Chinese Adults' Acquisition of English Contrastive Stress on the Associated Arguments in the Triadic Constructions*

Shu-ing Shyu
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Abstract

In the discussions of focus association (Jackendoff 1972; Rooth 1985, 1992), it is generally agreed that a focus associated with a focus particle, such as *only*, receives a phonologically prominent stress, and that the focus adverb even affects the truth condition of the sentences (Rooth 1985, 1992). Though the acquisition studies have shown that native speakers of non-stress languages may acquire English stress less successfully than the speakers whose L1s have stress systems, the issue of whether or not non-native speakers are sensitive to English stress clues in resolving ambiguities, particularly in the context of association with *only*, is less explored. To empirically examine whether advanced English learners make use of the contrastive stress clue for sentence disambiguation, ninety high-intermediate to advanced learners of English (Mandarin Chinese native speakers) were asked to make value (true/false) judgments on sixteen sentences with either direct object or indirect object focus associated with *only* in response to the context story narrated to the participants prior to the judgment. In addition to the contrastive focus for disambiguation in dative sentence type that has been studied by Halbert et al. (1995), Gennari et al. (2001) and Gualmini et al. (2002), this study included both dative and double object constructions and shows that the participants seemed to resort to the default object focus interpretation, as demonstrated by the results that sentences with the direct object focus were judged significantly more accurately than sentences with the indirect object focus in both types of construction. Consequently, the issue of default focus interpretation with respect to Reinhart's (1995, 2006) interface theory of focus is reexamined.

Keywords: association with focus, contrastive stress, only, focus, triadic construction, focus L2 acquisition

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INTRODUCTION

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Abstract

In the discussions of focus association (Jackendoff 1972; Rooth 1985, 1992), it is generally agreed that a focus associated with a focus particle, such as *only*, receives a phonologically prominent stress, and that the focus adverb even affects the truth condition of the sentences (Rooth 1985, 1992). Though the acquisition studies have shown that native speakers of non-stress languages may acquire English stress less successfully than the speakers whose L1s have stress systems, the issue of whether or not non-native speakers are sensitive to English stress clues in resolving ambiguities, particularly in the context of association with *only*, is less explored. To empirically examine whether advanced English learners make use of the contrastive stress clue for sentence disambiguation, ninety high-intermediate to advanced learners of English (Mandarin Chinese native speakers) were asked to make value (true/false) judgments on sixteen sentences with either direct object or indirect object focus associated with *only* in response to the context story narrated to the participants prior to the judgment. In addition to the contrastive focus for disambiguation in dative sentence type that has been studied by Halbert et al. (1995), Gennari et al. (2001) and Gualmini et al. (2002), this study included both dative and double object constructions and shows that the participants seemed to resort to the default object focus interpretation, as demonstrated by the results that sentences with the direct object focus were judged significantly more accurately than sentences with the indirect object focus in both types of construction. Consequently, the issue of default focus interpretation with respect to Reinhart's (1995, 2006) interface theory of focus is reexamined.

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focus feature F together with its prominent phonological effect, stress, is assigned to the focused element; i.e., the focus association proposed by Jackendoff (1972). The prosodic prominence that interacts with the focus associated with a focus-sensitive particle, such as *only*, has been claimed to affect the semantic interpretation (Rooth 1985, 1992). Consider the widely discussed example in (1), (in Rooth 1985, 1992; Kratzer 1991), which may result in more than three-way ambiguities, depending on the placement of the contrastive stress on the focus argument, marked F, that is associated with *only*: namely, the direct object DO focus in (2a), the indirect object IO focus in (2b), and the VP focus in (2c).

(1) John [$_{VP}$ only [$_{VP}$ introduced Bill to Sue]].[2]

(2) a. John only introduced [Bill]$_F$ to Sue.
b. John only introduced Bill to [Sue]$_F$.
c. John only [introduced Bill to Sue]$_F$.

(3) a. The only person John introduced to Sue is Bill.
b. The only person John introduced Bill to is Sue.
c. The only thing that John did is introducing Bill to Sue.

It has also been noted that *only*, together with the focus associate in its scope (c-commanding domain), modifies the meaning of the larger VP (e.g., Rooth 1985; Krifka 2006); hence, in the context (repeated from Rooth 1985) of (4a), sentence (2a), with the interpretation of (3a), is true, but the utterance of (2b) under such a situation becomes false. Likewise, sentence (2b) is true in the context of (4b), interpreted as (3b), but it becomes infelicitous in the context of (4a). This is due to the fact that in (2b) it was only Sue that John introduced Bill to.

(4) a. John introduced Bill to Sue and Mary.
b. John introduced Bill and Tom to Sue.

[1] 'Only' has scope over (c-commands) its following (lower) VP because the first branching node that dominates 'only', i.e., the adjoined and higher VP, dominates the lower VP, and 'only' does not dominate the lower VP, nor does the lower VP dominate 'only'.
[2] The fourth interpretation is the association of the verb with *only*.

While the correlation between stress and the semantic focus interpretation is generally accepted, empirical studies of the effects of accent on interpretation from children and adults have mixed results. Positive effects of the prosodic information on syntactic structure disambiguation (e.g. Berkovits 1980),[3] and the effects of accent on meaning comprehension or processing have been reported in adults' native language studies, such as processing being facilitated via the words with the predicted accent (e.g., for English speakers in Akker and Cutler 2003), and by means of prosodic prominence (e.g., Speer et al. 1993; and Cutler et al. 1997).[4] Spoken English sentences were interpreted with the help of prosody (Speer et al. 1993). The parallelism between the predicted-accent effect and semantic focus of English adult native speakers was evidenced by Culter and Fodor's (1979) phoneme-monitoring task, in which reaction times to the targets (e.g., the /b/ of blue in (5a)) were shorter when the targets served as the information focus to answer the preceding wh-questions (e.g., (5b)) than the /k/ of *corner* in (5c) in answering (5b).

(5) Target /b/

a. The man on the corner was wearing the blue hat.

b. Which hat was the man wearing?

c. Which man was wearing the hat?

However, one thing that should be noted here in Culter and Fodor's (1979) study is that the monitored sentences (e.g., (5a)) were acoustically identical whichever question was preceded, i.e., (5b) and (5c). Consequently, they claimed that the rapid identification of focused information "should be interpreted by as a search for semantic focus" (p. 49), regardless of the lack of phonetic cues. Their result amounts to saying that the interpretation of semantic focus may not be directly facilitated by prosodic cues.

Despite the positive effect of prosody found in native speakers' sentence processing, prosody does not seem to play the equivalent role in nonnative listeners' processing. While nonnative listeners (of English) are not ignorant of acoustic

[3] In contrast with other studies, Berkovits (1980), however, showed that nonnative (Hebrew) listeners of English L2 used prosodic information to disambiguate syntactic structures.

[4] Speakers of stress languages resort to native stress-assignment principles in making stress judgments in a L2 in which other principles apply (Archibald, 1992, 1993).

prominence (e.g., speakers of tone and pitch-accent languages attending more to pitch change in judging English stress than native listeners do (Watanabe 1988)), Pennington and Ellis (2000) state that prosodic information that encodes the correlation between focus and accent in English functions at a higher levels to a much greater extent than that in Cantonese; namely, prosodic contrasts is mainly operative at the lexical level, at different tones that distinguish different monomorphemic (monosyllabic) words and final particles in Cantonese and Mandarin Chinese (tone languages). And "the tone pattern of a string [in Cantonese] does not provide much information about its internal structure, grammatical constituency, or meaning" (Pennington and Ellis 2000: 374). The difficulty of perceiving the interaction between accent and focus has also been reported by Akker and Cutler's (2003) Dutch users of English, but was not found in native speakers of English. Sennema et al. (2005), confirming Akker and Cutler's (2003) finding, demonstrated that accent did not help their German participants of intermediate-advanced English process the accented word probes more accurately or more efficiently in L2.[5] Moreover, stress distinctions at the word level are difficult to process for non-native speakers, especially with regards to memory retention (stress "deafness" in French L2 learners of English in Dupoux et al. 1997; Korean speakers of learning English L2 in Peperkamp and Dupoux 2002).

In Pennington and Ellis' (2000) study of 30 Cantonese speakers of advanced English in the recognition memory tests for English sentence pairs in which prosody was the distinctive feature, it was shown that their recognition memory of English sentences and memory performance based on prosodic information were generally poor (if without awareness-raising activity). The results led them to conclude that "prosody plays a minimal or diminished role in the processing of the form and meaning of utterances in a L2" (p. 387).

Whether the results of the minimized prosodic effect on L2 processing should be ascribed to L1 transfer (e.g. L1 transfer in all areas of language (Odlin 1989), including phonology (Pennington (in press)) need to be further scrutinized by

[5] In addition to the lack of the significant effect for focus condition, Sennema et al (2005) showed that the position of the word in the S is more important than whether the word is accented or not; namely, words in initial or final position were remembered better. And words under the narrow focus condition tended to be better recognized than words in broad focus condition. Similarly, Barcroft and Vanpatten (1997) reported that L2 listeners attended more readily to the beginning and end of the sentence and that learners show a preference for the sentence beginning.

looking at English children speakers' acquisition of contrastive stress. Although many studies have demonstrated children's mastery of contrastive stress as a marker of focus at a young age (e.g., Hornby 1973; Atkinson-King 1973; Hornby and Hass 1970, etc.), it has also been reported that children do **not** employ contrastive stress to resolve semantic ambiguities (e.g., Chomsky 1971; Tavakolian 1974). Solan's (1980) and McDaniel and Maxfield's (1992) studies of children's interpretation of stress effect on pronouns appears to suggest that contrastive stress, though providing children with helpful clues, is a "language-specific phenomenon" (McDaniel and Maxfield 1992: 341) or may interact with other ad hoc strategies (Solan 1980: 688). Moreover, the universality of contrastive stress in disambiguating contexts is questioned by Gennari et al's (2002) study, which has reported that while adults may have utilized contrastive stress in managing stress in ambiguous ditransitive contexts, children generally used the neutral stress pattern. Similarly, in Gualmini et al's (2002) study, fifteen English-speaking children were asked to judge the truth value (Truth Value judgment (Crain and Thornton 1998)) of sentences in which either the indirect object (IO) (e.g. (6a)) or the direct object (DO) focus (e.g. (6b)) was contrastively stressed. After the story was told to them with the acted-out puppets, in the story ending like (7), the expected answer of IO focus (6a) was false, since Snow White was not the only person that Barney sold a cake to. Likewise, the expected response of (6b) was true since it was only a cake that Barney sold to Snow White.

(6) a. Barney only sold a cake to SNOW WHITE.
b. Barney only sold a CAKE to Snow White.

(7) a. Barney sold a cake to Snow White.
b. Barney sold a cake and a cookie to Winnie.

Gualmini et al's (2002) study, replicating Halbert et al's (1995) findings, showed that children were not able to use prosodic information and contrastive stress

alone to resolve ambiguities (if without a summarized context clue),[6] while adults would successfully utilize prosodic information to disambiguate sentences. This led them to conclude that contrastive stress did not constitute a reliable cue in semantic disambiguation for English-speaking children as old as 5; consequently, prosodic information was not a sufficient source of information for children to interpret the direct object associated with *only*, but discourse manipulation (with context clues) was needed.

Adopting the Value Judgment Task and modifying Halbert et al's (1995), Gennari et al. (2002) and Gualmini et al's (2002) studies to include both dative and double object constructions, Shyu & Kang (2006) and Shyu (2007) have reported that adult speakers of Mandarin (college students) in Taiwan tended not to use contrastive stress to resolve ambiguities in Mandarin "zhi" *only* sentences. In addition, Shyu (2007) concludes that native (Taiwan) Mandarin college students tended to interpret the default direct object focus associated with "zhi" in the triadic constructions.

VP DEFAULT FOCUS RECONSIDERED

The dominant direct object focus reading discussed in Shyu (2007) seems to be incongruent with the default focus interpretation predicted by Reinhart's (1995, 2006) interface theory of focus. Take the examples in (6) for example. Reinhart's theory predicts that since the contrastive focus IO of (8a=6a) coincides with the nuclear stress assigned position, the mostly embedded constituent to which Cinque's (1993) Nuclear Stress Rule assigns the nuclear stress, the IO focus, being unmarked focus, is more readily to be interpreted. Alternatively, seeing that the nuclear stress can further project to its dominating maximal projection VP (e.g. the focus projection in Selkirk 1984), she also predicts that VP wide focus reading is in principle also available. Hence, under the context of (7), the rejection of utterance (8a) is an indication of either

[6] Their study showed that children's judgment improved when there was a summary context clue provided.

interpreting the narrow scope of the "unmarked" nuclear stress on IO or the VP wide focus.

(8) a. Barney only sold a cake to SNOW WHITE.
b. Focus set: {Snow White, sold a cake to Snow White}
c. Nuclear stress (narrow focus): NO (predicted adult answer in context)
d. VP wide focus: NO

(9) a. Barney only sold a CAKE to Snow White.
b. Focus set: {a cake, sold a cake to Snow White}
c. Marked stress (narrow focus): Yes (predicted adult answer in context)
d. VP wide focus: NO

In contrast, when the contrastive stress falls on the DO in the dative sentence (9a) and since the DO does not sit in the position that receives the sentence main (nuclear) stress, it is a marked stress, which cannot undergo focus projection (Selkirk 1984; Göbbel 2001). Due to the economy consideration, Reinhart proposes that the interpretation of the marked stress (DO focus) is more costly, thus less favored; whereas the VP wide scope serves as a more economical alternative. Take the case of (7) for an example. The acceptance of the utterance of (9a) is a manifestation of narrow DO focus reading; whereas the rejection of (9a) reveals the VP wide focus interpretation.

In the studies of Gennari et al. (2001) and Gualmini et al. (2002), their native English speaking children successfully rejected target sentences similar to pattern (8a) with ratios of 97.5% and 87%, respectively. Their success in rejecting sentences like (8a), as well as the 84.8% of accurate rejection rate supplied by Szendrői's (2003) results from twenty-three Dutch children, might be ascribed to either their accurate IO narrow focus reading or their default VP wide focus reading, as predicted by Reinhart. However, the former contrastive stress reading was not likely to be obtained, since the children in these three studies did not judge

DO narrow focus so successfully (36.5%, 35%, 52.2%, respectively). Furthermore, based on the follow-up answers from the Dutch children of her study, Szendrői reported that the non-adult like group consistently rejected the target sentences in terms of utilizing the default VP focus reading. Consequently, her result supports Reinhart's interface theory of focus in the consideration of economy of derivation. The results of previous studies are summarized in Table 1.

Table 1. A Summary of Previous Studies

	Indirect object focus (reject the target Ss)	**Direct object focus (accept the target Ss)**	**Sentence Type**
Gennari et al. (2001)	97.5%	36.5% (92% of adults')	English Dative
Gualmini et al. (2002)[7]	87% (vs. 100% of adults')	35% (97% of adults') 86% (with a context summary)	English Dative
Szendrői (2003)	84.8%	52.2%	Dutch Dative
S&K (2006) & Shyu (2007)	26%, 47%	67%, 84%	Mandarin Dative
	29%, 18%	87%, 78%	Mandarin DOC

In contrast, in Shyu's (2007) discussion of Shyu and Kang's (2006) (S&K) study, she has pointed out that the adult Taiwan Mandarin speakers' overall successful DO focus correct responses vs. poor IO focus responses in both dative and double object constructions suggested that on one hand the participants were insensitive to contrastive stress in resolving ambiguities, and on the other hand, they tended to interpret targets as the default direct object focus. Namely, the targets of either (8a) or (9a), like (10), were uniformly correct in the context of (7a); with regard to Snow White, it is true that Barney only sold her a cake. Likewise, sentence (11), regardless of having the contrastive stress on either the DO or IO, was less acceptable, since for Winnie, he bought both a cake and a cookie. In other words, with respect to the recipient per se, there was only one object that s/he should receive, when interpreting Mandarin "zhi" sentences, and

[7] The children tested in Gennari et al's (2001) and Gualmini et al's (2002) were the same group, so the similar accurate rates are self explanatory (Gualmini, p.c. 2007).

other participants in the context tended to be ignored.

(10) Barney only sold a cake to Snow White.

(11) Barney only sold a cookie to Winnie.

Consequently, the DO focus reading reported in S&K, though not conforming to Reinhar't predicted default VP wide focus reading, was ascribed by Shyu (2007) to two reasons: Mandarin speakers did not incline to utilize contrastive stress in resolving ambiguities, and the DO argument is readily focused or extracted in comparison with the prohibition of IO extraposition in various constructions that express focus in Mandarin.

As mentioned in section 1, although prosody may facilitate sentence interpretation for adult native speakers, non-native speakers and native speaking children did not seem to achieve the same mastery as adult native speakers did. Particularly, adult Mandarin speakers, reported by Shyu (2007), did not utilize contrastive stress to disambiguate argument focus associated with Mandarin "zhi". Given the fact that stress does not surface as a primary feature to lexically distinguish words in Mandarin, a tonal language, it is worthy to investigate whether Mandarin adults in learning L2 English can successfully acquire the contrastive stress to disambiguate the *only* associated argument in both dative and double object constructions, like native English adult speakers did, as reported in Gualmini et al. (2002). Consequently, this study reduplicates S&K and Shyu's (2006) experiment design, except that English stories were used in this study.

THE EXPERIMENT

Subjects

Ninety Taiwan Mandarin speaker undergraduate students participated in this study: forty-seven students from Chinese department and forty-three students from the English department at National Sun Yat-sen University in Kaohsiung.[8] The experiment was conducted in their class hours in three separate classes: English for English-major freshmen, Introduction to Linguistics for English-major sophomores, and Introduction to Linguistics for Chinese majors. Their English proficiency was based on their English aptitude examination scores. All the English majors' scores were ranked at the top 25% of the scores of the nationwide graduating high schoolers who took the examination in that year, and only two Chinese majors' scores were ranked about average, 50%, and seven of the Chinese majors' scores were missing. Even though it seemed that their English proficiency did not differ too strongly, based on the scores examination, it is still reasonable to ask if different majors contribute a factor to our study.

Method

Materials and Design

This study adopted the Truth Value Judgment Task (Crain and Thornton 1998), and adapted from Gualmini et al's (2002) study, in whose design for testing children, puppets were used to perform a play, and another different puppet spoke the pre-recorded target sentence at the end of the play to elicit judgments according to the story ending. If the puppet spoke correctly, the children were asked to give him a reward. Since we were testing EFL adults in this study, we designed sixteen

[8] The English version was first run to the English majors, and Chinese majors performed this English experiment two weeks after Shyu and Kang's Mandarin version had been tested. There were twenty-nine Chinese majors in total who did Mandarin version experiment preceding the English version. The interval of two weeks was meant to minimize the order effect.

stories, which were shown on a projector using a PowerPoint file containing a set of (3~5) pictures for each story embedded with sound-recorded narrations. After each story was shown and narrated, the screen became blank for a second and afterwards the target sentence was played. The participants had five seconds to check true or false answer in their questionnaires. All the voice files were recorded and played with Gold Wave software in advance to maintain consistent sound quality.

Recording

The stories and tested sentences were recorded by a female voice in an acoustically shielded room, and were digitalized with a DaT-recorder at 16bit/44, 1kKz sampling rate with Gold Wave software version 5.12. In order to ensure that the non-native subjects fully understand the stories, the narrator[9] was asked to speak a little more slowly than her normal speed, and the stress on the tested sentences was exaggerated a little, since the purpose of this study aimed to test subjects' interpretation of the stress, rather than their awareness of stress. See the Appendix for some pitch samples.

Target Sentences

The target sentences consisted of two sentence types: Dative (shift/alternation) Construction (Dative), from sentences (S-1) through (S-8), and Double Object Construction (DOC), from sentences (S-9) through (S-16). The verbs used in this study included: *send* (Ss-6, 8, 9), *sell* (Ss-2, 4, 14), *bring* (Ss-3, 11, 16), *throw* (Ss-5, 10), *lend* (Ss-7, 15), *pass* (S-12), and *give* (Ss-1, 13). The stories were played in a random order. Among the eight sentences of each construction, they were further divided into two separate pairs: one set with a summary clue immediately preceding the tested statement and the other set without it. For each set of the four sentences, the contrastive stress fell on the indirect object (IO) (with

[9] The narrator is a Mandarin and English bilingual, who received her education in the United States.

one expected true and one expected false answer) or on the direct object (DO) (with one expected true and one false answer). Table 2 (for Dative) and Table 3 (for DOC) respectively summarize each story ending (Row-2), the tested sentences (R-3) without a summary clue, expected answer (R-4), tested sentences provided with a summary sentence (R-5) and their respective expected responses (R-6). The sentence structures and intended stress in R-5 are parallel with those in R-3, except with a difference in an extra summary clue immediately preceding the tested sentence. The same pattern applies to Table 3 with the DOC sentences. The stressed words were marked in capitals.

The context issue was addressed in Gualmini et al's (2002) study, and it was shown that children's judgments improved when a summary statement preceding the tested sentence was provided. Hence, our current study includes sentences with an added summary and without the summary to see if a summary statement facilitates disambiguation.

Table 2. Dative Sentences

	Stress on IO	**Stress on IO**	**Stress on DO**	**Stress on DO**
Row-2: Story ending	The tutor gave Flora a pen, John a book and a pen.	Snow White bought a cake, and Pooh bear a cake and a cookie.	Piglet brought bread to Snow White, and Goofy bread and butter.	Mickey bought a candy, and Minnie bought a candy and a cookie.
Row-3:Tested sentence without a summary clue	(S-1) The tutor only gave a book to JOHN.	(S-2) Barney only sold a cake to SNOW WHITE.	(S-3) Piglet only gave the BREAD to Snow White.	(S-4) Goofy only sold a COOKIE to Minnie.
Row-4: Expected Responses	True	False	True	False
Row-5: Tested (underlined) sentence with a summary clue	(S-5) So Dolphin had a fish and a boat, Penguin had a fish, but Tarzan only threw a boat to DOLPHIN.	(S-6) Winnie sent a book and a card to Tigger, but he only sent a card to PIGLET.	(S-7) Goofy had a basketball and a jumping rope, but Cinderella only lent a BASKETBALL to Minnie.	(S-8) Therefore, Mickey got Harry Potter's phone message and e-mail, and Little Mermaid got an email. Harry Potter only sent a MESSAGE to Mickey.
Row-6: Expected Responses	True	False	True	False

Table 3. Double Object Construction (DOC) Sentences

	Stress on IO	**Stress on IO**	**Stress on DO**	**Stress on DO**
Row-2: Story ending	Snow White had a rose, and Minnie had a rose and a bird.	Michael threw Jimmy a Frisbee, and Danny a Frisbee and a doll.	Minnie brought Goofy a flower, and Mickey a flower and a cake.	Donald passed Tigger a piece of paper, and Snow White a piece of paper and a pencil.
Row-3:Tested sentences without a summary clue	(S-9) Donald Duck only sent MINNIE a bird.	(S-10) Michael only threw JIMMY a Frisbee.	(S-11) Minnie only brought Goofy a FLOWER.	(S-12) Donald Duck only passed Snow White a PENCIL.
Row-4: Expected Responses	True	False	True	False
Row-5: Tested (underlined) sentence with a summary clue	(S-13) Now Winnie has a car, and Piglet has a car and a house. But the genie only gave PIGLET a house.	(S-14) Mickey has a hamburger and a glass of milk, but the owner only sold GOOFY a hamburger.	(S-15) Mickey has a bag and a camera, but Donald Duck only lent Snow White a BAG.	(S-16) Finally Winnie the Pooh has an alarm clock, and Minnie gets a watch and an alarm clock. But Goofy only bought Minnie a WATCH.
Row-6: Expected Ans.	True	False	True	False

Stories

Following the story structure in Gualmini et al. (2002), we designed the stories in a way that each story involved three characters, including a giver and two recipients, and two objects for the giver to give out. At the end of each story, one recipient (A) received only one object and the other (B) received two objects, one of which was of the same type of object that A got. The wording of each story was limited to one hundred and fifty words. The story structure is tabulated in (12), and the intended responses and their respective contexts are summarized in (13).

(12) Story Structure:

Recipient A	Recipient B
Object 1	Object 1
Ø	Object 2

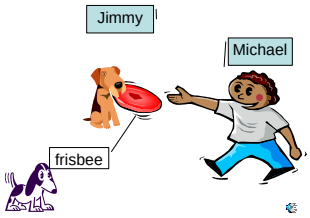
(13) The schema of the stories:

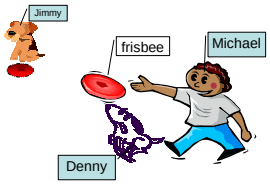
Type	True/False	Context	Sentences
1	True for IO focus	Recipient **B** (stressed) received object 2	1, 5, 9, 13
2	False for IO focus	recipient **A** (stressed) received object 1	2, 6, 10, 14
3	True for DO focus	recipient A received object **1** (stressed)	3, 7, 11, 15
4	False for DO focus	recipient **B** received object 2 (stressed)	4, 8, 12, 16

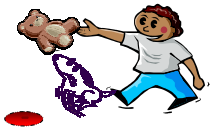
To illustrate, story 10 is repeated and the pictures corresponding to the story are shown below.

(Story 10) *Michael is playing with his dogs Jimmy and Denny, who like to chase after any object that their owner Michael throws at them. After Michael throws Jimmy a Frisbee, he throws another one to Denny. They both catch their Frisbee successfully. Michael sees Denny waiting to play another game, so he throws him a doll. While Michael is thinking of throwing a ball to Jimmy, he sees Jimmy is busy playing with the Frisbee that he just got. So Michael keeps the ball to himself, without throwing it to Jimmy.*

Pictures for story 10

1. 

2. 

3. 

4. 

(S-10) Michael only threw JIMMY a Frisbee.

At the end of the story, Jimmy (recipient A) received a Frisbee and Denny (recipient B) a Frisbee and a doll. And sentence (S-10) with IO *Jimmy* focus is supposed to be false, since Jimmy was not the only one that received the Frisbee. This pattern corresponds to tested sentences 2, 6, and 14, the infelicity of which was due to the fact that it is not only recipient B that receives object 2, corresponding to type 2 in (13).

In contrast, the intended true context for IO focus occurred when recipient B (stressed) received object 2 (corresponding to type 1 (Ss 1, 5, 9, and 13) in (13)), since B was the only person who received object 2. Type 3 was intended to be a true context for DO focus (i.e. sentences 3, 7, 11, and 15), which was obtained when it was only object 1 (stressed) that recipient A received. And its intended false counterpart was rendered when it was only object 2 (stressed) that B received (i.e. sentences 4, 8, 12, 16, type 4 in (13)).

Procedure and Judgments

The randomized stories (with pictures) and their corresponding tested sentences were presented by automatically announced Gold Wave sound files embedded in a Powerpoint file. After the story, there was a blank slide with one second pause; followed by the target sentence announcement, preceded by a ring sound to signal the upcoming sentence to be judged. The subjects were asked to mark true as "O", or false as "X", or a "not sure" judgment for each sentence based on the ending of each story. There were only five seconds of interval time for the participants to respond. The whole procedure including filling out the background information took approximately 25 minutes.

Scoring

"1" was coded for the correct responses, and "0" for the wrong responses, as well as "not sure". There were total 32 (2%) "not sure" responses. The scores were recorded in an SPSS Data Editor file using the SPSS statistics software for Windows (version 11.5) under one variable of major specification (e.g. "1" for Chinese majors and "2" for English majors), and sixteen variables for each sentence type.

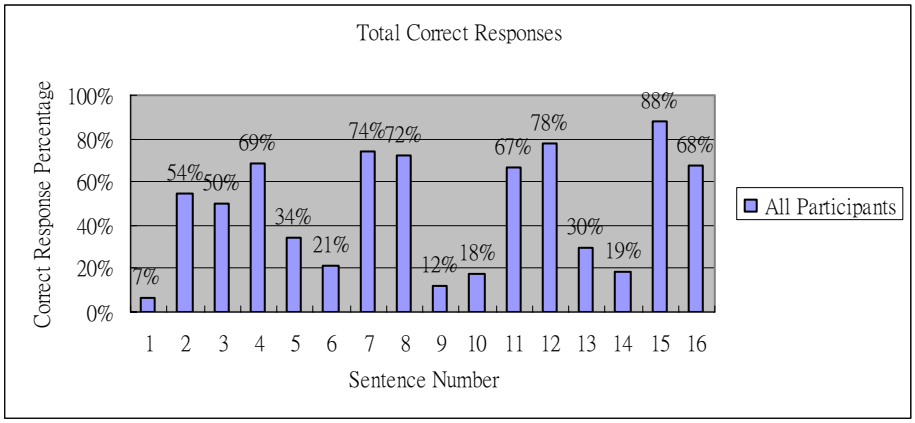
RESULTS AND DISCUSSION

Sentence Judgments

The correct responses of the 90 participants are tabulated in Figure 1, and those of different majors are compared in Figure 2. It would appear that the difference of major does not surface significantly, since Chinese majors performed significantly better than English majors only in sentence 10, and English majors did significantly better than Chinese majors only in sentences 9, 12, and 15 ($p< 0.01$). This result is not surprising, given the fact that Chinese

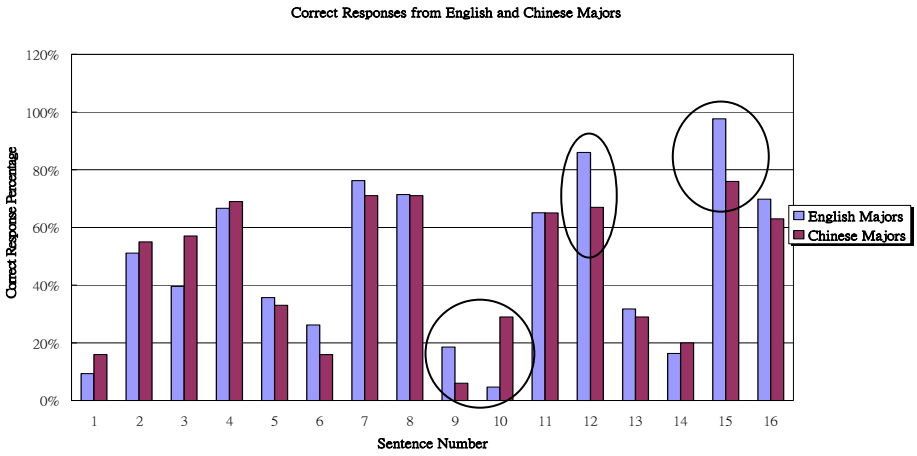
majors' mean score (12.02) of the English Aptitude Examination did not differ too much from that (14.27) of the English majors'. Henceforth, no further major difference will be addressed.

Figure 1. Total Accurate Responses (in %)



Among the double object sentences (DOC) (sentences 9~16), there appeared a uniform tendency: direct object focus (11, 12, 15, 16) being judged better than indirect object focus (9, 10, 13, 14) with t = -14.319 at the significance level $p < .000$ of the paired sample *t*-test result. Similarly, among Dative sentences the accurate rates of judging DO focus (sentences 3, 4, 7, 8) were significantly higher than those of their IO counterparts (i.e. sentences 1, 2, 5, 6) ($t = -8.721$ and $p < .000$), except only for sentence 2. In other words, the participants performed better at judging DO focus than at judging IO focus for both Dative and DOC types. This amounts to saying that the Mandarin EFL learners tended not to sense the ambiguity of the tested sentences under the contexts provided, but interpret them as the surface value.

Figure 2. Accurate Responses of English and Chinese Majors (in %)



Context Effect?

According to Gualmini et al's (2002) second experiment of children's responses to direct object associates, they found that children's (with the total number of 15) judgments improved (51/59 tokens, 86%) when the tested sentences were provided with a summary to contrast with, in contrast to their responses without the summary (35%) in their first trials. This finding, thus, led them to conclude the contextual effect on resolving ambiguity. In contrast, Shyu's (2007) study showed that the context clue did not seem to facilitate disambiguation by native speakers of Mandarin. The sentences without a summary clue (S1) and with a summary clue (S5) are repeated below; see the contrast between Row-3 and Row-5 in Tables 1 and 2.

(S1) The tutor only gave a book to JOHN.

(S5) Summary: So Dolphin had a fish and a boat, Penguin had a fish.
Target sentence: But Tarzan only threw a boat to DOLPHIN.

The paired sample tests, used to the context variable and shown in Table 4, demonstrate mixed results. While five out of eight pairs (pairs 1, 2, 3, 5 and 7)

show significant differences, the second pair (DATIVE 2 & 6), as well as pair 8, in contrast with other pairs, show a contrary and unexpected result: sentence 2, without a context summary, being judged better than sentence 6, with a context summary. Therefore, we might tentatively conclude that the contextual information might not be a strong indicator of contributing to the disambiguation judgment in the current study.[10] Hence, for the following discussion, we combine the same sentence types without further differentiating the context clue factor.

Table 4. The Paired Samples Test of the Sentence Provided with vs. without a Summary of the Story

Pairs	Sentences	*t*	Sig.(2-tailed)
Pair 1	DATIVE1 - DATIVE5	-4.563	**.000***
Pair 2	DATIVE2 - DATIVE6	5.638	.000*
Pair 3	DATIVE3 - DATIVE7	-3.137	**.002***
Pair 4	DATIVE4 - DATIVE8	-.844	.401
Pair 5	DOC9 - DOC13	-3.484	**.001***
Pair 6	DOC10 - DOC14	-.207	.836
Pair 7	DOC11 - DOC15	-3.780	**.000***
Pair 8	DOC12 - DOC16	1.533	.129

* $p < .01$

Correlation

The same sentence types were combined to show how IO focus and DO focus may correlate with one another and if their responses are reliable or not. The results of the Person Correlation test among the eight sentence types were shown in Table 5. There are nine cells among twenty-eight cells that show significant correlations: positive correlations between the same type focus, such as IO focus-IO focus (1&5-9&13; 2&6-9&13), and DO focus-DO focus (3&7-11&15; 4&8-12&16). Negative correlations occurred between IO focus

[10] Ying (1996) showed that nonnative listeners (of various language backgrounds) paid greater attention to contextual than to prosodic cues to the same structure. For the issues of context effects on disambiguation, I refer readers to her and Su's studies (2004).

and DO focus (1&5-4&8; 2&6-3&7; 2&6-4&8; 4&8-10&14; 9&13-12&16). These results seem to suggest that there may exist a tendency to some extent that when IO focus is judged incorrectly, DO focus tends to be judged correctly, as the negative correlations indicate.

The cells that showed significant correlations in this current study are fewer than (the 18 cells) that the Mandarin experiment reported in S&K (2006) and Shyu's (2007) study, despite that a similar tendency is observed here. We might ascribe the fewer correlations to the indeterminacy of the participants. The EFL speakers probably could not confidently process the information (judging the sentences based on the story and the contrastive stress) given to them in a foreign language.

Table 5. Pearson Correlation test among DO and IO foci in Dative Construction (DATIVE) and Double Object Construction (DOC)

	DATIVE 1&5 IO focus	DATIVE 2 & 6 IO focus	DATIVE 3&7 DO focus	DATIVE 4&8 DO focus	DOC 9& 13 IO focus	DOC 10&14 IO focus	DOC 11&15 DO focus	DOC 12&16 DO focus
DATIVE 1 & 5	1							
DATIVE 2 & 6	.057	1						
DATIVE 3 & 7	-.170	**-.380(**)**	1					
DATIVE 4 & 8	**-.247(*)**	**-.301(**)**	.179	1				
DOC 9 & 13	**.273(**)**	**.208(*)**	-.162	-.180	1			
DOC 10 & 14	.015	.081	.106	**-.330(**)**	.187	1		
DOC 11 & 15	-.167	-.151	**.280(**)**	.050	-.108	-.153	1	
DOC 12 & 16	-.090	-.170	-.028	**.398(**)**	**-.208(*)**	-.150	.019	1

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

N in each cell = 90

Discussion

As mentioned in sections 1 and 2, on one hand it has been reported that children (of English and Dutch) did not use contrastive stress to resolve semantic ambiguities in language comprehension (Solan, 1980; McDaniel et al., 1992; Halbert et al. 1995; Gualmini et al., 2002; Szendrói 2003). Moreover, focus that

coincides with nuclear stress and the default VP focus interpretations in *only* sentences seem to be preferred, as reported by Szendrói (2003), and Gennari el al's (2001) in support of Reinhart's theory. On the other hand, it was reported by S&K (2006) and Shyu (2007) that adult Mandarin native speakers tended not to utilize contrastive stress to resolve ambiguity in Mandarin sentences containing *zhi*. Table 6 summarizes and compares our current results and previous studies. Like the results of Mandarin native speakers', the Mandarin EFL College students tended to interpret DO focus more successfully than interpreting IO focus.

Table 6. A Comparison with Previous Studies

	Indirect object focus (reject the target Ss)	**Direct object focus (accept the target Ss)**	**Sentence Type**
1.Gennari et al. (2001)	97.5%	36.5% (92% of adults')	English Dative
2.Gualmini et al. (2002)	87% (vs. 100% of adults')	--35% (97% of adults') --86%	English Dative
3.Szendrői (2003) children	84.8%	52.2%	Dutch Dative
4.S&K (2006) & Shyu (2007) Adult Mandarin speakers	26%, 47%	67%, 84%	Mandarin Dative
	29%, 18%	87%, 78%	Mandarin DOC
5. Our result Adult EFL Ss	**21%, 38%**	**61%, 69%**	English Dative
	21%, 18%	**76 %, 72%**	English DOC

The most straightforward explanation of our result is first language influence. The insensitivity to contrastive stress in resolving disambiguation was transferred from their L1 interpretation to that in English L2. And the default reading tended to fall on the direct object focus, instead of the nuclear stress focus or the VP focus as stated by Reinhart. Shyu (2007) ascribes the DO default reading to the asymmetric extraction properties of the internal arguments of the di-transitive predicates in Mandarin (e.g. Li 1990). Namely, it has been observed by Li (1990) that only direct object can be passivized (instances of NP-movement as in (14)) or relativized/topicalized (*wh*-movement as in (15)), but indirect object extraction is prohibited in such structures.

(14) NP-movement (Li 1990: 85 (3))

a. Shu bei wo song gei ta le. --DO
book by me give to them Asp

b. *Wo bei ta song gei shu le --*IO
I by him give to book Asp

(15) *Wh*-movement (Li 1990: 85 (4))

a. Zhei jiushi [[wo song (gei) tamen] de shu] --DO
this is I send to them DE book
"This is the book that I sent (to) them."

b. **Zhe jiushi [[wo song shu] de nage ren]. --*IO
this is I send book DE that man

Similarly, the direct object serving as the focus element is much preferred over the indirect object counterpart in the pseudo-cleft sentences; as given by the contrast between (37a) and (37b).

(16) Pseudo-cleft (Shyu 2007))

a. [[wo song (gei) tamen] de ∅] shi Hong Lou Meng] --DO
I give to them DE BE Red Chamber Dream
"What I gave to them is Red Chamber Dream (a novel)."

b.?*[[wo song gei (ta) Hong Lou Meng] de nage ren] shi Zhangsan] --*IO
I give to (him) Red Chamber Dream DE that man BE Zhangsan
"The person that I gave Red Chamber Dream to is Zhangsan."

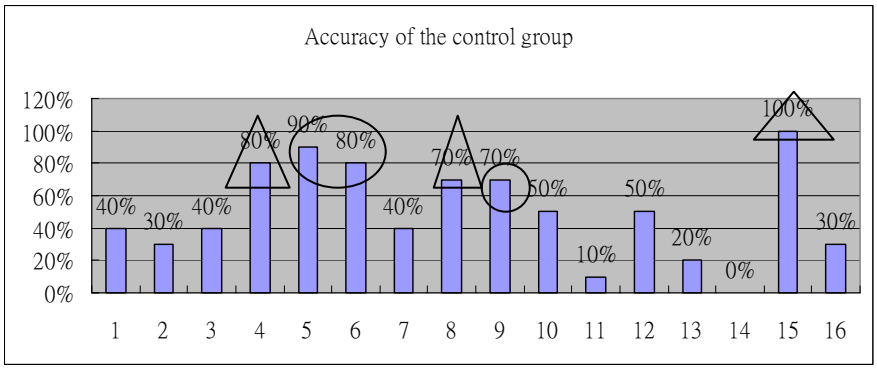
This parallelism with respect to direct object extraction seems to suggest that the direct object is more "prominent", in the sense that it is readily to be focused and evidenced in the above Mandarin syntactic structures. The extracted direct object may express the attention of focus or contrast in the typical pseudo-cleft example (16a), as well as the relative head noun in the affirmative sentence of (15a). Furthermore, the topicalized DO in (14a) can be contrastively expressed. If this observation is on the right track, the Mandarin EFL adults may utilize the similar venue to interpret the internal arguments in the triadic constructions.

Control Group

Even though it is reported in Gulamini et al. (2002) and Gennari et al. (2001) that adult native English speakers could successfully utilize contrastive stress to resolve ambiguity, Gennari et al. in their first experiment to adult native English speakers showed that when the contrastive stress fell on the sentence nuclear (main) stress (e.g., the IO in their dative sentences), their participants felt more hesitant about the ambiguity between the narrow IO focus or the VP focus. Thus, it seems that there still exists variability among native speakers' judgments.[11] For the purpose of presenting a control group in our current study, ten native speakers of English (from the USA and Canada) were asked to perform the experiment and their responses are tabulated in Figure 3. It seems that the native speakers' responses did not show a perfect and consistent pattern. Overall dative sentences (47/80 accurate responses) were judged better than DOC sentences (33/80 accurate responses). Among the six sentences that more than half of the participants responded correctly, four belong to the dative sentences (the DO focus in Ss 4 and 8, and the IO focus in Ss 5 and 6); and only one IO focus sentence (S 9) and one DO focus sentence (S 15) are of the DOC type. It seemed that the IO focus was responded in dative sentences (Ss1, 2, 5, 6) better than that in DOC sentence (Ss 9, 10, 13, 14), which may suggest that the IO focus in dative, being coincided with the neutral stress, was interpreted less costly, in contrast to that in DOC, in conformity with Reinhart's prediction. However, the question of whether English speakers could interpret the (default) DO focus in DOC as easily as the (default) IO focus in dative can not be answered at this moment, due to the limited number of subjects. Due to the variability in the native speakers' results, studies that incorporate more native speakers' responses are needed to verify if native speakers could disambiguate relevant sentences as successfully as what Gulamini el al. have reported from their adult speakers, and whether there indeed exist differences between native speakers and non-native speakers.

[11] I owe the judgments to Professor Michael Toolan.

Figure 3: Accurate Responses of the Control Group (in %; N=10)



Limitations of the Study

One limitation may come from the short time span for judging and the fact that no picture was shown to the participants when making their judgments. Although each story was accompanied with three to five pictures shown by the Power Point file, with an interval of one second and after a short ring sound, the participants had only five seconds to judge with no pictures. It was designed so in order that they could concentrate on the oral statement, instead of judging the sentence by viewing the pictures. However, one potential problem of this design might occur due to the short-term memory; namely, the participants might not be able to recall the story ending when making the judgments. In order to compensate for this potential problem, the pictures were used to illustrate the stories and the last picture or each story normally served as a summary.

One may ask of the need for fillers in this experiment. In consideration of finishing the total sixteen stories in one sitting, we did not provide filler examples for the fear that the subjects might not be able to concentrate for more than twenty-five minutes. Also, it was suggested that a pretest should be run in order to ensure the subjects were able to perceive contrastive stress.[12] This point may be justifiable since the speaker was asked to pronounce the foci with extra emphasis, even to an extent that they were thought to be too exaggerated. Many participants laughed when they heard such exaggeration and some even wrote their comments

[12] I owe this comment to Bi-lan Yang.

in the questionnaire to ask us to produce more "natural" utterances.[13]

CONCLUSION

This study has empirically shown that Mandarin speakers of EFL learners did not seem to employ contrastive stress to resolve ambiguous focus readings in *only* triadic sentences regardless of either dative or double object constructions. Rather, they tended to resort to the default direct object focus reading, as well as ignore the other contrasted individual (IO focus), which did not conform with the more unmarked (neutral) focus or the default VP focus readings predicted by Reinhart's interface theory of focus. Consequently, it is suggested that this default DO focus reading may be influenced by participants' L1, in which direct object, theme role, is extractable in various syntactic constructions related to expressing attention of (contrastive) focus. The direct object may be more "prominent" and be easily associated with *only* at the interpretive level. More research is called for to further investigate the different patterns in tonal languages and non-tonal languages.

[13] Another suggestion made by some participants of the English native speakers was to provide a model example before starting the experiment. We acknowledge the limitation of the current design.

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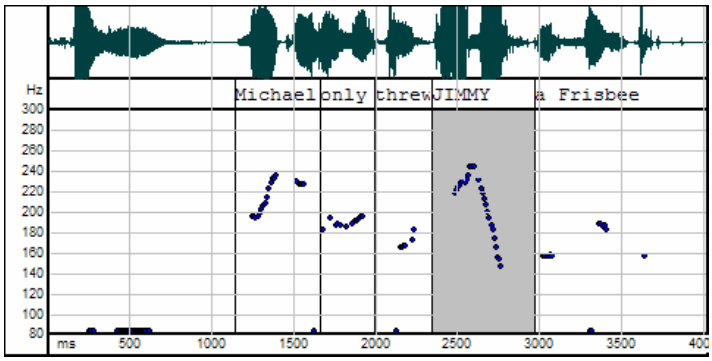
Appendix

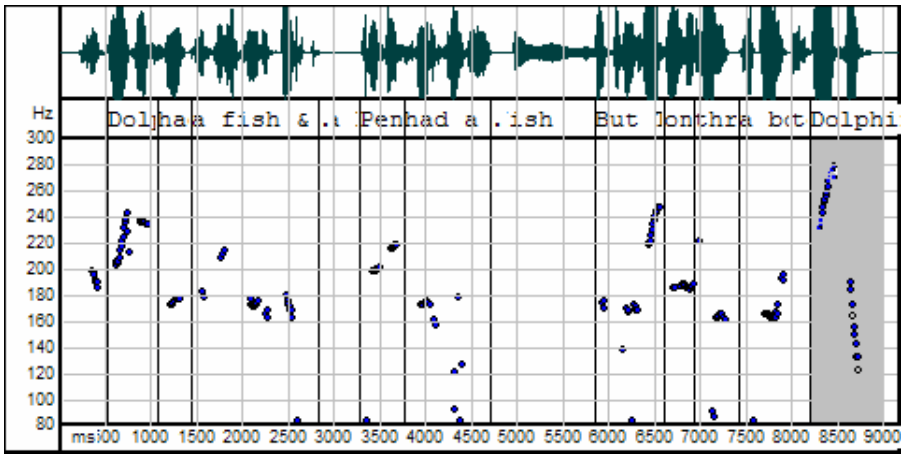
IO focus in double object sentence

(S-10) Michael only threw JIMMY a Frisbee.



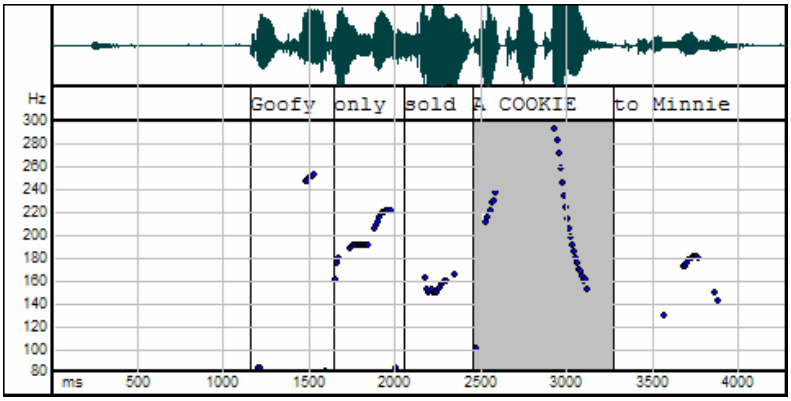
IO focus in dative sentence:

(S-5) … Tarzan only threw a boat to DOLPHIN.



DO focus in dative sentence:

(S-4): Goofy only sold a COOKIE to Minnie.



DO focus in double object sentence:

(S-12) Donald Duck only passed Snow White a PENCIL.