way ANOVA was computed with Group as the independent variable and Mean Proficiency Score as the dependent variable. There was a significant main effect of Group ($F_{(4,\ 156)} = 384.64$, $p < 0.001$). Subsequent pair-wise Tukey tests for independent samples on the mean proficiency scores reveal statistically significant differences between the performances of each pair of groups but not between the VA and CN groups ($p = 0.0564$). These results signify that learner groups had dissimilar levels of competence in Chinese. Moreover, the absence of a statistically significant difference between the VA and CN Groups suggests that the most advanced learners, the VA Group, had attained native-like competence in Chinese. In view of these results, it can be concluded that the performance of each learner group reflects distinct stages in the development of L2 Chinese. Table 1 provides information on each group.

5.2 Instruments and procedures

The experiment was conducted via the internet. There was no time constraint on the test so as to diminish undesirable performance factors such as test anxiety and nervousness, especially for the post-beginners. In fact, participants were

9 The cloze test consists of two passages in Chinese characters, with 40 blanks (i. e. the full score is 40). An exact-character marking criterion was adopted in marking the cloze test. Although it is not an officially standardized test, the cloze test has been used in a number of L2 Chinese studies (Yuan 1995, 1999, 2007a,b, 2010, 2015, among many others) and has proved to be a practical and reliable testing instrument with a strong discrimination power for Chinese language proficiency.

10 The rationale for not having a Beginner Group is that Chinese ditransitive constructions, in particular the dative alternation, are relatively complicated structures; beginners are not expected to have acquired any such knowledge at this very initial stage.

11 Additionally, the VA participants had to meet the following condition: they either (a) were presently residing in China or Taiwan or (b) had stayed there for at least 18 months and were using Chinese extensively in their daily life ever since.

Table 1: Information of each group.

Group	No. of subjects (Total = 161)	Mean age (years)	Age range (years)	Average number of months learning Chinese[(a)]	Average number of months in China/ Taiwan	Chinese proficiency test (Total full score = 40)		
						Mean	Range	SD
Post-beginner (PB)	22	25.95	18–74	38.65	3.53	13.59☆✦◈	7–18	3.63
Intermediate (INT)	48	28.46	18–73	60.95	11.38	24.75☆ ◘⌘	19–29	3.49
Advanced (AD)	29	26.90	20–65	74.21	13.80	30.93✦ ◘ ▼	30–32	0.84
Very Advanced (VA)	22	29.36	20–51	132.69	36.73	36.05 ◈ ⌘▼	33–39	1.99
Chinese Native (CN)	40	30.25	17–62	N/A	N/A	37.93	35–40	1.67

Key: (a) This includes classroom and naturalistic learning
SD = standard deviation
= significantly different from the Chinese Native group
☆✦◈◘⌘▼ = significantly different between the two groups.

allowed to have a short break during the test to refresh themselves. Typically, the completion time of the CSL learners for the whole questionnaire varied from 60 to 120 minutes, whereas that of the CN was around 45 minutes.

Invited participants were asked to log on to the website with their assigned passwords to complete the questionnaire. In the experiment, only one test sentence appeared on the monitor at one time. Participants were requested to make instant judgements and move on and not to change their answers later.

Some researchers, such as Hewson et al. (2003), hold that as respondents' true identities and independence cannot be easily verified, it is uncertain whether online responses are truthful. By contrast, Gosling et al. (2004) find that data collected via internet questionnaire do not emerge as flawed and that the results derived are consistent with those collected from traditional samples. Moreover, unknown identity and falsification are not unique to web questionnaires; deception does occur in paper and face-to-face surveys as well.[12] Nonetheless, the issue of unknown identity and falsification is not a concern in our study because all the participants selected were known to one of the

12 See Gosling et al. (2004) and Wilson and Dewaele (2010) for detailed exposition of the advantages and disadvantages of internet questionnaires.

authors and because they would not gain anything by giving misinformation. Furthermore, individually allocated passwords were required of invitees for access in order to prevent unknown participants and repeated questionnaires. Most importantly, all responses were carefully scrutinised and removals made before analyses in order to minimise falsification.

As a further verification, before the main survey, a web questionnaire and an identical paper-based version were administered to two separate small groups of participants in a pilot study. The purpose was to compare the two results and findings derived from the two sets of data. Both web-based and paper-based participants were selected and invited personally. Only when learners had attained at least the primary level of proficiency in Chinese would they be invited to take part in the formal pilot test or the main study. On a random basis, equal numbers of participants were given either the web or the paper-based questionnaires. Either version of the questionnaires took the Chinese natives approximately 45 minutes and the English speakers 60 to 120 minutes to complete, depending on their proficiency levels. Data generated from the two versions were analysed separately and results compared. It was found that no significant differences existed between these two datasets. While the conclusion signified that the web survey was consistent with the paper-based one, such consistency also enhanced the reliability and validity of the main study.

Examples of four types of *wh*-questions in the study are given in (15), and Table 2 presents predictions for the answers to the *wh*-questions on the basis of transfer of the G-N discourse principle from learners' L1 English to their L2 Chinese.

Table 2: Predictions of the dative patterns in English-speaking CSL learners' responses to the four Chinese question forms (on the basis of L1 transfer of the G-N discourse principle).

Chinese dative *wh*-question forms						**G-N patterns predicted to be selected in English-speaking CSL learners' responses**				
[NP	V	NP	*WHAT*]	[DOC]	→	[NP	V	NP	*NP*]	[DOC]
		Given	New					Given	New	
[NP	V	*WHO*	NP]	[DOC]	→	[NP	V	NP to	*NP*]	[POC]
		New	Given					Given	New	
[NP	V	*WHAT* to	NP]	[POC]	→	[NP	V	NP	*NP*]	[DOC]
		New	Given					Given	New	
[NP	V	NP to	*WHOM*]	[POC]	→	[NP	V	NP *to*	*NP*]	[POC]
		Given	New					Given	New	

(15) a. *Xiao Li song-le Xiao Wang shenme?*
Xiao Li give-as-a-gift-PFA Xiao Wang what
'What did Xiao Li give Xiao Wang?'
b. *Wang Ming song-le shui yi-ben shu?*
Wang Ming give-as-a-gift-PFA who one-CL book
'To whom did Wang Ming give a book?'
c. *Li laoshi song-le shenme gei Xiao Zhang?*
Li teacher give-as-a-gift-PFA what to Xiao Zhang
'What did Teacher Li give to Xiao Zhang?'
d. *Zhang daifu song-le yi-ben shu gei shui?*
Zhang doctor give-as-a-gift-PFA one-CL book to who
'To whom did Doctor Zhang give a book?'

As the empirical study included CSL learners at the post-beginner level, efforts were made to design fairly simple test sentences. The contents involved only daily general knowledge, not knowledge of special topics. Test sentences were presented in Chinese characters, using a simple, active vocabulary. Words considered to be difficult for elementary learners were listed in a glossary with *pinyin*, a Chinese phonetic system, and English translation at the beginning of the task. In this way, it minimised the effect of extraneous factors and uncertainty factors (such as new vocabulary and infrequently used words). All test items and distractors were randomised, and two different versions (one with the test items in a reverse order) were administered so as to eliminate bias caused by order and/or fatigue effects.

As mentioned above, a PRT was implemented to collect data for the study reported in this article. The PRT is concerned with the grading of two ditransitive variants according to participants' preference in response to simple ditransitive *wh*-questions. The test presents a special case of selection problem with respect to the dative alternation phenomenon in a discourse. The PRT was designed to investigate whether English-speaking CSL learners observe the discourse principle of a "given preceding new" information order, or whether they follow the echoic rule preferred by native Chinese speakers in response to simple *wh*-questions.

A prototypical dative verb *song* 'give-as-a-gift' was chosen for the investigation. One rationale was that this Chinese verb permits two structural exemplars, the DOC [V NP NP] and the POC [V NP PP], as demonstrated in: *Xiao Ming song-le Lan Lan yi-ben zidian* 'Xiao Ming gave Lan Lan a dictionary as a gift' (DOC) and *Xiao Ming song-le yi-ben zidian gei Lan Lan* 'Xiao Ming gave a dictionary to Lan Lan as a gift' (POC). Another reason was that this verb in both languages is commonly used in daily discourse.

In order to avert the influence of "heaviness",[13] all NPs in the test items were short and simple, viz. the agent or the recipient was made up of a common name with two morphemes (e. g. Wang Ming) whereas the theme was formed by a simple ordinary word preceded by a number with classifier (e. g. *yi-fen liwu* 'a present').

The test comprised 4 *wh*-question types and 4 distractors. Two question types used *shui* 'who' before or after the theme respectively, as in (15b) and (15d). The other 2 types used *shenme* 'what' before or after the recipient respectively, as in (15c) and (15a). For each of the distractor or *wh*-question, 3 ditransitive structures were provided as answers, viz. the DOC [V NP NP], the POC [V NP PP] and the pre-verbal *gei* POC [*gei*-NP V NP] with the last serving as a distractor. Participants were asked to rank the 3 answers in terms of preference, with 1 as the most preferable, 3 the least preferable and 2 in between. However, in our data analysis, we converted most preferable into 3 and least preferable into 1 for the sake of clarity. Accordingly, the most preferable rank value in each answer is "3" (i. e. the most preferred) whilst the least preferable is "1" (i. e. the least preferred).

Participants were told to feel free to assign equal rank to more than one structure or different gradings to any of the 3 answers to each question. Failing this, they could choose either option (d) or (e). An example is given in (16).

(16) Question: *Wang Ming song-le shui yi-ben shu?*[14]
Wang Ming give-as-a-gift-PFA who one-CL book
'To whom did Wang Ming give a book?'
Answers: a. *Wang Ming song-le Xiao Lan yi-ben*
Wang Ming give-as-a-gift-PFA Xiao Lan one-CL
shu. ( )
book
'Wang Ming gave Xiao Lan a book.'

13 It is claimed that long, heavy, complex phrases have a propensity to occur at the end position of ditransitive constructions (Arnold et al. 2000; Hawkins 1994; Quirk et al. 1972; Stallings 1998; Wasow 1997a; 1997b, among others), thus affecting the selection of the DOC over the POC or vice versa, as shown in the following examples (from Arnold et al. 2000: 1):

(a) Chris gave a bowl of Mom's traditional cranberry sauce to Terry.

(b) Chris gave Terry a bowl of Mom's traditional cranberry sauce.

The DO structure in (b) is more preferable than the PO pattern in (a) owing to the heaviness of the theme.

14 *pinyin* transliteration, English gloss and translation were not given in the questionnaire. They are provided here for readers of this article.

b. *Wang Ming song-le yi-ben shu gei Xiao Lan.* ( )
Wang Ming give-as-a-gift one-CL book to Xiao Lan
'Wang Ming gave a book to Xiao Lan.'
c. *Wang Ming gei Xiao Lan song-le yi-ben shu.* ( )
Wang Ming for Xiao Lan give-as-a-gift-PFA one-CL book
'Wang Ming gave a book (to somebody) for Xiao Lan.'
d. I don't understand the question. ( )
e. The question is incorrect. ( )

The test items and distractors as well as the 3 answers within each test item were randomised to minimise any possible bias. In order to ensure that participants understood what they were required to do, 3 relevant examples were provided at the beginning of the PRT. Figure 3 is a screenshot of a test item.

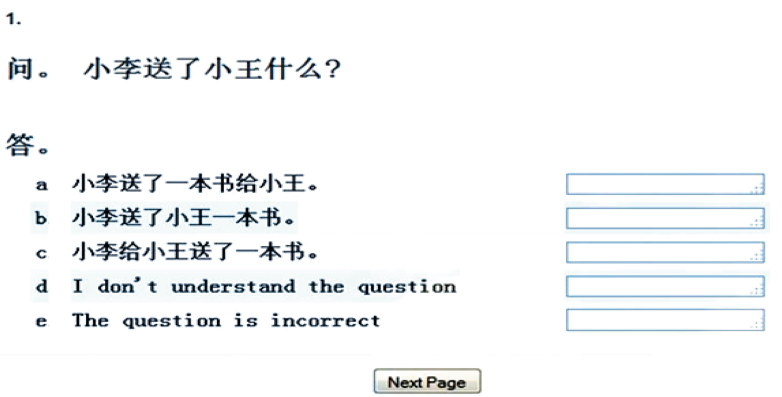


Figure 3: Screenshot of a test item in the PRT.

5.3 Results

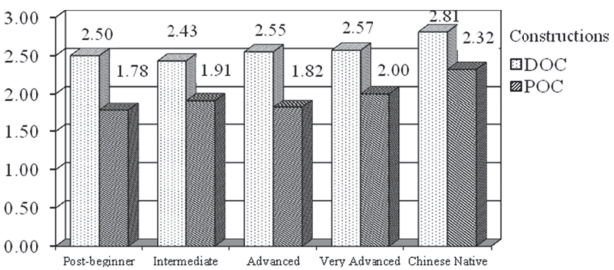
Let us first look at results concerning answers to *wh*-questions like (17).

(17) *Xiao Li song-le Xiao Wang shenme?*
Xiao Li give-as-a-gift-PFA Xiao Wang what
'What did Xiao Li give Xiao Wang?'

This *wh*-question has a pattern of [NP V NP *WHAT*] where *shenme* 'what' is positioned at the end after the recipient NP. As the principle of information

structure underlining the G-N order signifies that given information precedes new information, it is expected that English-speaking CSL learners would prefer the DOC to the POC in their response to the *wh*-question in (17). Conversely, echoicity assumes that in a dialogue, a respondent usually tends to repeat the information structure given in previous context. Thus, native Chinese speakers would imitate the given word order and opt for the DOC as the most preferable. As far as answers to questions like (17) are concerned, both the G-N information principle and the echoicity rule would make the same prediction, that is, the DOC would be the predominant choice for both CSL learners as well as native Chinese speakers. Participants' preference rankings are displayed in Figure 4.[15]

Rows of DOC and POC reveal mean rankings of the two alternants. All groups prefer the DOC to the POC as the mean ranking scores of the former are invariably higher than the latter. All standard deviations are low across all



Group		PB	INT	AD	VA	CN
DOC	μ	2.50	2.44	2.55	2.57	2.81
	δ	0.71	0.86	0.86	0.60	0.46
POC	μ	1.78	1.91	1.82	2.00	2.32
	δ	0.94	0.92	0.73	0.89	0.74
Wilcoxon Signed Rank test	Z	–2.07	–2.65	–2.49	–2.45	–2.63
$p \leq 0.05$	*p*	0.01	0.01	0.01	0.01	0.01

Note: = significantly different between the pair of constructions judged by the individual groups
μ = mean preference rating
δ = standard deviation

Figure 4: Statistical measures of preference ratings on the DOC and POC patterns and intra-group comparisons in response to the *wh*-question in (17).

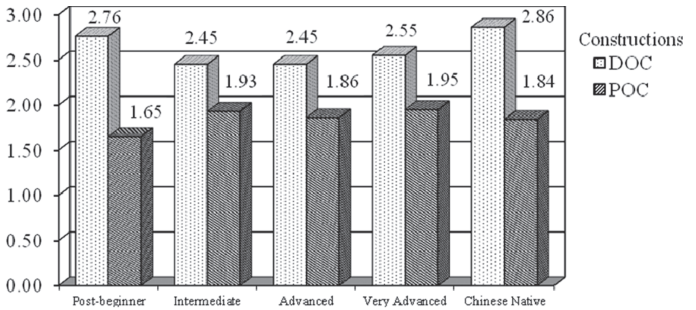
15 Since the pre-verbal *gei* PO pattern serves as a distractor only, its grading results will not be discussed. Analyses and discussion of participants' preferences will focus on the two alternating dative structures, i. e. the DOC and the POC.

groups, exhibiting a great degree of intra-group homogeneity. According to Kruskal-Wallis H tests ($\chi^2_{(4)} = 5.82$, $p = 0.21$ for DOC; $\chi^2_{(4)} = 8.27$, $p = 0.08$ for POC), no significant differences are found amongst any participant groups in ranking both alternants. This implies that all CSL groups' degrees of preference do not diverge from that of Chinese natives. A comparison of within-group preferences of the DOC to the POC reveals that all participants treat the two variants differently, preferring the former to the latter. As indicated by results of the Wilcoxon Signed-Ranks tests, significant differences between the two choices exist across the board, with the DOC scores consistently much higher than the POC scores, which suggests that the DOC is preferred by both CSL learners and Chinese controls. The results seem to suggest that CSL learners' L2 Chinese grammars converge on the target language Chinese in ranking the preference order of the two alternants. However, as the word order of G-N information in response to this question type coincides with the echoic rule, it would not be prudent to jump to conclusions without looking at other question types where the two rules are in conflict.

A distinctive property in Chinese is that a *wh*-word can be situated naturally in the middle or final position of a question. The *wh*-question in (18) has the DOC pattern of [NP V *WHO* NP], where *shui* 'who' is in the middle, after the dative verb and before the theme NP. If the G-N information rule is transferred from CSL learners' L1 English to their L2 Chinese, English-speaking CSL learners would choose the POC in answering questions like (18). However, native Chinese would prefer the DOC because the echoic rule is adhered to in Chinese. In this case, the two discourse rules are in conflict. Figure 5 presents participants' preference rankings in response to the Chinese *wh*-question in (18).

(18) *Wang Ming song-le shui yi-ben shu?*
Wang Ming give-as-a-gift-PFA who one-CL book
'To whom did Wang Ming give a book?'

As shown in Figure 5, all five groups, including the Post-beginner Group, have a strong preference for the DOC whereas the mean scores of the POC are substantially lower across the board. No significant differences are found between any group in their preference ratings of the DOC and the POC, as endorsed by results of the Kruskal-Wallis H test ($\chi^2_{(4)} = 8.18$, $p = 0.09$; $\chi^2_{(4)} = 1.28$, $p = 0.87$ respectively). This provides us with evidence that English-speaking CSL learners do not transfer the G-N discourse rule from their L1 English into their L2 Chinese discourse; they behave in a target-like fashion, following the echoic rule just like native Chinese speakers. Wilcoxon Signed Rank tests display significant differences between the DOC and the POC in each group's scores, suggesting that the



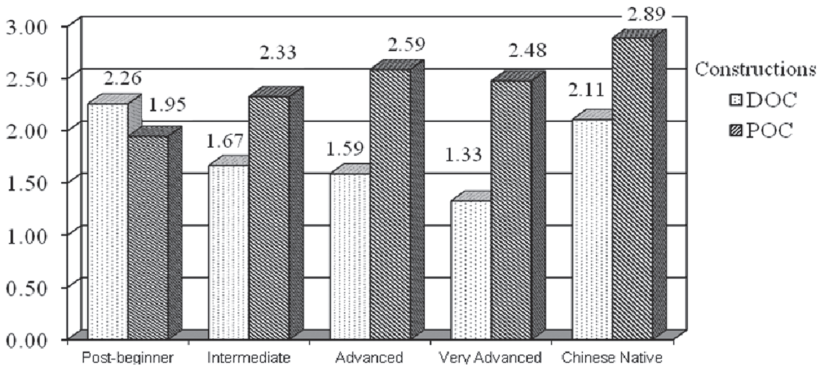
Group		PB	INT	AD	VA	CN
DOC	μ	2.77	2.45	2.46	2.55	2.87
	δ	0.44	0.89	0.80	0.69	0.42
POC	μ	1.65	1.93	1.86	1.95	1.84
	δ	1.00	0.81	0.71	0.89	0.90
Wilcoxon Signed Rank test	Z	–2.80	–2.45	–2.17	–2.29	–4.10
$p \leq 0.05$	*p*	0.01	0.01	0.03	0.02	0.01

Note: = significantly different between the pair of constructions judged by the individual groups
μ = mean preference rating
δ = standard deviation

Figure 5: Statistical measures of preference ratings on the DOC and POC patterns and intra-group comparisons in response to the *wh*-question in (18).

native group as well as the L2 groups all rank the two alternating structures differently, with the mean scores of the DOCs significantly higher than those of the POCs. The small standard deviations across all groups also signal high uniformity in their ranking of the two dative patterns. The data suggest that English-speaking learners of Chinese, including those at post-beginner level, follow the echoic rule like native Chinese, and there is no evidence of L1 transfer of information flow in their L2 Chinese discourse. The information pattern they adopt in answering *wh*-questions like (18) converges on that of the native Chinese; that is, they take on the echoic rule in the target language Chinese rather than the G-N information order adopted in their L1 English.

Like the case of the *wh*-question in (18), the *wh*-question in (19) can elicit answers of different patterns of information flow, depending on whether the G-N information rule or the echoic rule is adopted. The question has a form of POC, i. e. [NP V *WHAT* to NP], where *shenme* 'what' is in the middle position after the dative verb and before the PP. If English-speaking CSL learners are influenced



Group		PB	INT	AD	VA	CN
DOC	μ	2.26	1.67	1.59	1.33	2.11
	δ	0.65	1.00	0.85	0.80	0.86
POC	μ	1.95	2.33	2.59	2.48	2.90
	δ	1.13	0.80	0.73	0.75	0.31
Wilcoxon Signed Rank test	Z	–0.79	–2.77	–3.09	–3.37	–4.00
$p \leq 0.05$	*p*	0.43	0.01	0.01	0.01	0.01

Note: = significantly different between the pair of constructions judged by the individual groups
μ = mean preference rating
δ = standard deviation

Figure 6: Statistical measures of preference ratings on the DOC and POC patterns and intra-group comparisons in response to the *wh*-question in (19).

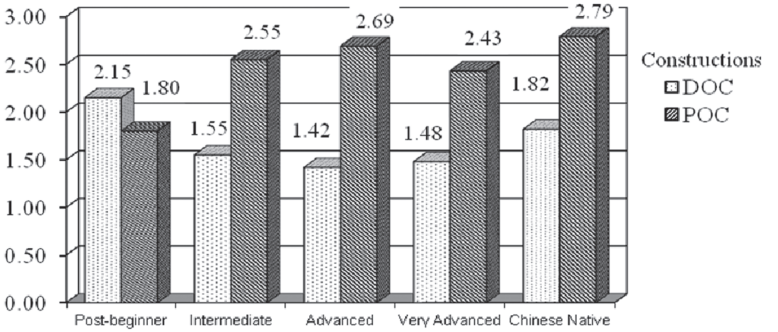
by the G-N information rule in their L1 English, they would answer this Chinese POC question by selecting the DOC, where the recipient *Xiao Zhang* is the known information and the unknown theme is the new information. On the other hand, if CSL learners adopt the echoic discourse rule, as preferred by native Chinese, they would simply echo the information pattern in the POC question and provide POC answers to questions like (19). Figure 6 provides data about participants' preference rankings in response to the *wh*-question type (19).

(19) *Li laoshi song-le shenme gei Xiao Zhang?*
Li teacher give-as-a-gift-PFA what to Xiao Zhang
'What did Teacher Li give to Xiao Zhang?'

Kruskal-Wallis H tests indicate that significant differences are found amongst groups in selecting the DOC ($\chi^2_{(4)} = 17.68$, $p = 0.01$) and the POC ($\chi^2_{(4)} = 19.18$, $p = 0.01$) as answers to the question in (19), and *post-hoc* Mann-Whitney tests indicate that a significant difference exists between the CN Group and every English-speaking group except for the PB Group, in the case of the DOC, and except for the VA Group, in the case of the POC. However, in spite of the differences between the native Chinese group and the two CSL learners' groups, all CSL learner groups, except for the Post-beginner Group, are able to make a significant distinction between the POC and the DOC in answering the POC question in (19), as shown in the results of Wilcoxon Signed Rank tests in Figure 6. That is, there is a significant preference of POC over DOC in CSL learners' answers to questions like (19), which indicates an operation of the echoic rule in CSL learners' handling of Chinese information discourse and also shows an absence of L1 transfer of the G-N information order in their L2 Chinese discourse.

As we can see from Figure 6, post-beginners' mean score of DOC is only numerically higher than POC in their answers to questions like (19), but they make no clear preference between DOC and POC as there is no significant difference in their ranking of DOC and POC answers. Given that post-beginners had no difficulty in adopting DOC in answering questions, as shown in Figures 4 and 5, it seems likely that some in the Post-beginner Group have difficulty in handling the preposition of *gei* 'to' in the syntactic POC pattern of [NP V NP *gei* NP], which obscures their preference of POC in answering the question in (19).

The *wh*-question in (20) has a POC of [NP V NP to *WHOM*], where *shui* 'whom' is positioned at the end of the structure as the object of the preposition *gei* 'to'. If L1 transfer of the G-N information order takes place in their L2 Chinese discourse, English-speaking CSL learners would select the POC and put the recipient (IO) as the new information after the given information *yi-ben shu* 'a book', i. e. at the end of the sentence. On the other hand, if CSL learners adopt the echoic rule, they would echo the pattern of the information flow of the previous question in their answers to questions like (20). This means that either the G-N information order or the echoic rule can lead to the same POC pattern in CSL learners' answers to the question in (20). Figure 7 shows groups' preference rankings in response to the *wh*-question in (20). As we can see, except for post-beginners, all groups' POC mean scores are much higher than their mean scores for DOC, and their standard deviations are low for both alternants, showing a great level of homogeneity in their rankings. This signals that the POC pattern is strongly preferred in response to *wh*-question in (20) by the groups.



Group		PB	INT	AD	VA	CN
DOC	μ	2.15	1.55	1.42	1.48	1.82
	δ	0.93	0.99	0.90	0.75	0.90
POC	μ	1.80	2.55	2.69	2.43	2.79
	δ	1.01	0.71	0.62	0.87	0.47
Wilcoxon Signed Rank test	Z	–1.277	–3.895	–3.418	–3.201	–4.030
$p \leq 0.05$	*p*	0.20	0.01	0.01	0.01	0.01

Note: = significantly different between the pair of constructions judged by the individual groups
μ = mean preference rating
δ = standard deviation

Figure 7: Statistical measures of preference ratings on the DOC and POC patterns and intra-group comparisons in response to the *wh*-question in (20).

(20) *Zhang daifu song-le yi-ben shu gei shui?*
Zhang doctor give-as-a-gift-PFA one-CL book to who
'To whom did Doctor Zhang give a book?'

Although the Post-beginner Group's ranking of DOC and POC in their answers to the question in (20) is anomalous in comparison with the other groups, all the other CSL learner groups behave native-like. In Kruskal-Wallis H tests for DOC ($\chi^2_{(4)} = 10.52$, $p = 0.03$) and POC ($\chi^2_{(4)} = 20.85$, $p < 0.01$), results of *post-hoc* Mann-Whitney tests reveal that no significant difference exists between the CN group and any of the CSL groups, except for the Post-beginner Group, in ranking DOC and POC answers to the question in (20). As we can see from Figure 7, except for the Post-beginner Group, all the other CSL groups, like

native Chinese, prefer POC over DOC in their answers to the question in (20). Results of Wilcoxon Signed Rank tests indicate that, except for post-beginners, all groups' POC mean scores are significantly higher than their DOC mean values. This is in conformity with both the G-N information order and the echoic rule, though.

Like their handling of answers to the question in (19), post-beginners are found to have no clear preference between the DOC and the POC in their answers to the question in (20); no significant difference exists in their ranking of these two patterns, as shown in Figure 7. Neither L1 transfer of the G-N information order nor the acquisition of the echoic rule seems to take place in post-beginners' answers to the question in (20), because either would help them put preference of POC over DOC in this case. We speculate that the lack of clear preference between POC and DOC in post-beginners' answers is likely to be due to the use of *gei* 'to' as a preposition in (20) as well as in (19).

Table 3 is a summary of our predictions and the actual results of the dative patterns in English-speaking CSL learners' responses to the four Chinese question forms. A general picture we can see from Table 3 is that unlike what we predicted in Table 2, English-speaking CSL learners do not transfer the G-N discourse rule from their L1 English into their L2 Chinese discourse; instead,

Table 3: Contrasts between our predictions and the actual results of the dative patterns in English-speaking CSL learners' responses to the four Chinese question forms (cf. Table 2).

Chinese dative *wh*-question forms					**Predicted patterns and actual patterns in English-speaking CSL learners' responses**				
[NP V	NP	*WHAT*]	[DOC]	Prediction→	[NP V	NP		*NP*]	[DOC]
	Given	New				Given		New	
				Actual result→	[NP V	NP		*NP*]	[DOC]
						Given		New	
[NP V	*WHO*	NP]	[DOC]	Prediction→	[NP V	NP	to	*NP*]	[POC]
	New	Given				Given		New	
				Actual result→	[NP V	*NP*		NP]	[DOC]
						New		Given	
[NP V	*WHAT* to	NP]	[POC]	Prediction→	[NP V	NP		*NP*]	[DOC]
	New	Given				Given		New	
				Actual result→	[NP V	*NP*	to	NP]	[POC]
						New		Given	
[NP V	NP to	*WHOM*]	[POC]	Prediction→	[NP V	NP	*to*	*NP*]	[POC]
	Given	New				Given		New	
				Actual result→	[NP V	NP	*to*	*NP*]	[POC]
						Given		New	

they follow the echoic rule just like native Chinese speakers. That is, whatever pattern (DOC or POC) is used in the *wh*-question, it is adopted in their answers.

6 Discussion

We saw above that the Post-beginner Group had native-like behaviours in their answers to questions in (17) and (18) but not in (19) and (20). A syntactic examination of these questions shows that the former have the structure of DOC and the latter POC, and that the preposition *gei* 'to' is involved in the latter but not the former. Li and Thompson (1981: 383) consider the word *gei* as a coverb which can fulfill the dual functions of either a verb or a preposition (Chao 1968; Li and Thompson 1981; Newman 1993). Indeed, it is a grammaticalised verb playing multiple syntactic roles depending on the word order, while still bearing some of its verbal meaning inherited even in the capacity of a preposition. When it occurs as a main verb in a sentence like (21), the meaning of *gei* is 'give' encoding the semantic notion of transfer from an agent/causer to an intended recipient. Likewise, it can be used as a pre-verbal preposition (meaning 'for') introducing a beneficiary, as in (22), as well as a post-verbal preposition (meaning 'to') introducing a recipient as in (19) and (20).[16]

(21) *Mali gei-le Yuehan yi-ben shu.*
Mary give-PFA John one-CL book
'Mary gave John a book.'

(22) *Zhangsan gei Lisi mai-le yi-ben shu.*
Zhangsan for Lisi buy-PFA one-CL book
'Zhangsan bought a book for Lisi.'

However, in previous studies, there has been a lack of consensus about the status of the post-verbal *gei* in structure [V NP *gei* NP] like (19) and (20). Some linguists treat it as a serial verb (Hsueh 1983; Huang and Mo 1992; Li 1985; Li 1990). Others advocate that it is a preposition (Ernst 1986; Ernst 1987; Ernst 1988; Zhang 1990). Nevertheless, the fact that it is a preposition can be testified by preposition stranding. As it is not allowed in Chinese, a prepositional phrase can only appear in the form of head-complement. Hence, the post-verbal *gei* in (23a) cannot be stranded, as exhibited in (23b).

16 See Lin (2015) for a detailed discussion of the behaviours of the word *gei* in Chinese.

(23) a. *Li laoshi song-le yi-ben shu gei Xiao Zhang.*
Li teacher give-as-a-gift-PFA one-CL book to Xiao Zhang
'Teacher Li gave a book to Xiao Zhang.'
b. **Xiao Zhang$_{i,}$ Li laoshi song-le yi-ben shu gei $t_{i.}$*
Xiao Zhang Li teacher give-as-a-gift-PFA one-CL book to

The above evidence suggests that post-verbal *gei* in the structural form of [V NP *gei* NP] is a preposition, not a verb. Therefore, it is not a serial verb construction, but a POC comparable to the English [V NP *to* NP].

The word *gei* 'give/for/to' is language-specific and encompasses a variety of syntactic forms and a broad range of lexical semantic features, covering multiple meanings of transfer. It is likely that the multi-functions of the Chinese word *gei* have led to some degrees of difficulties at early stages of L2 Chinese, which accounts for post-beginners' handling of questions in (19) and (20) and the related answers in our study.

Our data have demonstrated clearly that there is no evidence of transfer of the G-N information rule from CSL learners' L1 English to their L2 Chinese and that like native Chinese speakers, English-speaking CSL learners overwhelmingly prefer the echoic discourse rule over the G-N information order in their answers to both DOC and POC questions in Chinese. This absence of L1 transfer in English-speaking CSL learners' L2 Chinese discourse constitutes a striking contrast with the robust evidence of L1 transfer in Chang's (2001b, 2004) studies of Chinese-speaking ESL learners' discourse in answering English DOC and POC questions. Recall that in Chang's studies, Chinese-speaking ESL learners, who had learned English for many years and had reached intermediate and even high-intermediate levels of English language proficiency, were still strongly influenced by their L1 Chinese echoic rule and that they persistently echoed the structure of the question in their answers, in spite of the fact that their answers to the question violate the G-N information order favoured by the target language English. The effect of this L1 transfer is so strong in Chinese-speaking ESL learners' L2 discourse that it is persistent throughout all intermediate stages (and probably also earlier stages) of their L2 English.

The findings here do not seem to support the "Full Transfer" model proposed by Schwartz and Sprouse (Schwartz 1998; Schwartz and Sprouse 1994; Schwartz and Sprouse 1996), which claims that the end state of L1 acquisition is the initial state of the L2 acquisition, and that the L1 grammar is transferred to the L2 initial state in its entirety. If the "Full Transfer" model is correct and if discourse rules are included in what is transferred from learners' L1 to their L2, Chinese-speaking ESL learners and English-speaking CSL learners are expected

to be equally influenced by rules in their L1 discourse. However, the data in our study and in Chang's (2001b, 2004) show that this is not the case and that directionality is involved in L1 transfer. The findings here actually support Yuan's (2001) argument that L1 transfer is a relative phenomenon in L2 acquisition rather than an absolute phenomenon and that L1 transfer is not everywhere. His argument is based on data concerning thematic-verb raising collected from French-, German- and English-speaking learners of L2 Chinese. Thematic verbs are allowed to raise in French and German, but not in English and Chinese, and Yuan's findings show that neither French- nor German-speaking learners of L2 Chinese are influenced by the thematic-verb raising in their L1 French and German, which shows clear absence of L1 transfer in L2 acquisition.

Absence of L1 transfer in L2 acquisition can also be found in L2 French. In a study of English speakers' L2 acquisition of French relative clauses, passives, verb raising, and gender and number agreement on accusative clitics, Scheidnes et al. (2009) found that the relevant aspects of English speakers' L2 French grammars are influenced by the computational complexity of the constructions concerned but not by the differences between French and English. In another study, Scheidnes and Tuller (2010) examined elicited production of French *wh*-questions by English-speaking learners of L2 French. It is found in the study that English speakers used significantly more *wh*-in-situ in their L2 production of French *wh*-questions than native French speakers, in spite of the fact that it is generally not allowed in their L1 English *wh*-questions. In addition, advanced L2 learners used significantly less subject-verb inversion in their L2 French *wh*-questions than native French speakers, and intermediate learners did not use the inversion at all, even though this is required in their L1 English *wh*-questions. Based on these data, the authors argue that computational complexity can override L1 transfer in the production of L2 French *wh*-questions. Similarly, absence of L1 transfer is also found in a study of child L2 French by Prévost et al. (2014).

In a study of attitude-bearing *wh*-questions in English speakers' L2 Chinese, Yuan (2015) finds that although the *wh*-word in English *wh*-questions moves to the sentence initial position while that in Chinese stays in situ, *wh*-movement in English *wh*-questions is not transferred into English speakers' L2 Chinese. On the basis of his findings, Yuan argues with Scheidnes and Tuller (2010) and Prévost et al. (2014) that L1 transfer can be overridden by computational complexity. That is, L2 learners are sensitive to complexity involved in the language they are dealing with. Syntactically, verb-raising is more complex than verb-in-situ, and so is *wh*-movement than *wh*-in-situ. This is also the case with the requirement of the subject-verb inversion in comparison with no requirement of such an inversion. In this sense, L1 transfer can be overridden by linguistically less complex options available to L2 learners. An important theme in Chomsky's (1995, 1998)

Minimalist Program is that linguistic operations are subject to the principle of economy and that the derivations should be as small as possible and be applied in a way that minimises computation. In this sense, verb-in-situ, *wh*-in-situ or non-subject-verb inversion is more economical and less costly than verb-raising, *wh*-movement or subject-verb inversion. If Universal Grammar is available in L2 acquisition, it should not be surprising that the principle of economy can override L1 transfer in L2 acquisition, even at early stages.

It seems that the analysis of L1 transfer overridden by computation complexity and the economy principle can also apply to L2 discourse options of the echoic rule vs. the G-N information order. As Tannen (1989; 2007) points out, echoing economises the resource for production and comprehension. In the cases we have discussed in this article about L2 English and L2 Chinese discourse, the DOC or the POC in the *wh*-question would trigger the matching structure in learners' L2 English or L2 Chinese grammars for the answer to the *wh*-question, which is a more economical and less costly option than the G-N information order, which may require a costly and complex operation of constructing a DOC or a POC pattern different from that used in the question. We believe that this is a feasible account for the directionality of L1 transfer reported in this article. In Chang's (2001b, 2004) studies, Chinese-speaking ESL learners are found to be very much influenced by the echoic rule favoured in their L1 Chinese, even among learners at intermediate and high-intermediate levels who had studied English for many years. Given the concept of computational complexity and the economy principle, it should be expected that Chinese-speaking ESL learners would transfer the echoic rule from their L1 Chinese to their L2 English discourse.[17] In contrast, English-speaking CSL learners would not transfer the G-N information order from their L1 English into their L2 Chinese discourse and would go directly for the more economical and less costly option of the echoic rule. This can count as evidence of L1 transfer overridden by the computational complexity and the economy principle.

In spite of the evidence of the absence of L1 transfer obtained in our study here, which forms a striking contrast with the findings of L1 transfer in Chang's (2001b, 2004), we have to treat our data with some degree of caution. As pointed out by an *IRAL* reviewer, Chang's studies and ours used different methods; in the former, it is reading-writing which involved production skills, and in the latter, it is reading-ranking which mainly involved perception skills. Future

17 The data in Chang's (2001b, 2004) studies also show that Chinese-speaking ESL learners at advanced levels tend to make progress in adopting the G-N information order preferred by native speakers of English. This is likely to be due to a long exposure to positive evidence in native English speakers' dialogues, where the G-N information order is preferred.

research is needed to further investigate the directionality of L1 transfer in L2 acquisition with comparable tasks.

7 Conclusion

We conclude that the findings reported in this article support Yuan's (2001) argument that L1 transfer is not everywhere in L2 acquisition and that it should count as a relative phenomenon in L2 acquisition rather than an absolute phenomenon. There are indeed pervasive influences of learners' L1 in their L2 acquisition, but L1 transfer can be directional as a result of computation complexity and the economy principle. This directionality of L1 transfer may exist in L2 discourse, L2 syntax, and probably in other L2 domains as well.

Acknowledgements: We would like to express our sincere thanks to all the participants in this empirical study. Without their participation and support, this project would have been very difficult, if not impossible. Thanks also go to *IRAL* reviewers for their insightful comments on and suggestions for earlier versions of this article. In addition, we would like to acknowledge the support that the first author received for this project from the National Research Centre for Foreign Language Education (MOE Key Research Institute of Humanities and Social Sciences at Universities), Beijing Foreign Studies University, China, where he has been an Overseas Research Fellow.

Appendix A: Distribution and percentage of English-speaking CSL participants by location

A	B	C
Location	**No. of CSL participants**	**Percentage(B/121*100 %)**
Australia	***11***	***9.09***
Canada	***13***	***10.74***
China	***18***	***14.88***
Hong Kong	***7***	***5.79***
UK	***32***	***26.44***
USA	***22***	***18.18***
Others	***18***	***14.88***
Total	121	100

Appendix B: Distribution of CSL participants in each location and university/institution/ company as well as percentage of participants having been to Chinese-speaking areas

A	B	C	D	E
Location	**University/Institution/ Company**	**No. of CSL participants**	**No. of CSL participants having been to Chinese-speaking areas**	**Percentage (D/C*100 %)**
Australia		***11***	***10***	***90.91***
Canberra	The Australian National University	11	10	
Canada		***13***	***12***	***92.31***
Montréal	HEC Montréal	6	5	
Vancouver	University of British Columbia	7	7	
China		***18***	***18***	***100.00***
Beijing	Beijing University	3	3	
	Beijing Language and Culture University	3	3	
	Capital Normal University College of International Education	2	2	
	Tsinghua University	10	10	
Hong Kong		***7***	***7***	***100.00***
Shatin	Chinese University of Hong Kong	3	3	
Pokfulam	University of Hong Kong	4	4	
UK		***32***	***28***	***87.50***
Cambridge	University of Cambridge	10	9	
Edinburgh	University of Edinburgh	3	3	
Leeds	University of Leeds	1	1	
London	University of London: School of Oriental and African Studies	8	6	
	The London School of Economics and Political	1	1	

(*continued*)

(*continued*)

A	B	C	D	E
Location	**University/Institution/ Company**	**No. of CSL participants**	**No. of CSL participants having been to Chinese-speaking areas**	**Percentage (D/C*100 %)**
	Science			
	University College London	1	0	
Nottingham	University of Nottingham	2	2	
Oxford	University of Oxford	5	5	
Sheffield	University of Sheffield	1	1	
USA		***22***	***20***	***90.91***
Berkeley, California	University of California Berkeley	2	2	
San Diego, California	University of California San Diego	1	1	
New Haven, Connecticut	Yale University	2	2	
Manoa, Honolulu	University of Hawaii at Manoa	3	3	
Chicago, Illinois	University of Chicago	1	1	
Wellesley,	Massachusetts	Babson College	1	1
Ann Arbor, Michigan	University of Michigan	1	1	
Kalamazoo, Michigan	Western Michigan University	1	1	
Minneapolis, Minnesota	University of Minnesota	1	1	
New York City	Columbia University	6	5	
New York City	New York University	1	1	
Syracuse, New York	Syracuse University	1	1	
Durham, North Carolina	Duke University	1	0	
Others	professional institutions/companies	***18***	***18***	***100.00***
Total		**121**	**113**	**93.39**

Note: the percentage of CSL learners recruited from the universities: 85.12 % (103/121*100 %), and that from the professional institutions/companies: 14.88 % (18/121*100 %).

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