

Argument Control and Mapping Theory: Evidence from the *HO* Construction in Taiwanese

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Abstract

The Lexical-Mapping Theory (LMT) in Lexical-Functional Grammar (LFG) predicts syntactic representations by mapping from the lexical predicate argument structure of the verbs (Bresnan and Kanerva 1989). Yet the widely followed account of control still is Bresnan's (1982) functional control based on grammatical functions and structural terms. In this paper, we try to propose a theory of control in line with the LMT theory. The new control mechanism is called Argument Control.

Facts involving the *HO* construction in Taiwanese will be given first to show the inadequacy of Functional Control. Then, based on the observation that the *HO* construction in Taiwanese manifests a semantic alternation determined by both the property of the matrix subject and of the embedded subject, we propose the theory of argument control. In this theory, the control relation lies between two thematic roles.

1. Introduction

Bresnan and Kanerva (1989) proposes Lexical-Mapping Theory (LMT) to correlate the syntactic structures and representations with the predicate argument structure of verbs. In this theory, the syntactic representation is determined by the predicate argument structure of a verb.

However, widely accepted LMT account has not been given to the control structure : the widely adopted theory of control is still Bresnan's functional control based on grammatical functions and structural terms instead of the predicate argument structure of verbs. Examining the semantic alternation of the *ho* construction in Taiwanese, which will be given in Section 2, we find that functional control cannot account for the phenomenon satisfactorily and then we propose argument control both to replace functional control and to try to be in line with the essences of LMT.

2. The *HO* Construction in Taiwanese

2.1 *HO* as a Control Verb

In this section, we prove that *ho* is a control verb that takes an open complement as one its arguments.

1. a. i kong i u lu-peng-yu
he say he have girl-friend
'He said that he had a girl-friend.'

- b. i ane kong ke
he so say PST
'He said so.'

2. a. a-bin ho in bo chin siong-sim
 A-bin CST¹ his wife very sad
 'A-bin made his mother very sad.'
- b. *a-bin ane ho goe
 A-bin so CST PST
3. a. ma-ma ho lan khi khoaⁿ tian-yiaⁿ
 mother PMS us go see movie
 'Mother allowed us to go to a movie.'
- b. *ma-ma ane ho koe
 mother so PMS PST
4. a. ma-ma kho-khng a-bin khi khoaⁿ i-sing
 mother persuade A-bin go see doctor
 'Mother persuaded A-bin to see a doctor.'
- b. *ma-ma ane kho-khng koe
 mother so persuade PST

kong 'to say' is a verb taking a sentential complement, and *kho-khng* 'to persuade' is a verb taking an object and an open complement whose subject is the matrix object, that is, *i u lu-peng-yu* 'he had a girl-friend' in (1a) is a constituent, but *a-bin* 'A-bin' and *khi khoaⁿ i-sing* 'to see a doctor' in (4a) do not belong to the same constituent. This can be attested by the replacement of proforms as in (1b) and (2b). *i u lu-peng-yu* 'he has a girl friend' in (1b) can be replaced by a proform *ane* 'so', and this is proved to be a constituent. However, *a-bin khi khoaⁿ i-sing* in (4a) cannot be replaced by a proform *ane* 'so', and this suggests that *a-bin khi khoaⁿ i-sing* is not a clausal constituent.

The same test can be applied to *ho* sentences (2a) and (3a). As we can see that (2b) and (3b) are ungrammatical, this indicates that the words after *ho* do not belong to the same constituent, just as (4). That is, *ho* 'to make or to allow' is a verb taking an object and an open complement, just like *ko-kng* 'to persuade'. Using the proform replacement test, we can prove that *ho* 'to make or to allow' is a verb like *kho-khng* 'to persuade', taking an object and an open complement.

2.2 The *HO* Construction

A very important feature of the *ho* construction is its alternation between a cause-effect interpretation and a permission interpretation. We, first, show the alternation of the interpretations and, then, point out how this alternation is determined.

2.2.1 The Semantic Alternations

5. a. a-bin ho in ma-ma chin siong-sim
 A-bin CST his mother very sad

'A-bin made his mother very sad.'

- b. a-bin ho in ma-ma chin siong-sim, *long bo ka tong
 A-bin CST his mother very sad all no DISP stop
 'A-bin made his mother very sad, *without stopping him.'

6. a. a-pa ho lan khi chito
 Father CST us go play
 'Dad let us go to play.'

- b. a-pa ho lan khi chito, long bo ka lan tong
 Father CST us go play, all no DISP us stop
 'Dad let us go to play without stopping us'

With a phrase *long bo ka tong* 'without stopping somebody', which can make the seemingly implicit permission interpretation explicit, the alternation can be seen from the ungrammaticality of (5b) and the grammaticality of (6b). With this cause/permission distinction made, the question can be answered why some *ho* sentences with a phrase like *long bo ka tong* 'without stopping somebody' are good and the others are bad.

2.2.2 How the Alternation Is Determined

This alternation is dependent on the property of the matrix subject and of the embedded subject. We assign a feature Authority [+A] to human or institution matrix subjects both of which have the abilities to allow or permit. When the matrix subject is an event or non-human, then, it will be assigned a feature [-A]. The thematic role which the embedded subject receives will also influence the semantics. Let's see the following chart:

embedded subject matrix subject	patient	experiencer	theme ²	agent
+A	causative	causative	permissive	permissive
-A	causative	causative	ungrammatical	causative

The first column represents the property of the matrix subject and the first row represents the thematic roles the embedded subject receives. These two properties interact to determine the semantics of *ho*.

We use the following examples to illustrate what the chart means.

7. a. a-bin be ho a-hoa si bo chong sin chi toe
 A-bin want CST A-hoa die no bury body of ground
 'A-bin wants to make A-hoa suffer the worst death.'

- b. a-hoa ane cho e ho i-kaki si bo chong sin chi toe
 A-hoa so do will CST himself die no bury body of ground

'That A-hoa does so will make himself suffer the worst death.'

8. a. A-hoa be ho a-ha koe-tio khoai-lok e lit-chi
A-hoa will CST A-ha live happy of day
'A-hoa will make A-ha live a happy life.'
- b. ke a-bin e ho a-ha koe-tio khoai-lok e lit-chi
marry A-bin will CST A-ha live happy of day
'Marrying A-bin will make A-ha live a happy life.'
9. a. goa e ho li oa ka pa li he
I will CST you live EXT hundred two age
'I will make you live up to the age of one hundred and twenty.'
- b. tak kang un-tong e ho li oa ka pa li he
each day exercise will CST you live EXT hundred two age
'Taking exercise every day will make you live up to the age of one hundred and twenty.'

The subjects of (7a), (8a) and (9a) are [+A] and those of (7b), (8b) and (9b) are [-A]. As the six examples show, when the embedded subject receives a patient role, regardless of the property of the matrix subject, the sentence will be causative.

10. a. a-bin ho in ma-ma chin siong-sim
A-bin CST his mother very sad
'A-bin made his mother very sad.'
- b. i ko bo-tiau ho in ma-ma chin siong-sim
he examine fail CST his mother very sad
'His failing in the exam made his mother very sad.'
11. a. a-hoa ho a-bin chin hoaⁿ-hi
A-hoa CST A-bin very happy
'A-hoa made A-bin very happy.'
- b. a-hoa ane cho ho a-bin chin hoaⁿ-hi
A-hoa so do CST A-bin very happy
'A-hoa's doing so made A-bin very happy.'

siong-sim 'to be sad' in (10) and *hoaⁿ-hi* 'to be happy' in (11) take an experiencer role, and then regardless of the property of the matrix subject, the sentences in (10) and (11) are causative.

12. a. i ho i e tian-si tio ane phai khi, long bo ka chhap
he PMS his TV just so broken go all no DISP dispose
'He let his TV broken without doing anything.'
- b. *chhu to loi ho tian-si phai khi
house fall down CST TV broken go

13. a. i ho i e chhu to khi, long bo ka chhap
 he PMS his house fall go all no DISP dispose
 'He let his house fall without doing anything.'

b. *hon-thai ho i e chhu to khi
 typhoon CST his house fall go

Given the four examples above, we can see that when the embedded subject receives a theme role, the sentence will have a permissive interpretation and even an event [-A] subject cannot make it causative.

14. a. hoat-yiⁿ ho a-bin ka chha khi tng khi
 the court of law PMS A-bin DISP car drive back go
 'The court of law allowed A-bin drive his car back.'

b. chia chhiu-a tiaⁿ-tiaⁿ to loai ho a-bin kah chha khi tng khi
 here tree often fall down CST A-bin DISP car drive back go
 'That the trees here often fall down makes A-bin drive his car back.'

15. a. hak-hau ho boai wu-ton e hak-sing lit hio-kun si-kan lau e
 school PMS no like sports of student at rest time stay in
 kau-sek khoaⁿ chu
 classroom read books

'The school allows the students who do not like sports to stay at classrooms to study.'

b. lo toa ho ho chit-koa ai wu-ton e hak-sing lit hio-kun si-kan lau
 fall big rain CST those like sports of student at rest time stay
 e kau-sek khoaⁿ chu
 in classroom read books

'Raining so heavily made those students who like sports stay at classrooms to study.'

As the four examples in (14) and (15) show, when the embedded subject receives an agent role, the property of the matrix subject will determine the meanings. When the matrix subject is [+A], the sentence will be permissive as shown in (14a) and (15a); if the matrix subject is [-A], the sentence will be causative as demonstrated in (14b) and (15b).

Given the discussion above, we find that the sentence will be permissive when the matrix subject is [+A] and the embedded subject receives an agent role or a theme role. With the theme/patient distinction we made, then we can make a generalization: the matrix subject being [+A], the sentence will be permissive when the embedded verb is an action verb, as demonstrated in (12a), (13a), (14a) and (15a) and the sentence will be causative when the embedded verb is a state verb as shown in (7), (8), (9), (10) and (11).

3. Argument Control

As shown in Section 2.2, the semantic alternation of the *ho* construction in Taiwanese depends on the property of the matrix subject and of the

embedded subject. Yet, functional control cannot give a satisfactory account for it since it totally resorts to grammatical functions and structural terms. Hence, we try to determine the control relation in the argument structure.

3.1 The Frame of Argument Control

In argument control, I have stipulated the controller is either a thematic role or an argument structure, e.g. a clausal subject. The same applies to the controllee. The control relation in argument control is determined as follows: the thematic role, taken by a control verb, in the lower position in the hierarchy of the thematic roles controls the highest (or the higher if a verb requires two arguments) thematic role of another verb which will be an embedded verb. And then the regular devices of the mapping theory³, such as the intrinsic role classifications, the default role classifications and the well-formedness condition, can be applied to the argument structure.

In addition, there are two things we have to pay attention to. The first is that verbs like 'to seem' which has a non-thematic subject will, in its argument structure, have an empty slot for this non-thematic subject. The other is that a verb will take a proposition as its argument. In our analysis, a proposition is also represented in the argument structure of the whole sentence as an argument structure. When a verb takes a proposition (or two propositions) and a thematic role as its arguments, we need to determine which of them will be realized as a subject. We propose a hypothesis as follows: if any thematic role in one of the propositions is controlled⁴, then the other proposition will be mapped onto SUBJ; if a verb takes a proposition and a thematic role as its arguments, as long as the thematic role taken by this verb is either a theme role or a patient role, both of which will be mapped onto SUBJ only when the sentence is unaccusative, the proposition will be realized as a subject, that is, the theme role or patient role will be mapped onto OBJ.

3.2 The *HO* Construction Examined in terms of Argument Control

As illustrated in Section 2, the semantic alternation of *ho* is determined by the cooperation of the property of the matrix subject and of the embedded subject. Since in argument control, the control relation is represented in the argument structure, it is feasible to account for the phenomenon in terms of argument control. In this section, we will show how argument control and the mapping theory deal with the phenomenon.

16. a. *ho* 'CAUSE' <ag, th, PROP>
 si bo chong sin chi toe 'to suffer the worst death' <pt>
 be 'to want' <ag, th, PROP>

Argument Structure < ag, th < ag, th < pt > >
 Intr. -o -r (-o) -r (-r)
 Def. -r (-r)

SUBJ OBJ/SUBJ [_{XCOMP} (SUBJ) SUBJ/OBJ [_{XCOMP} (SUBJ/OBJ)]]

W.F. SUBJ OBJ [_{XCOMP} (SUBJ) OBJ [_{XCOMP} (SUBJ)]]

a-bin be ho a-hoa si bo chong sin chi toe
 A-bin want CST A-hoa die no bury body of ground
 'A-bin wants to make A-hoa suffer the worst death.'

b. e 'will' < __, PROP >
 ho 'CAUSE' < PROP, th, PROP >
 si bo chong sin chi toe 'to suffer the worst death' < pt >
 cho 'to do' < ag >

Argument Structure < ____ < < ag > th < pt > >
 Intr. -o -r (-r)
 Def. -r

[_{XOMP} SUBJ] [_{XCOMP} SUBJ/OBJ [_{XCOMP} (SUBJ/OBJ)]]

W.F. < SUBJ > [_{XCOMP} OBJ [_{XCOMP} (SUBJ)]]

a-hoa ane cho e ho i si bo chong sin chi toe
 A-hoa so do will CST he die no bury body of ground
 'That A-hoa does so will make himself suffer the worst death.'

c. Argument Structure < ____ < < th > th < ag > >
 Intr. -r -r (-o)
 Def. (-r)

[_{SCOMP} SUBJ/OBJ] [_{XCOMP} SUBJ/OBJ [_{XCOMP} (SUBJ)]]

W.F. [_{SCOMP} SUBJ] [_{XCOMP} OBJ [_{XCOMP} (SUBJ)]]

? si bo chong sin chi toe e ho i an-e cho
 die not bury body of ground will CST he so do

In (16a), *be* 'to want' is a control verb, *ho* is also a control verb and *si bo chong sin chi toe* 'to suffer the worst death' is treated as a single lexical entry which takes a patient role. *Si bo chong sin chi toe* 'to suffer the worst death' is embedded in *ho*, which is embedded in *be* 'to want' in turn. The lower role of *be* 'to want' controls the higher role of *ho*, whose lower role controls the only role of *si bo chong sin chi toe* 'to suffer the worst death' in turn. The intrinsic

role classifications assign [-o] to the agent role taken by *be* 'to want' and by *ho*, [-r] to the theme role taken by *be* 'to want' and by *ho* and [-r] to the patient role taken by *si bo chong sin chi toe* 'to suffer the worst death'. The default role classifications assign [-r] to the agent role taken by *be* 'to want'. The agent role taken by *be* 'to want' and by *ho* will be mapped onto SUBJ, the theme role taken by *be* 'to want' can be mapped onto either SUBJ or OBJ since it is assigned [-r]. So is the theme role taken by *ho*. The theme role taken by *be* 'to want' will be mapped onto OBJ since the agent role taken by *be* 'to want' has been mapped onto SUBJ. So is the theme role taken by *ho*. The patient role taken by *si bo chong sin chi toe* 'to suffer the worst death' is mapped onto SUBJ based on the subject condition. Then a correct surface representation can be mapped.

In (16b) and (16c), *ho* takes two propositions and a theme role as its arguments. (16c) can be crossed out in semantics because of its wierd meaning. The intrinsic role classifications assign [-o] to the agent role taken by *cho* 'to do', [-r] to the theme role taken by *ho* and to the patient role taken by *si bo chong sin chi toe* 'to suffer the worst death'. The default role classifications assign [-r] to the agent role taken by *cho* 'to do'. The proposition whose main verb is *cho* 'to do' will be realized as SUBJ and the theme role, then, is mapped onto OBJ. The patient role is mapped onto SUBJ based on the subject condition. Then, a correct surface representation can be mapped.

e 'will' is treated as a control verb whose subject is non-thematic in its argument structure, in addition to a proposition, there will be an empty slot for its subject. Whenever there is an empty slot for a non-thematic subject, the empty slot will automatically be the controller. What should be noticed is that the controlee can be either a thematic role, that is an NP, or an argument structure, that is a clause. In (16b), the controlee is an argument structure, which is mapped onto SUBJ of *ho*.

Given the discussion above, we can see that argument control and the mapping theory with some modifications can describe the semantic alternation of the *ho* construction properly. A control verb is lexically specified. To represent the control relation in argument structure, we propose that the lower role of a control verb controls the higher role (or highest role if the verb takes three arguments). If the control verb is a verb taking a non-thematic subject, then the empty slot left in an argument structure will automatically be the controller. If a verb takes thematic roles and propositions as its arguments, then, to determine whether the proposition(s) will be mapped onto SUBJ, we need to consider the position of thematic roles it takes in the hierarchy of the thematic roles: if the verb takes any role other than a patient role or theme role, the thematic role will be mapped onto SUBJ because unmarkedly a theme role or a patient role will not be mapped onto SUBJ unless it is unaccusative (Levin and Hovav 1995: 3). If a verb takes two propositions and a thematic role as its

arguments, both propositions are potentially able to serve as a subject. In this situation, syntax can do nothing about this and which one is a proper subject is determined in semantics by logic or even by world knowledge.

In argument structure, when a verb takes a proposition as its argument, the argument structure of an embedded verb is placed instead of a PROP feature. When the verb takes a non-thematic subject, which means that its subject is not restricted to certain thematic role, an empty slot is left in its argument structure to indicate its non-thematic position.

The embedded argument structure will automatically be mapped onto either a COMP, a clause with a complete structure, or a XCOMP, a clause with its subject unfulfilled depending on whether any thematic role in it is controlled.

4. Conclusion

The essence of argument control includes two parts: the first is that a verb taking a proposition as its argument, in fact, takes an argument structure as its argument; the second is that the control relation can be determined in an argument structure. From the discussion in Section 3, the framework of argument control is explicitly defined and how argument control can account the semantic alternation of *ho* construction in Taiwanese is shown.

Argument control is totally in accordance with LMT in that the syntactic structure can be predicted by mapping from the predicate argument structure of a verb. LMT deals with simple sentences and argument control deals with complicated sentences. These two sets of mechanisms together can account for the sentences in a language well.

Notes

¹ CST is an abbreviation for causative and PMS is an abbreviation for permissive. PST is an abbreviation for a past particle. A disposal morpheme is abbreviated as DISP.

² In this paper, we adopt Chang's (1991: 11) idea that a patient role is distinguished from a theme role. For detailed discussion on the distinction, interested readers are referred to Chang (1991).

³ Since LMT is to deal with the phenomenon in lexicon, if we extend the mapping devices to control structure, then we have to rename it as the mapping theory.

⁴ In fact, both of the two propositions have chance to be the proposition whose thematic role is controlled. After two possibilities are mapped out, semantics will determine which one is more acceptable and crosses out the other.

References

- Bresnan, Joan. 1982. "Control and Complementation." *linguistic Inquiry* 13 (3): 343-434.
- and Jonni M. Kanerva. 1989. "Locative Inversion in Chichewa: A Case Study of Factorization in Grammar." *Linguistic Inquiry* 20 (1): 1-50.
- . 1994. "Locative Inversion and the Architecture of Universal Grammar." *Language* 70 (1): 72-131.
- Chang, Claire Hsun-huei. 1991a. "Thematic Structure and Verb Copying in Mandarin Chinese." *Language Sciences* (13): 399-419.
- . 1991b. "Verb Copying: Toward a Balance between Formalism and Functionalism." *Journal of Chinese Language Teacher's Association* (26): 1-32.
- Cheng, Robert L. 1974. "Causative Constructions in Taiwanese." *Journal of Chinese Linguistics* 2 (3): 279-324.
- Her, One-Soon. 1990. *Grammatical Functions and Verb Subcategorization in Mandarin Chinese*. Taipei: Crane.
- Huang, Hui-ting. 1995. *Lexical Mapping Theory: Mandarin Dative Shift and Locative Inversion*. M.A. Thesis. National Chengchi University.
- Huang, Shuan-fan. 1988. "Remarks on Taiwanese Morphology." *The Structure of Taiwanese: A Modern Synthesis*. Eds. Robert L. Cheng and Shuanfan Huang. Taipei: Crane.
- . 1974. "Mandarin Causatives." *Journal of Chinese Linguistics* 2 (3): 354-369.
- Jackendoff, Ray. 1987. "The Status of Thematic Relations in Linguistic Theory." *Linguistic Inquiry* 19 (3): 369-411.
- . 1990. *Semantic Structure*. Cambridge: MIT.
- Levin, Beth and Malka Rappaort Havov. 1995. *Unaccusativity: at the Syntax-Lexical Semantics Interface*. Cambridge: MIT.
- Li, Charles N. and Sandra A. Thompson. 1981. *Mandarin Chinese: A Functional Reference Grammar*. Berkeley: University of California.
- Palmer, F. R. 1994. *Grammatical Roles and Relations*. Cambridge: Cambridge University.
- Wu, Jiun-Shiung. 1996. *The Semantic Alternations of CAUSE in Taiwanese*. M.A. Thesis. National Chengchi University.