Acquiring Unaccusative Verbs in a Second Language: An L1-Mandarin L2-English Learner Investigation

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Abstract. This study investigates English unaccusative verbs, definiteness, and word order in native Mandarin speakers whose second language is English. The goal of the paper is to see how L1 Mandarin influences speakers' learning of the unaccusative structure in English. I propose two hypotheses. Hypothesis (a) proposes that participants judge raised internal arguments as more acceptable than in-situ internal arguments because both indefinite and definite internal arguments are always allowed to move to a subject position (i.e., raise) in Mandarin. Hypothesis (b) proposes that unaccusative constructions where a definite internal argument remains in situ are less acceptable than those where an indefinite one remains in situ because, in Mandarin, only an indefinite internal argument is allowed to remain in situ. The findings support hypothesis (a) but not (b).

Keywords: Unaccusative verbs · Definiteness · Word order · L2 acquisition

1 Introduction

This study investigates English unaccusative verbs, definiteness, and word order in native Mandarin speakers whose second language is English. The goal of the paper is to see how Mandarin influences speakers' acquisition of the English unaccusative structure.

According to Yuan [1: 279], in Mandarin, if an internal argument in an unaccusative structure is indefinite, it can either move to a subject position, as in (1a), or remain in situ, as in (1b). However, if an internal argument is definite, it must move to a subject position, as in (1c); otherwise, it will be ungrammatical, as in (1d).

(1) Indefinite vs. Definite [1: 279]

(a)上個月，三艘船在這個海域沉了。

shang	ge	yue	,	san	sou	chuan
last	CL	month		**three**	**CL**	**ship**
zai	zhe	ge	hai	yu	chen	le
in	this	CL	sea	area	**sink**	PFV

'Last month, three ships sank in this area of the sea.'
(indefinite & raised)

(b)上個月，在這個海域沉了三艘船。

shang	ge	yue	,	zai	zhe	ge
last	CL	month		in	this	CL
hai	yu	chen	le	san	sou	chuan
sea	area	**sink**	PFV	<u>**three**</u>	<u>**CL**</u>	<u>**ship**</u>

'Last month, three ships sank in this sea area.'
(indefinite & in situ)

(c)上個月，那艘船在這個海域沉了。

shang	ge	yue	,	na	sou	chuan
last	CL	month		**that**	**CL**	**ship**
zai	zhe	ge	hai	yu	chen	le
in	this	CL	sea	are	**sink**	PFV

'Last month, that ship sank in this sea area.'
(definite & raised)

(d)*上個月，在這個海域沉了那艘船。

*shang	ge	yue	,	zai	zhe	ge
last	CL	month		in	this	CL
hai	yu	chen	le	na	sou	chuan
sea	area	**sink**	PFV	**that**	**CL**	**ship**

'Last month, that ship sank in this sea area.'
(definite & in situ)

2   Experiment

The goal of the experiment was to test whether definiteness (indefinite article vs. definite article) and word order (remain in situ vs. raise) influence how native Mandarin speakers learn the accusative structure in English. This section introduces the method.

2.1   Design

The grammaticality judgment task is set up with a 2 × 2 design: definiteness × word order, as shown in Table 1:

There are two types of unaccusative constructions: causative constructions and inchoative constructions. In order to avoid noise, this study focused only on inchoatives. Eight inchoative unaccusative verbs were selected: *break*, *melt*, *boil*, *freeze*, *collapse*, *spill*, *sink*, and *rot*. Thus, eight concrete token sets (32 test sentences in total) were generated. In addition to the test sentences, there were 32 fillers of four types: number agreement, articles, conjunction with transitive verbs, and passives (i.e., 8

Table 1. Definiteness × Word order

Word order	Definitiveness: INDEFINITE	Definiteness: DEFINITE
Raised	(1) Because of the earthquake **a window** **broke**	(2) Because of the earthquake **the window** **broke**.
In situ	(3) *Because of the earthquake **broke a window**.	(4) *Because of the earthquake **broke the window**.

fillers for each condition). In total, four lists were generated, in order to use a Latin square design.

The test sentences and the fillers were pseudo-randomized. For each list, each participant would see 8 test sentences and 32 fillers in a questionnaire. The questionnaire adopted a Likert scale from 1–5, where 5 indicates *definitely agree* (for a perfectly normal sentence which is well-formed and natural sounding) and 1 indicates *definitely disagree* (for a sentence which makes no sense, and is badly formed). Forty sentences were counterbalanced.

2.2 Subject

Twenty-four native Taiwan Mandarin speakers were recruited on-line. A control group of four native English speakers was also recruited.

2.3 Procedure

Subjects received an initial e-mail from the main investigator to make sure they were willing to participate in this study. If they agreed, they were asked to complete a consent form, and then open an Excel file with two sheets: a sheet contained the instructions and personal information survey. The other sheet contained 40 test sentences. After signing the consent form, they read the instructions and filled in their personal information about their age, language background, and linguistics courses taken before. They then read the 40 English sentences (8 test sentences + 32 fillers) without looking up any words in the dictionary, and finished the whole questionnaire without interruption. They then sent both the consent form and Excel file back to the main investigator.

3 Results

The results are summarized in Table 2 and displayed graphically in Fig. 1. First, it appears that participants judged raised internal arguments as more acceptable than in-situ ones, with a mean acceptability of 3.69, 3.77 (in situ) > 2.17, 2.04 (raised). However, items in the definite & raised condition were slightly more acceptable than those in the indefinite & raised condition (mean acceptability 3.77 > 3.69). Second, items in the definite & in situ condition were slightly less acceptable than those in the indefinite & in situ condition (mean acceptability 2.04 < 2.17).

Table 2. Mean scale for Definiteness × Word order for native Mandarin speakers

Word order	Definitiveness: INDEFINITE	Definiteness: DEFINITE
Raised	(1) Because of the earthquake **a window broke** (3.69)	(2) Because of the earthquake **the window** broke. (3.77)
In situ	(3) *Because of the earthquake **broke a window**. (2.17)	(4) *Because of the earthquake **broke the window**. (2.04)
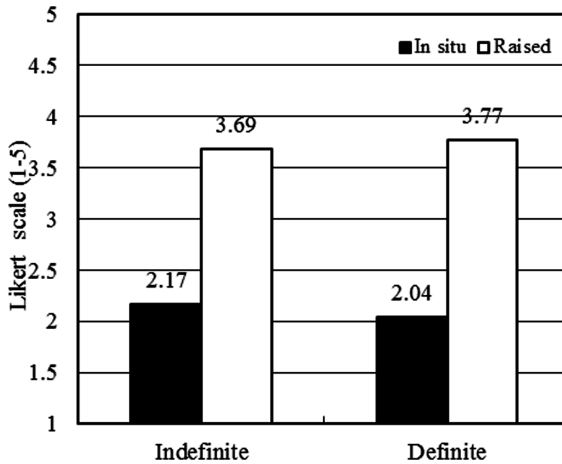
Fig. 1. Acceptability of definiteness and word order in native Mandarin speakers

The main effect of "WORD_ORDER" was highly significant ($x^2 = 54.93$, $df = 2$, $p_{\text{two-tailed}} < 0.001$). Examining both Table 4 and Fig. 1, the main effect of "WORD_ORDER" indicates that the raised condition was more acceptable than the in-situ condition. No other main effect or interaction was found.

Ordinal logistic regression was used because the dependent variable (acceptability Likert scale points) can be treated as 'ordered' levels [2]. The analysis was done using the R package *Design* [3].

The dependent variable was the acceptability data from "SCALE" (from 1 to 5), and the independent variables were word order and definiteness. Two independent variables were nominal. "WORD_ORDER" was "RAISE" for the raised condition, and

Table 3. Ordinal logistic regression: effects and interaction

	χ^2	d.f.	Pr(> F)
DEFINITENESS	0.05	2	0.9753
WORD_ORDER	54.93	2	<0.0001***
DEFINITENESS: WORD_ORDER	0.02	1	0.8914

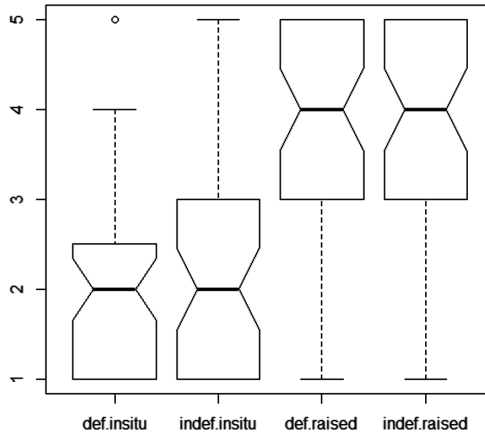'***': $p < .001$, '**': $p < .01$, '*': $p < .05$, '.': $p < .1$

Fig. 2. Definiteness and word order in native English speaker

was "IN_SITU" for the in-situ condition. "DEFINITENESS" was "DEFINITE" for the definite condition, and was "INDEFINITE" for the indefinite condition.

The results are displayed in Table 3 and plotted graphically in Fig. 2.

4 General Discussion and Implications

As mentioned in the introduction, two hypotheses and their possible results were proposed. *Hypothesis (a)* proposed that participants would judge items in the raised condition as more acceptable than those in the in-situ condition. The basis for this hypothesis is that both indefinite and definite internal arguments can raise in Mandarin. *Hypothesis (b)* proposed that a definite internal argument remaining in situ would be less acceptable than an indefinite one. The basis for this hypothesis is that in Mandarin, definite internal arguments must raise; only indefinite internal arguments are allowed to remain in situ.

The empirical results support *hypothesis (a)*. In Mandarin, only indefinite arguments can remain in situ. If this Mandarin unaccusative structure affects how native Mandarin speakers learn English unaccusative verbs, then the results should show that in situ arguments would be less acceptable than raised ones. This asymmetry is indeed borne out in the results.

Nevertheless, since no interaction between "WORD_ORDER" and "DEFINITE-NESS was found, this suggests that the current empirical results did not offer positive evidence to support *hypothesis (b)*.

In order to figure out why the interaction was absent, I also looked at the data obtained from the four native English speakers. The native English speakers also showed a similar pattern, as shown in Table 4 and Fig. 3: the raised condition was more acceptable than the in-situ condition. Note that the number of native Mandarin and English speakers was not equivalent (24 vs. 4), since English speakers simply

Table 4. Mean scale for Definiteness × Word order for native Mandarin speakers

Word order	Definitiveness: INDEFINITE	Definiteness: DEFINITE
Raised	(1) Because of the earthquake **a window broke** (4.50)	(2) Because of the earthquake **the window** broke. (4.83)
In situ	(3) *Because of the earthquake **broke a window**. (2.67)	(4) *Because of the earthquake **broke the window**. (2.17)
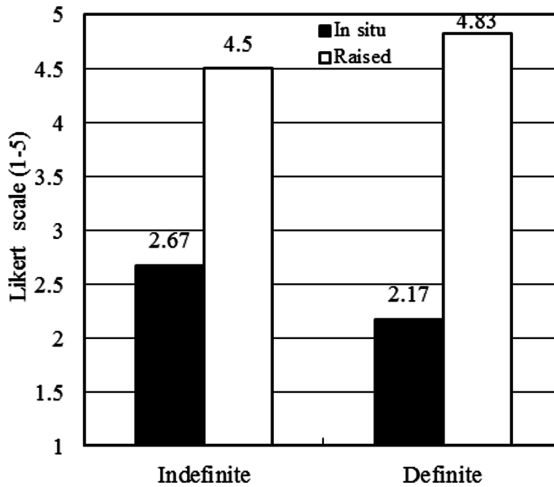
Fig. 3. Acceptability of definiteness and word order in native English speakers

served as a control to confirm that the grammaticality of sentences conformed to native speakers' intuition.

Along the same lines, what does it imply if both native Mandarin and English speakers show similar patterns for English unaccusative verbs, and how do we figure out this puzzle? Further study is needed to see if Mandarin unaccusative verbs also show a similar pattern to native Mandarin speakers. If only native Mandarin speakers show a preference for indefinite & in situ items over definite & in situ items, it suggests that the native Mandarin speakers recruited in this study had actually learned the English unaccusative structure, so they showed the same pattern as the native English speakers. If both English and Mandarin unaccusative structures show no significant interaction between definiteness and word order, it suggests that Yuan [1] 's claim might be wrong. If so, this would further explain why the effect of "DEFINITENESS" was absent in the current study.

One thing to consider in future investigation is that Mandarin does not have a distinction between *a* and *the*; it might therefore be desirable to use non-article ways of showing definiteness (e.g., proper names) in the test sentences. English proficiency might also play a role in the results. L1 Mandarin participants should be classified into

groups based on their proficiency in L2 English. Sample size can also be increased in future work.

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