A User-Based Approach to Spanish-Speaking L2 Acquisition of Chinese Applicative Operation

Nana Y-H Huang
Cambridge University
yhh28@cam.ac.uk

1 Introduction: Low Applicative Operations

Recent studies of argument structure distinguishes non-core (applied) arguments from core arguments in the sense that non-core ones do not belong to the basic argument structure of verbs and that they enter argument structures through Applicative Operations (AO) introduced by functional heads such as Low Applicative-source (LA-source) or Low Applicative-goal (LA-goal) heads (Pylkkänen, 2000; 2002; 2008; Cuervo, 2003). Because languages make use of different applicative heads, in this study, I examine the acquisition of Chinese AO by Spanish-speaking L2 learners and propose a usage-based approach for the results collected from a comprehension task and an acceptability judgment task.

1.1 Applicative Operations in Spanish

Cuervo (2003) reports that in Spanish a predicate which expresses the transfer of a theme to a goal, such as verbs indicating creation (e.g. cocinar 'cook/bake', construer 'build', and etc.), allows LA-goal, where the applied argument is the dative argument, as in (1).

(1) Valeria le diseñó una pollera a Anna.
Valeria CL designed a skirt DAT Anna
Lit.: 'Valeria designed Anna a skirt.'

A Spanish applied argument can also appear in the environment of a transfer predicate with 'reverse directionality', such as robar 'steal', sacar 'take from', and extraer 'take out from'. In this case the applied argument is understood as the possessive source of the theme object.

(2) Pablo le robó la bicicleta a Anna.
Pablo CL stole the bike DAT Anna
Lit.: 'Pablo stole Anna the bike.'

The source argument appears in dative case which has the same morphosyntactic properties of a recipient argument; therefore, it is predicted that in the context of verbs with underspecified directionality (e.g., vender 'sell' and alquilar 'rent') and verbs of motion (e.g., lanzar 'throw' and pataer 'kick'), the applied argument would be ambiguous between a goal and a source. Cuervo provides such an example as (3).

(3) Valeria le vendió el auto a su hermano.
Valeria CL sold the car DAT her brother
1. Valeria sold the/her car to her brother.
2. Valeria sold her brother's car.

1.2 Applicative operations in Chinese

In Chinese, AO is as productive; nevertheless, unlike Spanish, Chinese only allows LA-source (see (4)) but not LA-goal (see (5)):

(4) Zhangsan tou-le Lili liang tai diannao.
Zhangsan steal-PERF Lili two CL computer
'Zhangsan stole Lili of two computers.'

(5) *Zhangsan sheji-le Lili liang jian qunzi.
Zhangsan design-PERF Lili two CL skirt
'Zhangsan designed Lili two skirts.'

1.3 Research Questions

This study examines Spanish L2ers' acquisition of Chinese AO and considers the learnability problem posed by the superset-subset relation between Spanish and Chinese on this structure (i.e. Spanish allows both LA-goal and LA-source while Chinese allows only LA-source). We predict learners to wrongly transfer LA-goal, which is allowed in L1 Spanish, to L2 Chinese despite the lack of positive evidence for the use of LA-goal in L2 input. Furthermore, due to lack of negative evidence (from the fact that AO do not appear in pedagogical textbooks nor in classrooms designed for L2ers), L2 Chinese input lacks information regarding ungrammaticality of LA-goal, which would be necessary for L2ers to rule out incorrect hypotheses. That is, these learners are expected to show overgeneralization from early on till even at the advanced level.

In Vito Pirrelli, Claudia Marzi, Marcello Ferro (eds.): *Word Structure and Word Usage*. Proceedings of the NetWordS Final Conference, Pisa, March 30-April 1, 2015, published at http://ceur-ws.org

2 Methods

To test our prediction on L1 transfer effects we designed two tasks to probe different knowledge of L2 structures: one being implicit and meaning–focused; the other being explicit and form-focused.

2.1 Materials and Procedures

An Animation Matching Task (AMT) was used to probe L2er's implicit knowledge because it called for a focus on meaning. The AMT included 12 items (6 test sentences and 6 fillers). The 6 test sentences included verbs underspecified for directionality of transfer. The 6 fillers bore only surface similarity and served to distract participants' focus in different ways. 2 contained syntactically unacceptable sentences; another 2 contained sentences that matched both animations; the other 2 contained sentences that matched neither of the two animations. See Appendix A.

On each trial, the L2ers first saw 2 animations on the computer screen. Next, they heard the target sentence presented auditorily. Participants were required to match the sentence to the correct animation. For example,

(6) Zhansan reng-le Lisi yi jian waitao.

Zhangsan toss-PERF Lisi one CL coat

Lit: 'Zhangsan tossed Lisi one coat.'

The sentence was preceded by two animations: (a) Zhangsan tossed one coat to Lisi; (b) Zhangsan tossed one of Lisi's coats away. Participants chose which animation was a better match for the sentence by ticking the answer on the answer sheet. They were told at the beginning of the test that if they found both animations matching the sentence, they could select both. If they found neither matching the sentence or if they could not understand the sentence, they could choose 'don't know' option on the side and choose/state the reason. See Appendix B.

Following the AMT was the Acceptability Judgment Task (AJT), which tapped participants' explicit knowledge on forms. 2 different types of verbs that induced opposite directionality of transfer (i.e., grammatical LA-source and ungrammatical LA-goal) were included, 3 items per type. In addition, with 6 control sentences and 6 fillers, the AJT contained 18 items in total, half grammatical and half ungrammatical. Please see Appendix C. Rating scale ranged from very unacceptable (1), unacceptable (2), acceptable (3), to very acceptable (4). A 'don't know' option was provided on the side which learners could choose if they were unsure of the response. See Appendix D.

2.2 Participants

20 L2ers and 10 natives speakers (NS) of Chinese serving as a control group participated in this study. All NS were graduate students born and raised in Taiwan. Most L2ers were undergraduate students with the exception of 3 people being Catholic priests. L2ers had learned Chinese in Taiwan for at least 3 years and came from different Spanish-speaking countries. Spanish was the native language for all L2ers. English was the second most proficient language.

Before the study, L2ers had completed a 40-item Chinese proficiency cloze test developed by Yuan (2014). Based on the scores, they were divided into Advanced (AD) and Intermediate (IN) group. Table 1 summarizes the participants' background information and cloze test scores.

Group	NS	AD	IN
Number of participants	10	10	10
Mean age (ranges in brackets)	26.2 (22-28)	26.9 (23-38)	24.1 (20-36)
Duration (years) of formal instruction	NA	8.4	5.7
Length (years) of residence in Taiwan	NA	5.7 (3-11)	4.8 (3-9)
Cloze test score (ranges in brackets)	39 (38-40)	35 (33-37)	29 (27-32)

Table 1: Participants' Background Information

3 Results and discussion

Table 2 presents the percentage of how often participants chose a certain animation in the AMT (for example, the (a) condition in example (6) above depicts a Goal condition).

Group	Source	*Goal	*Both	Don't know
NS	100	0	0	0
AD	57	10	33	0
IN	23	17	57	3

Table 2: Percentages of choice in the AMT

A 2-sample z-test was performed separately to compare proportions between any 2 among the 3 groups. The results showed that any 2 groups were significantly different from each other in the choice for Source and for Both, but not significantly different in Goal. IN group as expected showed overgeneralization in wrongly choosing Both, while AD group seemed to be able to overcome overgeneralization and limit the construction of Chinese AO to LA-source from the fact that the choice for Both was greatly decreased and that for Source was greatly increased at the higher proficiency level.

As for the AJT, Table 3 presents the mean scores with the standard deviation in the brackets of each group by verb types. Using an alpha level of 0.05, paired t-tests showed that only NS exhibited significant difference in the responses to 2 types of verbs, while L2 groups did not.

Group	Verb type	
	Consumption	Creation
NS	3.53(0.39)	1.36(0.24)
AD	3.22(0.54)	3.33(0.44)
IN	3(0.34)	3.23(0.38)

Table 3: Mean scores for the AJT

In contrast with the result in Table 2, AD group did not perform better in AJT than IN group in rejecting ungrammatical AO-Goal introduced by verbs of creation. The question is how we can explain for AD group's inconsistency in overcoming overgeneralization.

Notice that the major difference between the 2 tasks is whether the verb specifies directionality of transfer. Verbs included in the AMT are the verbs that do not favor a particular direction of transfer and therefore the introduced applied argument is inherently ambiguous between Goal and Source in the L1 Spanish. In other words, the verbs that trigger ambiguity in L1 Spanish are where subjects first overcome overgeneralization.

It is, therefore, proposed that subjects' experience in L1 to resort to context in the face of ambiguity caused by verbs underspecified for directionality helps advanced L2ers overcome overgeneralization. The sensitivity trained in L1 is transferred to L2 learning and displayed in that more attention is paid to the co-occurring applied argument in the face of ambiguous thematic role assigned to applied argument. Advanced L2ers might have accumulated enough indirect statistical information (Reali and Christiansen, 2005) tracked from co-occurrences of recurring sequences of words before being able to overcome overgeneralization. This finding suggests that the effects of L1 transfer result not only from the similarity and/or difference of linguistic facts between the native and the target language, but also from L2ers' experience gained in their native language.

References

C. Cuervo. 2003. Datives at Large. PhD Thesis. MIT.

C. J. Huang. 2007. Hanyu dongci de tiyuan jiegou yu qi jufa biaoxian (The thematic structures of verbs in Chinese and their syntactic projection). *Yuyan Kexue* (Linguistic Sciences) 6(4): 3-21.

B. MacWhinney. 2004. A multiple process solution to the logical problem of language acquisition. *Journal of Child Language*, 31, 833-914.

L. Pylkkänen. 2000. What applicative heads apply to. In M. Minnick, A. Williams, and E. Kaiser (eds.), working papers in *Proceedings of the 24th Annual Penn Linguistics Colloquium* 7(1).

L. Pylkkänen. 2002. Introducing Arguments. PhD Thesis. MIT.

L. Pylkkänen. 2008. Introducing Arguments. Cambridge, MA: MIT Press.

F. Reali and M. Christiansen. 2005. Uncovering the richness of the stimulus: Structure dependence and indirect statistical evidence. *Cognitive Science*, 29, 1007-1028.

T. Q. Sun and Y. F. Li. 2010. Hanyu fei hexin lunyuan yunzhun jiegou chu tan (Licensing non-core arguments in Chinese), Zhongguo Yuwen (*Studies of the Chinese Language*) 334: 21-33.

B. Yuan. 2010. Domain-wide or variable-dependent vulnerability of the semantic-syntax interface in L2 acquisition? Evidence from wh-words used as existential polarity words in L2 Chinese grammars. *Second Language Research* 26: 219-60.

Appendix A: Test Sentences in the AMT

Type of Verbs	Item	Question Number	Target Sentence
Test sentences	na2 'take'	1	小明拿了小華一本雜誌
	ban1 'carry'	6	小張搬了小李一張桌子
	reng1 'toss'	9	張三扔了李四一件外套
	tou1 'steal'	3	阿明偷了阿華兩瓶可樂
	mai4 'buy'	8	張三買了李四一支毛筆
	ying2 'win'	12	小張贏了小李一隻手錶
Fillers	sha1 'kill'	2	小明殺了小華兩頭小羊 (matches both)
	gei3 'give'	7	老李給了老張一隻小鳥 (matches both)
	dao3 'collapse'	10	老王倒了小李一棵小樹 (ungrammatical)
	gei3 'give'	4	老李關了老張一隻小鳥 (ungrammatical)
	song4'give'	5	小華送了小李兩瓶可樂 (matches neither)
	jiao1 'teach'	11	張三教了瑪莉兩題數學 (matches neither)

Appendix B: Sample Answer Sheet of the AMT

Question Number	Which Animation do you choose?		If you tick 'I don't know', please tick or state the reason
1.	☐ A ☐ B	☐ I don't know	☐ Neither of the two animations is correct. ☐ I do not understand the sentence that I heard. ☐ Other reason _____

Appendix C: Test sentences in the AJT

Type of Verbs	Item	Question Number	Target Sentence
Verbs of Consumption	chi1 'eat'	1	李四吃了張三兩個蛋糕
	he1 'drink'	8	小華喝了小明兩瓶紅酒
	yong4 'use'	17	小李用了小張一支鉛筆
Verbs of Creation	kao3 'bake'	6	*阿華烤了小明一個蛋糕
	zhu3 'cook'	12	*小李煮了老張一頓晚餐
	zao4 'build'	14	*張三造了老李一棟房子
Control Sentences	chi1 'eat'	2	李四吃了兩個蛋糕
	he1 'drink'	9	小華喝了兩瓶紅酒
	yong4 'use'	13	小李用了一支鉛筆
	kao3 'bake'	4	阿華烤了一個蛋糕
	zhu3 'cook'	11	小李煮了一頓晚餐
	zao4 'build'	16	張三造了一棟房子
Fillers	gei3 'give'	3	老李給了老張一隻小鳥
	song4 'give'	7	小華送了小李兩瓶可樂
	jiao1 'teach'	15	張三教了瑪莉兩題數學
	gei3 'give'	5	*老李給了隔壁老張
	song4 'give'	10	*小華送了鄰居小李
	jiao1 'teach'	18	*張三教了同學瑪莉

Appendix D: Sample Answer Sheet of the AJT

	Very Unacceptable	Unacceptable	Acceptable	Very Acceptable	
1. 阿明吃了我兩個蛋糕。	1	2	3	4	☐ I don't know